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FIGURE 6-1 DRAWING

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PRELIMINARY DESIGN REPORT
FOR THE
GROUNDWATER REMEDIAL ACTION

REVISION 0

CRAB ORCHARD NATIONAL WILDLIFE REFUGE
PCB OPERABLE UNIT - SITES 32/33
MARION, ILLINOIS

PREPARED BY
RMT, INC.
MADISON, WISCONSIN

May 2001

VOLUME 2 OF 2

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Appendix A
Geoprobe® Boring Log Forms

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-100 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.3 Completion Depth 24.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/12/00 Finish 9/12/00

UTM (or State Plane) Coord. N.(X) 371402.6 E.(Y) 787413.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL: G - K. Baker; D - G. Swift; H - R. Hoin; H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	CONCRETE			A		0		NA		
426.3			1							
425.3	**LEAN CLAY (CL),** 10%-20% silt, trace fine sand, plastic to non-plastic, 10YR 6/1 gray mottled with 7.5YR 5/6 strong brown, no odor, moist, medium stiff to stiff.		2	B		45	0.5 to 1.5	NA	<1	
424.3			3							
423.3	Same as above, 10YR 5/4 yellow brown, stiff to very stiff.		4	C		100	1.2 to 2.2	NA	<1	
422.3			5							
421.3	Same as above.		6	D		100	1.7 to 2.2	NA	<1	
420.3	**SILT (ML),** gray, very soft.		7							
	LEAN CLAY (CL), as at 0.5 feet, 10YR 5/4 yellow brown.									
419.3	Same as above, medium stiff to stiff.		8	E		83	0.5 to 1.5	NA	<1	
418.3			9							Trace fine gravel in QC sample E/F.
417.3	Same as above.		10	F		100	0.7 to 1.5	NA	<1	Duplicate FDUP32/33-001-000912 collected.

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson Boring No: SB-100 Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge Surface Elevation: 427.3 Completion Depth: 24.0

Fed ID. No: _____ Auger Depth: _____ Rotary Depth: _____

Quadrangle: NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date Start: 9/12/00 Finish: 9/12/00

UTM (or State Plane) Coord. N (X): 371402.6 E (Y): 787413.4

Latitude: ___ ° ___ ' ___ " Longitude: ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
415.3	Same as above, mottled 10YR 5/4 yellow brown with 10YR 6/1 gray.		12	G		100	0.7 to 2.0	NA	<1	
414.3			13							
413.3	Same as above, stiff.		14	H		100	1.5	NA	<1	
412.3			15							
411.3	Same as above, medium stiff.		16	I		83	0.5	NA	<1	
410.3	very soft, wet zone, approximately 8" thick at 17' bgs.		17							
409.3	Same as above, medium stiff to stiff.		18	J		100	0.5 to 1.2	NA	<1	
408.3			19							
407.3	Same as above.		20	K		100	<0.5	NA	12	
	SILTY SAND (SM), 20%-40% silt, non-plastic, no odor, moist, very soft.									
406.3	LEAN CLAY (CL), 20%-40% silt, trace fine sand, plastic to non-plastic, 10YR 5/6 yellow brown, no odor, moist.		21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-100 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.3 Completion Depth 24.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/12/00 Finish 9/12/00

UTM (or State Plane) Coord. N.(X) 371402.6 E.(Y) 787413.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	1.0 to 1.5	NA	175	
404.3			23							
	Cobble at 23.5' bgs.									
403.3	**End of Boring at 24 feet.** (Refusal)		24							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-101 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.5 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371457.7 E.(Y) 787406.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, plastic to non-plastic, 10YR 5/4 yellow brown mottled with 10YR 6/1 gray, no odor, moist, very stiff.			A		83	3.0 to 3.5	NA	<1	
425.5			1							
424.5	Same as above, very stiff to hard.		2	B		88	2.7 to 4.5	NA	<1	
423.5			3							
422.5	Same as above, stiff to very stiff.		4	C		100	1.7 to 3.5	NA	<1	
421.5			5							
420.5	Same as above, stiff.		6	D		100	1.2 to 1.5	NA	<1	
419.5			7							
418.5	Same as above, medium stiff to very stiff.		8	E		100	0.8 to 2.2	NA	<1	
417.5			9							
416.5	Same as above, stiff.		10	F		100	1.2 to 1.7	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-101 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.5 Completion Depth 28.0

Fed. ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371457.7 E (Y) 787406.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.5	Same as above, medium stiff to stiff.		12	G		100	0.7 to 1.7	NA	<1	Trace fine gravel in QC sample G/H.
413.5			13							
412.5	Same as above, medium stiff to very stiff.		14	H		100	0.5 to 2.7	NA	<1	
411.5			15							
410.5	Same as above.		16	I		100	0.5 to 2.2	NA	<1	
409.5			17							
408.5	**SILTY SAND (SM)**, 20%-30% silt, non-plastic, 2.5Y 6/6 olive yellow, no odor, wet.		18	J		100	0.5 to 1.4	NA	<1	
407.5	**LEAN CLAY (CL)**, as above, mottled, medium stiff to stiff.		19							
406.5	**SILTY SAND (SM)**, as at 18' to 18.6' interval above.		20	K		100	0.5	NA	<1	
405.5			21							
	LEAN CLAY (CL), more uniform color, 10YR 5/4 yellow brown, medium stiff. (Till)									

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-101 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.5 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5' T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371457.7 E.(Y) 787406.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	0.5 to 1.0	NA	<1	
403.5			23							
402.5	Same as above, 5% to 10% angular gravel, trace to 10% fine sand, very stiff.		24	M		92	2.2 to 3.7	NA	<1	
401.5			25							
400.5	Same as above, medium stiff to very stiff.		26	N		92	0.5 to 2.7	NA	<1	
399.5			27							
398.5	**End of Boring at 28 feet.**		28							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-102 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 30.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/12/00 Finish 9/12/00

UTM (or State Plane) Coord. N.(X) 371349.4 E.(Y) 787470.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, 10YR 5/6 yellowish brown, some mottling, no odor, dry, hard. (Fill)			A		100	>4.5	NA	<1	
425.7			1							
424.7	Same as above, very stiff.		2	B		100	2.5	NA	<1	
423.7			3							
422.7	Same as above, but less silt (10%-20%), trace gravel, moderately plastic, 7.5YR 5/6 strong brown, some mottling, no odor, slightly wet, very stiff.		4	C		96	2.0 to 2.5	NA	<1	
421.7			5							
420.7	Same as above, medium stiff to stiff.		6	D		96	0.5 to 1.5	NA	<1	
419.7			7							
418.7	**LEAN CLAY (CL),** as above, but less silt (5%-10%), no gravel, medium to high plasticity, 10YR 5/4 yellow brown, some mottling with depth (gray), no odor, slightly wet, stiff to very stiff. (Native)		8	E		92	1.5 to 2.5	NA	25	
417.7			9							
416.7			10	F		92	1.5 to 2.5	NA	38	Duplicate FDUP32/33-002-000912 collected.

(950226)

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No: SB-102 — Monitor Well No. _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 426.7 — Completion Depth: 30.0

Fed ID No. _____ — Auger Depth _____ — Rotary Depth _____

Quadrangle: NE 1/4 of NW 1/4 — Sec. 5 — T 10 S — R 2 E — Date Start: 9/12/00 — Finish: 9/12/00

UTM (or State Plane) Coord N.(X): 371349.4 — E (Y): 787470.0

Latitude ___ ° ___ ' ___ " — Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL:
G - T. Silverman
D - J. Pilsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.7	Same as above, grey mottling is prevalent. 10YR 5/6 yellow brown, stiff.		12	G		100	1.0	NA	27	
413.7			13							
412.7	Same as above, becomes more dense with depth, very stiff.		14	H		100	2.5 to 3.0	NA	6	
411.7			15							
410.7	Same as above, soft.		16	I		100	0.25 to 0.5	NA	30	
409.7	CLAYEY SAND WITH SILT (SC-SM), poorly graded sand, 10YR 5/6 yellow brown, wet.		17							
408.7	LEAN CLAY (CL), 10% silt, trace fine gravel, low to medium plasticity, 10YR 5/4 yellow brown, slightly wet, stiff (Till)		18	J		100	1.5	NA	30	
407.7			19							
406.7	Same as above, but with 5%-10% gravel, medium stiff to very stiff.		20	K		100	0.5 to 2.5	NA	54	
405.7			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-102 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 30.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/12/00 Finish 9/12/00

UTM (or State Plane) Coord. N.(X) 371349.4 E.(Y) 787470.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Gravel pocket from 22' to 22.8' bgs.			L		100	1.5 to 3.5	NA	53	
403.7			23							
402.7	Same as above, but only trace gravel, little mottling, very stiff.		24	M		100	2.25 to 2.75	NA	12	
401.7			25							
400.7	Same as above.		26	N		100	2.5 to 2.75	NA	14	
399.7			27							
398.7	Same as above.		28	O		NR	2.0 to 3.0	NA	18	
397.7	Pocket of silty sand with clay from 29.0' to 29.2'.		29							
396.7	**End of Boring at 30 feet.** (Refusal)		30							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-103 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.2 Completion Depth 31.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/12/00 Finish 9/12/00

UTM (or State Plane) Coord. N.(X) 371395.3 E.(Y) 787458.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-20% silt, trace fine sand, plastic to non-plastic, 10YR 5/4 yellow brown, no odor, moist, very stiff. (Fill)			A		92	2.2	NA	<1	
425.2			1							
424.2	Same as above, very stiff.		2	B		100	2.0	NA	<1	
423.2			3							
422.2	Same as above.		4	C		67	2.0	NA	<1	Trace fine gravel in QC sample C/D (Fill)
421.2			5							
420.2	Same as above, contains a 3" zone of gray lean clay 5Y 5/1, stiff.		6	D		75	1.0 to 2.0	NA	<1	
419.2			7							
418.2	Same as above (10YR 5/4 yellow brown).		8	E		100	0.5 to 2.0	NA	<1	Trace fine gravel in QC sample E/F (Fill)
417.2			9							
416.2	Same as above, soft to stiff.		10	F		92	0.5 to 1.0	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-103 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.2 Completion Depth 31.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date: Start 9/12/00 Finish 9/12/00

UTM (or State Plane) Coord. N.(X) 371395.3 E (Y) 787458.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.2	LEAN CLAY (CL), as above, soft to stiff. (Native)		12	G		100	0.5 to 2.0	NA	<1	No gravel in QC sample G/H (Native)
413.2			13							
412.2	Same as above, containes a 1.0' zone of 2.5Y 6.1 gray, very soft to very stiff.		14	H		100	0.2 to 2.5	NA	<1	
411.2			15							
410.2	Same as above (10YR 5/4 yellow brown), stiff.		16	I		100	1.0 to 2.0	NA	<1	
409.2			17							
408.2	Same as above, stiff.		18	J		83	1.5	NA	<1	
407.2			19							
406.2	Same as above, soft to very stiff.		20	K		100	0.5 to 2.5	NA	<1	
405.2			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-103 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.2 Completion Depth 31.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/12/00 Finish 9/12/00

UTM (or State Plane) Coord. N.(X) 371395.3 E.(Y) 787458.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	0.5 to 3.0	NA	<1	
403.2			23							
402.2	**SILTY SAND (SM),** 20%-30% silt, non-plastic, 10YR 5/4 yellow brown, no odor, wet, very soft.		24	M		67	<0.5	NA	<1	
401.2			25							
400.2	**LEAN CLAY (CL),** 20%-30% silt, trace fine sand, trace fine gravel, plastic to non-plastic, 10YR 5/6 yellow brown, some minor 10YR 5/1 gray areas, no odor, moist, stiff to very stiff. (Till)		26	N		100	1.0 to 3.5	NA	<1	
399.2			27							
398.2	Same as above, very stiff.		28	O		75	3.0	NA	<1	
397.2			29							
396.2	Same as above.		30	P		92	2.5	NA	<1	
395.2	**End of Boring at 31 feet.**		31							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-104 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.2 Completion Depth 29.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371367.9 E.(Y) 787488.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, 10YR 5/4 yellow brown, slightly mottled, no odor, dry, very stiff to hard. (Fill)			A		100	2.75 to 4.0	NA	<1	
425.2			1							
424.2	Same as above, but stiff and slightly wet from 3.5' to 4' bgs.		2	B		100	0.75 to 3.0	NA	<1	
423.2			3							
422.2	Same as above, but trace gravel, dry, hard from 4' to 4.5' bgs.		4	C		92	2.0 to 4.0	NA	7	
421.2			5							
420.2	Same as above, but stiff, pocket of wet, very plastic clay and silt from 7.5' to 7.8' bgs.		6	D		92	1.0 to 2.0	NA	18	
419.2			7							
418.2	**LEAN CLAY (CL)**, as above, moderately wet, stiff. (Native)		8	E		88	1.0 to 2.0	NA	149	
417.2			9							
416.2	Same as above.		10	F		88	1.0	NA	113	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-104 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.2 Completion Depth 29.5

Fed ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371367.9 E (Y) 787488.4

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	silty clay with sand (SC-SM) seam from 11.5' to 11.8' bgs.									
414.2	Same as above, but with more gray mottling.		12	G		100	1.0 to 1.25	NA	75	
413.2			13							
412.2	Same as above, medium stiff to stiff.		14	H		100	0.5 to 1.0	NA	74	
411.2			15							
	Pocket of silty clay with sand from 15.5' to 16' bgs.									
410.2	Same as above, but little mottling, stiff.		16	I		100	1.5	NA	104	
409.2			17							
408.2	Same as above, very wet between 18' and 18.5' bgs, very stiff from 19.5' to 20' bgs.		18	J		100	0.5 to 3.0	NA	65	
407.2			19							
406.2	LEAN CLAY (CL), as above, stiff to very stiff. (Till)		20	K		100	1.75 to 2.75	NA	22	
405.2			21							
	5%-10% fine gravel between 21.5' and 22.5'.									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-104 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.2 Completion Depth 29.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371367.9 E.(Y) 787488.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff to very stiff.			L		100	1.75 to 3.0	NA	11	
403.2			23							
402.2	Same as above, very stiff.		24	M		92	2.5 to 3.0	NA	12	
401.2			25							
400.2	Same as above, medium stiff to stiff.		26	N		92	0.5 to 2.0	NA	2	
399.2			27							
398.2	**SILTY SAND (SM)**, fine sand, 20% silt, 10YR 5/4 yellow brown, no odor, moderatley wet.		28	O		100	2.5 to 3.5	NA	11	
	LEAN CLAY (CL), as at 26' bgs.									
	SILTY SAND (SM), medium to coarse sand, 20% silt, 10YR 5/4 yellow brown, no odor, wet, loose.									
397.2	**LEAN CLAY (CL)**, 10%-20% silt, as at 26' bgs.		29							
	End of Boring at 29.5 feet. (Refusal)									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-105 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.0 Completion Depth 31.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/12/00 Finish 9/12/00

UTM (or State Plane) Coord. N.(X) 371419.0 E.(Y) 787454.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), pockets of silt (10%-20%), trace fine sand, medium to high plasticity, 10YR 5/2 grayish brown, mottled, no odor, slightly wet, stiff.			A		100	1.5	NA	1.1	
425.0			1							
424.0	Same as above, very stiff.		2	B		100	3.5	NA	1.1	
423.0			3							
422.0	Same as above, but less silt (<10%), high plasticity, 10YR 5/3 brown, slightly wet, medium stiff.		4	C		100	0.75	NA	1.1	
421.0			5							
420.0	Same as above, medium plasticity, stiff.		6	D		100	1.5	NA	1.1	
419.0			7							
418.0	Same as above, but 5%-10% silt, trace fine gravel, plastic, 10YR 5/4 yellow brown, mottled, slightly wet, medium stiff.		8	E		100	0.75	NA	1.1	
417.0			9							
416.0	Same as above, very stiff.		10	F		100	2.75	NA	2.3	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-105 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.0 Completion Depth 31.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date: Start 9/12/00 Finish 9/12/00

UTM (or State Plane) Coord. N.(X) 371419.0 E (Y) 787454.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.0	Same as above, but high plasticity, stiff.		12	G		100	1.0	NA	1.1	
413.0			13							
412.0	Same as above, low to medium plasticity, slight mottling, very stiff.		14	H		100	2.5	NA	1.1	
411.0			15							
410.0	Same as above, stiff.		16	I		100	1.5	NA	1.1	
409.0			17							
408.0	LEAN CLAY (CL), as above, 10%-15% gravel, wet. (Till)		18	J		100	1.5	NA	1.1	
407.0			19							
406.0	Same as above, very stiff.		20	K		100	2.5 to 3.25	NA	1.1	
405.0			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-105 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.0 Completion Depth 31.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/12/00 Finish 9/12/00

UTM (or State Plane) Coord. N.(X) 371419.0 E.(Y) 787454.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff to very stiff.			L		100	1.5 to 2.5	NA	1.1	
403.0			23							
402.0	Same as above, trace gravel, very stiff.		24	M		100	2.5 to 3.5	NA	1.1	
401.0			25							
400.0	Same as above.		26	N		100	2.5	NA	1.1	
399.0			27							
398.0	Same as above.		28	O		NR	2.0 to 2.5	NA	1.1	
397.0			29							
396.0	Same as above.		30	P		NR	3.25	NA	1.1	
395.0	**End of Boring at 31 feet.** (Refusal)		31							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-106 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.6 Completion Depth 29.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371346.1 E.(Y) 787517.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, plastic to non-plastic, mottled 10YR 5/4 yellow brown with 10YR 6/1 gray, no odor, moist, stiff. (Fill)			A		75	1.2 to 1.5	NA	<1	
424.6			1							
423.6	Same as above, very stiff. (Fill)		2	B		96	2.0 to 3.5	NA	<1	
422.6			3							
421.6	3" zone of gray to dark gray 10YR 4/1 at 3.6' bgs. Same as above, mottled clay, stiff to hard. (Fill)		4	C		79	1.5 to 4.5	NA	<1	
420.6	**SILTY GRAVEL (GM)**, 5% sand, 5%silt, non-plastic, 10YR 4/1 dark gray, no odor, dry, stiff to hard. (Fill)		5							
419.6			6	D		67	0.5 to 4.2	NA	<1	
418.6			7							
	LEAN CLAY (CL), as at 0' to 2' interval, wet, very soft. (Native)									
417.6	Same as above, stiff to very stiff.		8	E		88	1.7 to 2.5	NA	<1	
416.6			9							
415.6	Same as above.		10	F		100	1.3 to 2.5	NA	5	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-106 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.6 Completion Depth 29.5

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371346.1 E (Y) 787517.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
413.6	Same as above, medium stiff to stiff.		12	G		100	0.7 to 1.5	NA	2	
412.6			13							
411.6	Same as above, stiff to very stiff.		14	H		88	1.2 to 3.0	NA	16	
410.6			15							
409.6	Same as above, stiff.		16	I		54	1.2 to 1.5	NA	48	
408.6			17							
407.6	Same as above, medium stiff to very stiff.		18	J		58	0.7 to 3.0	NA	95	
406.6			19							
	LEAN CLAY (CL), 6" zone of 30% fine sand at 19.3' bgs.									
405.6	LEAN CLAY (CL), same as above at 18', stiff to hard.		20	K		100	1.5 to 4.5	NA	26	
404.6			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-106 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.6 Completion Depth 29.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371346.1 E.(Y) 787517.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), as above, trace fine gravel, contains a 2" zone of black staining, no odor, no significantly elevated PID readings, very stiff to hard. (Till)			L		100	2.2 to 4.5	NA	19	
402.6			23							
401.6	Same as above, but more uniform color (less mottled), 10YR 5/4 yellow brown, very stiff.		24	M		100	2.5 to 3.2	NA	<1	
400.6			25							
399.6	Same as above.		26	N		100	2.2 to 3.7	NA	<1	
398.6			27							
397.6	Same as above, stiff.		28	O		67	1.2	NA	<1	
396.6	**SANDSTONE,** weathered, fine sand, angular, 20% clay, 10GY 7/1 light greenish gray and 2.5Y 7/6 yellow.		29							
	End of Boring at 29.5 feet. (Refusal)									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-107 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.3 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 371390.1 E.(Y) 787517.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, 10YR 5/3 brown, no odor, dry, very stiff. (Fill)			A		100	2.5 to 3.5	NA	<1	
425.3			1							
424.3	Same as above.		2	B		100	2.0 to 3.0	NA	<1	
423.3	**LEAN CLAY (CL)**, as above, 10%-20% silt, trace fine sand, 2.5Y 6/3 light yellowish brown, very stiff. (Native)		3							
422.3	Same as above, but alternating 10YR 5/6 yellowish brown and 2.5Y 5/3 light olive brown.		4	C		100	2.0 to 3.0	NA	<1	
421.3			5							
420.3	Same as above, but increasing plasticity below 6' bgs, mostly 10YR 5/6 yellowish brown with grey/olive mottling, stiff.		6	D		100	1.25 to 1.75	NA	<1	
419.3			7							
418.3	Same as above, medium plasticity, 10YR 5/4 yellow brown with grey/olive mottling, moderately wet, medium stiff.		8	E		100	0.5 to 1.0	NA	<1	
417.3			9							
416.3	Same as above, stiff to very stiff.		10	F		100	1.0 to 2.25	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-107 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.3 Completion Depth 28.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord N (X) 371390.1 E (Y) 787517.5

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.3	Same as above, trace gravel (<1%), mottling and black stains, stiff.		12	G		100	1.0	NA	<1	
413.3			13							
412.3	Same as above, stiff.		14	H		100	1.0 to 1.5	NA	<1	
411.3			15							
410.3	Same as above.		16	I		100	1.0 to 2.0	NA	<1	
409.3			17							
408.3	Same as above, stiff and dry from 19.2' to 20' bgs.		18	J		100	1.5 to 2.5	NA	<1	
407.3			19							
406.3	LEAN CLAY (CL), as above, trace gravel, no mottling, soft to medium stiff. (Till)		20	K		100	0.25 to 0.75	NA	<1	
405.3			21							
	Zone of 10%-20% gravel and some mottling between 21.5' and 22.5' bgs.									

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-107 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.3 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 371390.1 E.(Y) 787517.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff to very stiff.			L		100	1.5 to 3.5	NA	<1	
403.3			23							
402.3	Same as above.		24	M		100	1.5 to 2.5	NA	<1	
401.3			25							
400.3	Same as above.		26	N		100	1.5 to 2.5	NA	<1	
399.3			27							
398.3	**End of Boring at 28 feet.**		28							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-108 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.2 Completion Depth 27.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371347.3 E.(Y) 787579.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-30% silt, trace fine sand, plastic to non-plastic, mottled 10YR 5/4 yellow brown with 10YR 6/1 gray, moist, medium stiff to stiff. (Fill)			A		88	0.5 to 1.7	NA	<1	
425.2			1							
424.2	Same as above, stiff.		2	B		92	1.2 to 1.7	NA	<1	
423.2			3							
422.2	Same as above.		4	C		92	1.0 to 1.7	NA	<1	Trace fine gravel in QC sample C/D (Fill)
421.2			5							
420.2	Contains a 6" zone of 2.5Y 5/2 gray-brown at 5.8' bgs. Same as above, soft.		6	D		88	0 to 0.5	NA	<1	
419.2			7							
418.2	Same as above, but 2.5Y 4/1 dark gray, with 25% angular gravel, stiff.		8	E		38	1.0 to 2.7	NA	<1	
417.2			9							
416.2	**LEAN CLAY (CL)**, as above (mottled clay), stiff. (Native)		10	F		42	1.0 to 1.2	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson Boring No: SB-108 Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge Surface Elevation: 426.2 Completion Depth: 27.5

Fed ID No: _____ Auger Depth: _____ Rotary Depth: _____

Quadrangle: NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371347.3 E.(Y) 787579.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.2	Same as above, stiff to very stiff.		12	G		100	1.4 to 2.8	NA	<1	
413.2			13							
412.2	Same as above, trace very fine gravel, medium stiff to stiff.		14	H		100	0.7 to 1.5	NA	<1	
411.2			15							
410.2	Same as above, no gravel, stiff.		16	I		92	1.0 to 1.7	NA	<1	
409.2	Light gray zone at 16.8' to 17.3' bgs.		17							
408.2	Same as above, medium stiff to stiff.		18	J		100	0.8 to 1.8	NA	<1	
407.2			19							
406.2	LEAN CLAY (CL), as above, trace fine gravel, uniform color and texture, very soft to soft. (Till)		20	K		83	<0.5	NA	<1	
405.2			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-108 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.2 Completion Depth 27.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371347.3 E.(Y) 787579.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, very soft to stiff. <5% gravel near base of interval.			L		92	<0.5 to 2.0	NA	<1	
403.2			23							
402.2	Same as above, stiff to very stiff.		24	M		100	1.4 to 3.1	NA	<1	
401.2			25							
400.2	1" sandy zone at 25.9' to 26.0' bgs. Same as above, but more uniform color, 10YR 5/4 yellow brown, trace vertical fractures (gray), very stiff to hard.		26	N		100	2.8 to 4.5	NA	<1	
399.2			27							
	End of Boring at 27.5 feet. (Refusal)									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-109 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.4 Completion Depth 26.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 371503.8 E.(Y) 787636.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, 10YR 5/3 brown, no odor, dry. (Fill)			A		67	NA	NA	<1	
425.4	Medium to coarse gravel from 1' to 3' bgs.		1							
424.4			2	B		67	1.0 to 1.5	NA	<1	
423.4	**ORGANIC SOIL (OL),** clay with 20%-30% silt, low to moderate plasticity, 5Y 4/1 dark gray, moderately wet, medium stiff to stiff. (Fill)		3							
422.4			4	C		100	0.5 to 1.0	NA	<1	
421.4	**LEAN CLAY (CL),** 10%-20% silt, trace fine sand, low to medium plasticity, 2.5Y 5/3 light olive brown, no odor, dry, medium stiff. (Native)		5							
420.4	Same as above, but below 6' bgs color changes to 10YR 5/6 yellowish brown with 2.5Y 5/3 light olive brown, some black staining, stiff to very stiff.		6	D		100	1.5 to 2.25	NA	<1	
419.4			7							
418.4	Same as above, medium plasticity.		8	E		96	2.0 to 2.25	NA	<1	
417.4			9							
416.4	Same as above.		10	F		96	1.0 to 2.5	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No.		County: Williamson	Boring No: SB-109
Site File Name	Crab Orchard National Wildlife Refuge	Surface Elevation	426.4
Fed ID No.		Auger Depth	
Quadrangle	NE 1/4 of NW 1/4	Sec. 5 T. 10 S R. 2 E	Date Start 9/15/00
Monitor Well No		Completion Depth	26.0
Rotary Depth		Finish	9/15/00

UTM (or State Plane) Coord. N.(X) 371503.8 E.(Y) 787636.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.4	Same as above, color changes to mainly 10YR 6/6 brownish yellow with some 2.5Y 5/3 light olive brown and black staining, moderately wet.		12	G		100	1.0 to 2.5	NA	<1	
413.4			13							
412.4	Same as above, stiff.		14	H		100	1.0 to 1.5	NA	<1	
411.4			15							
410.4	Same as above, wet, soft.		16	I		96	0.5	NA	<1	Trace fine gravel in QC sample I/J (Till).
409.4			17							
408.4	LEAN CLAY (CL), as above, plastic, primarily 2.5Y 5/4 light olive brown between 18' and 19.5' bgs, stiff. (Till)		18	J		96	1.0 to 1.5	NA	<1	
407.4			19							
406.4	Same as above, color is mostly 10YR 5/6 yellow brown.		20	K		100	1.0 to 1.25	NA	<1	
405.4			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-109 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.4 Completion Depth 26.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 371503.8 E.(Y) 787636.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, trace gravel between 22' and 23' bgs, medium stiff.			L		100	0.5 to 1.0	NA	<1	
403.4			23							
402.4	Same as above.		24	M		100	1.0 to 3.0	NA	<1	
401.4	Same as above, 5%-10% gravel, uniform, chunks of gray sandstone, 10YR 5/4 yellow brown, stiff to very stiff.		25							
400.4	**End of Boring at 26 feet.** (Refusal) (Gray weathered sandstone)		26							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-110 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.4 Completion Depth 24.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371600.8 E.(Y) 787336.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, non-plastic, 10YR 5/4 yellow brown, no odor, dry, stiff. (Fill)			A		96	1.5	NA	<1	
425.4	**GRAVELLY SILT (ML),** (Fill)		1							
424.4	**LEAN CLAY (CL),** 10%-20% silt, trace fine sand, low plasticity, 10YR 5/3 brown, no odor, dry, very stiff. (Native)		2	B		96	2.5	NA	<1	
423.4			3							
422.4	Same as above, but 10YR 5/4 yellow brown with mottling, very stiff.		4	C		100	2.5	NA	<1	
421.4			5							
420.4	Same as above, stiff.		6	D		100	1.5 to 2.0	NA	<1	
419.4			7							
418.4	Same as above, but moderately plastic, moderatley wet below 9' bgs, very stiff.		8	E		100	2.5 to 3.0	NA	<1	
417.4			9							
416.4	Same as above.		10	F		100	2.0 to 2.5	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-110 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.4 Completion Depth 24.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N (X) 371600.8 E (Y) 787336.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.4	Same as above, stiff.		12	G		100	1.5	NA	<1	Trace very fine gravel in QC sample G/H.
413.4			13							
412.4	Same as above, medium stiff to stiff.		14	H		100	0.5 to 1.5	NA	<1	
411.4			15							
410.4	Same as above.		16	I		100	0.5 to 1.5	NA	<1	Duplicate FDUP32/33-003-000913 collected.
409.4			17							
408.4	SILTY SAND (SM), fine sand, 30%-40% silt, 10YR 5/6 yellow brown, no odor, wet, soft.		18	J		100	0.5	NA	<1	
407.4			19							
406.4	LEAN CLAY (CL), 30% silt, <10% sand, moderately plastic, 10YR 5/6 yellow brown, no odor, wet, soft.		20	K		NR	<0.5	NA	<1	
405.4			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-110 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.4 Completion Depth 24.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371600.8 E.(Y) 787336.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but 10%-20% silt, 10YR 5/4 yellow brown, moderately wet, very stiff.			L		NR	2.0 to 2.5	NA	<1	
403.4			23							
402.4	**End of Boring at 24 feet.**		24							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-111 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.6 Completion Depth 24.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371692.4 E.(Y) 787438.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, non-plastic, 10YR 5/3 brown, no odor, dry, stiff to very stiff.			A		100	2.0 to 3.0	NA	<1	
424.6			1							
423.6	Same as above, low plasticity.		2	B		100	1.75 to 2.25	NA	<1	
422.6			3							
421.6	Same as above, but medium mottled, stiff.		4	C		92	1.0	NA	<1	
420.6			5							
419.6	Same as above, but moderately wet at 8' bgs.		6	D		92	1.0	NA	<1	
418.6			7							
417.6	Same as above, less silt (10%-20%), mottling increases with depth, moderately wet.		8	E		92	1.0 to 1.5	NA	<1	
416.6			9							
415.6	Same as above, color change to 10YR 5/4 yellow brown, very mottled, very stiff.		10	F		92	2.0 to 2.5	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-111 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.6 Completion Depth 24.0

Fed. ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371692.4 E (Y) 787438.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
413.6	Same as above, but 10YR 5/6 yellow brown, wet, medium stiff to very stiff.		12	G		100	0.5 to 2.5	NA	<1	
412.6			13							
411.6	Same as above, medium stiff.		14	H		100	0.5 to 1.0	NA	<1	
410.6			15							
409.6	Same as above, stiff.		16	I		100	1.0 to 2.0	NA	<1	Trace fine gravel in QC sample I/J (Till)
408.6			17							
407.6	LEAN CLAY (CL), as above, medium stiff to stiff. (Till)		18	J		100	0.5 to 1.5	NA	<1	
406.6			19							
405.6	Same as above, stiff to very stiff.		20	K		NR	1.5 to 2.5	NA	<1	
404.6			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-111 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.6 Completion Depth 24.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371692.4 E.(Y) 787438.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, density increases towards 24' bgs.			L		NR	1.0 to 3.0	NA	<1	
402.6			23							
401.6	**End of Boring at 24 feet.**		24							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-112 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.2 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 371772.5 E.(Y) 787461.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), with 20% to 30% silt, trace fine sand, trace fine gravel, plastic, 2.5Y 5/2 grayish brown, no odor, dry, very stiff. (Fill)			A		100	2.0 to 2.5	NA	<1	
423.2			1							
422.2	Same as above, grades to yellow brown below 2' bgs.		2	B		100	0.5 to 1.0	NA	<1	
421.2	**LEAN CLAY WITH GRAVEL (CL),** medium to coarse gravel and pieces of brick, 10YR 4/2 dark gray brown. (Fill)		3							
420.2	**LEAN CLAY (CL),** with 10% to 20% silt, trace gravel, low to medium plasticity, 10YR 5/6 yellow brown, gray mottling, no odor, moderately wet, stiff. (Fill)		4	C		92	1.25	NA	<1	
419.2			5							
418.2	Same as above, but 10% to 20% gravel, 10YR 5/3 brown, wet, soft. (Fill)		6	D		92	0.5	NA	<1	
417.2			7							
416.2	Same as above. (Fill)		8	E		83	0.5	NA	<1	
415.2			9							
414.2	**LEAN CLAY (CL),** with 10% to 20% silt, trace fine sand, low to medium plasticity, mostly 10YR 5/6 yellow brown with 2.5YR 5/2 gray brown mottling, no odor,		10	F		83	2.0 to 3.0	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-112 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.2 Completion Depth 28.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 371772.5 E (Y) 787461.4

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	moderately wet, very stiff. (Native)									
412.2	Same as above, with black staining.		12	G		100	2.5 to 3.0	NA	7	
411.2			13							
410.2	Same as above		14	H		100	2.0 to 2.5	NA	7	
409.2			15							
408.2	Same as above, decreasing gray mottling with depth (to ~10%), black staining persists, medium stiff.		16	I		100	0.5 to 1.0	NA	7	Trace fine gravel in QC sample I/J.
407.2			17							
406.2	Same as above, <10% gray mottling.		18	J		100	0.5 to 1.0	NA	12	
405.2			19							
404.2	Same as above, stiff.		20	K		100	2.0	NA	30	Sample K collected above the sand.
403.2			21							
	SILTY SAND (SM), 30% to 40% silt, trace clay, 10YR 5/6 yellow brown, no									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-112 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.2 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 371772.5 E.(Y) 787461.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	odor, wet.			L		100	3.0	NA	57	
401.2	**LEAN CLAY (CL),** 10% silt, 5% to 10% gravel, low plasticity, 10YR 4/6 dark yellow brown, uniform color and texture, slightly wet, very stiff. Decreasing PID readings with depth (to <2 ppm). (Till)		23							
400.2	Same as above, trace gravel, evidence of vertical fracturing bordered by gray mottling. (Till)		24	M		NR	2.0 to 3.0	NA	2 12	
399.2			25							
398.2	Same as above. (Till)		26	N		NR	2.0 to 3.0	NA	33	
397.2			27							
396.2	**End of Boring at 28 feet.**		28							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-113 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.9 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/14/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 371672.4 E.(Y) 787421.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, non-plastic, 10YR 5/6 yellow brown, no odor, dry, stiff.			A		100	1.5 to 2.0	NA	<1	
424.9			1							
423.9	Same as above, 10%-20% silt, 10YR 6/3 pale brown, very stiff to hard.		2	B		100	3.0 to 4.5	NA	<1	
422.9			3							
421.9	Same as above, but 10YR 5/6 yellowish brown, moderate mottling, stiff.		4	C		100	1.5 to 2.0	NA	<1	
420.9			5							
419.9	Same as above, but moderately plastic, moderately wet.		6	D		100	1.0 to 2.0	NA	<1	
418.9			7							
417.9	Same as above.		8	E		100	1.5 to 2.0	NA	<1	
416.9			9							
415.9	Same as above, very plastic.		10	F		100	1.25 to 2.0	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson — Boring No: SB-113 — Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 425.9 — Completion Depth: 28.0

Fed. ID. No: _____ — Auger Depth: _____ — Rotary Depth: _____

Quadrangle: NE 1/4 of NW 1/4 — Sec: 5 — T: 10 S — R: 2 E — Date: Start: 9/14/00 — Finish: 9/15/00

UTM (or State Plane) Coord. N.(X): 371672.4 — E.(Y): 787421.7

Latitude: ___° ___' ___" — Longitude: ___° ___' ___"

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL:
G - T. Silverman
D - J. Pilsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
413.9	Same as above, moderately plastic, very stiff.		12	G		100	2.0 to 3.0	NA	<1	
412.9			13							
411.9	Same as above, high plasticity, stiff to very stiff.		14	H		100	1.5 to 2.5	NA	<1	
410.9			15							
409.9	Same as above, moderate plasticity, stiff.		16	I		100	1.25	NA	<1	Trace fine gravel in QC sample I/J, very uniform color and texture (Till).
408.9			17							
407.9	Same as above, high plasticity, stiff		18	J		100	1.0 to 1.5	NA	<1	
406.9			19							
405.9	Same as above.		20	K		100	1.5 to 2.0	NA	3	
404.9			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-113 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.9 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/14/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 371672.4 E.(Y) 787421.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, with trace medium gravel.			L		100	1.0 to 2.0	NA	<1	
402.9			23							
401.9	**LEAN CLAY (CL),** 10%-20% silt, low plasticity, 10YR 5/4 yellow brown, no odor, moderately wet, very stiff.		24	M		NR	3.0	NA	<1	Boring continued on 9/15/00 from 24' bgs (SB-113A).
400.9			25							
399.9	Same as above, but with traces of gray weathered sandstone.		26	N		NR	2.5 to 3.0	NA	<1	
398.9			27							
397.9	**End of Boring at 28 feet.**		28							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-114 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.5 Completion Depth 40.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 371743.7 E.(Y) 787459.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, trace fine gravel, non-plastic, 10YR 5/4 yellow brown, no odor, dry, stiff to very stiff. (Fill)			A		92	1.5 to 2.25	NA	<1	
423.5			1							
422.5	Same as above, 10%-20% silt, trace gravel, medium plasticity, gray mottling, very stiff.		2	B		92	2.25 to 3.0	NA	<1	
421.5			3							
420.5	**LEAN CLAY (CL),** as above, but 50% 10YR 5/6 yellow brown and 50% 2.5Y 6/2 light brown gray, some black staining, no gravel, stiff to very stiff.		4	C		100	1.75 to 3.0	NA	<1	
419.5			5							
418.5	Same as above, moderately wet, stiff.		6	D		100	1.75 to 2.0	NA	<1	
417.5			7							
416.5	Same as above, medium stiff to stiff.		8	E		100	0.5 to 1.0	NA	<1	
415.5			9							
414.5	Same as above, stiff.		10	F		100	1.0 to 2.0	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-114 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.5 Completion Depth 40.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R 2 E Date Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 371743.7 E.(Y) 787459.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
412.5	Same as above, but primarily 10YR 5/6 yellow brown with some light gray mottling, very stiff.		12	G		100	2.0 to 2.25	NA	<1	
411.5			13							
410.5	Same as above.		14	H		100	2.0 to 2.5	NA	<1	
409.5			15							
408.5	Same as above, wet between 16' and 18' bgs, medium stiff to stiff.		16	I		100	0.75 to 1.25	NA	<1	
407.5			17							
406.5	Same as above, but increasing density below 18' bgs, very stiff at 19' to 20' bgs, more uniform clay with trace gravel below 19.8' bgs, stiff to very stiff.		18	J		100	1.5 to 3.75	NA	<1	
405.5			19							
404.5	LEAN CLAY (CL), as above, medium to coarse gravel between 21' and 22' bgs (10%-20% gravel), stiff. (Till)		20	K		92	2.0	NA	1.0	
403.5			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-114 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.5 Completion Depth 40.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 371743.7 E.(Y) 787459.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, trace gravel, very uniform, very little mottling (some mottling, but less than above), some black staining, very stiff.			L		92	3.0 to 3.5	NA	1.5	
401.5			23							
400.5	Same as above, some long vertical fractures lined with gray mottling.		24	M		100	3.0 to 3.25	NA	11	
399.5			25							
398.5	Same as above.		26	N		100	3.0	NA	9	
397.5			27							
396.5	Same as above, trace gravel.		28	O		NR	3.0 to 3.75	NA	20	
395.5			29							
394.5	Same as above, with pieces of gray weathered sandstone.		30	P		NR	3.0 to 3.75	NA	26	
393.5			31							
392.5	Same as above, no weathered sandstone, loose weathered clay and silt between 32' and 32.8' bgs.		32	Q		NR	2.5	NA	13	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-114 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.5 Completion Depth 40.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 371743.7 E (Y) 787459.7

Latitude ___ ___ ___ Longitude ___ ___ ___

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
390 5	Same as above.		34	R		NR	2 5 to 3 5	NA	2	
389 5			35							
388 5	Same as above, medium stiff.		36	S		NR	0 5 to 1 0	NA	<1	
387 5	LEAN CLAY (CL), with scattered pockets fo sand, trace fine gravel, very plastic, 2.5Y 5/1 gray, no odor, moderately wet, medium stiff. (Till)		37							
386 5			38	T		NR	0 5 to 1.0	NA	<1	
385 5			39							
384 5	End of Boring at 40 feet.		40							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-115 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.8 Completion Depth 47.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371771.5 E.(Y) 787432.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, trace fine gravel, low plasticity, 10YR 6/3 pale brown, no odor, dry, stiff. (Fill)			A		88	1.0 to 1.5	NA	<1	
422.8			1							
	Grades to 10YR 4/6 dark yellow brown below 1.5' bgs.									
421.8	Same as above, but 10YR 3/4 dark yellow brown and soft below 3.5' (with 10%-20% gravel below 3.5' bgs).		2	B		88	0.5 to 2.0	NA	<1	
420.8			3							
419.8	Same as above.		4	C		92	0.5 to 2.0	NA	2	
418.8	**LEAN CLAY (CL)**, as above, but no gravel, plastic, 10YR 4/6 dark yellow brown, moderately wet, medium stiff to stiff. (Native)		5							
417.8	Same as above, but 10%-20% silt, 10YR 5/6 yellow brown with 2.5Y 5/1 grayish brown (about 40%), stiff to very stiff.		6	D		92	1.5 to 2.25	NA	3	
416.8			7							
415.8	Same as above.		8	E		100		NA	19	Trace fine gravel in QC sample E/F.
414.8			9							
413.8	Same as above.		10	F		100		NA	24	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson — Boring No: SB-115 — Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 423.8 — Completion Depth: 47.5

Fed. ID. No.: _____ — Auger Depth: _____ — Rotary Depth: _____

Quadrangle: SE 1/4 of SW 1/4 — Sec: 32 — T: 9 S — R: 2 E — Date Start: 9/16/00 — Finish: 9/28/00

UTM (or State Plane) Coord. N.(X): 371771.5 — E (Y): 787432.2

Latitude: ___ ° ___ ' ___ " — Longitude: ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL:
G - T. Silverman
D - J. Pilsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
411.8	Same as above.		12	G		100	1.0 to 2.0	NA	67	
410.8	SILT (ML), 20% clay, 20% sand, 2.5Y 7/4 pale yellow, moderately wet, medium dense. (High PID reading in silt.) LEAN CLAY (CL), as at 12' bgs, 20% gray, very stiff.		13							
409.8	Same as above.		14	H		100	2.0 to 2.5	NA	76	
408.8			15							
407.8	Same as above.		16	I		100	2.0	NA	96	Trace fine gravel in QC sample I/J.
406.8			17							
405.8			18	J		100	2.0 to 0.5	NA	84	Sample J collected above the sand.
	SILTY SAND (SM), 30%-40% silt, 10YR 5/6 yellow brown, no odor, wet.									
404.8			19							
403.8	LEAN CLAY (CL), as at 13' bgs, stiff.		20	K		NR	1.0	NA	42	
402.8			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-115 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.8 Completion Depth 47.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371771.5 E.(Y) 787432.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
400.8	**LEAN CLAY (CL),** as above, 10% silt, trace gravel, low plasticity,10YR 5/4 yellow brown, no odor, slightly wet, stiff to very stiff. Very uniform clay, evidence of fracture flow indicated by grey mottling and high PID readings. (Till)		23	L		NR	1.0 to 3.0	NA	117	
399.8	Same as above, 20%-30% silt, 5%-10% gravel, 10YR 4/6 dark yellow brown, no odor, moderately wet, stiff to very stiff.		24	M		100	1.0 to 3.0	NA	376	Samples from intervals M, N, O, and P have a strong chemical odor after equilibrating in glass jars (solvent?)
398.8			25							
397.8	Same as above, trace medium to coarse gravel, 10YR 4/6 dark yellow brown, fractures evident. (Till)		26	N		100	1.0 to 3.0	NA	235	
396.8			27							
395.8	Same as above, 24' to 26' interval.		28	O		NR		NA	120	
394.8			29							
393.8	Same as above, with weathered sections (as at 24' to 26' bgs) interspersed, high PIDs recorded at weathered sections.		30	P		NR		NA	153	
392.8			31							
391.8	Same as above, 20% to 30% silt, plastic, yellow brown and gray, no odor, dry, very stiff. (Till)		32	Q		100	2.25	NA	32	Refusal at 32 feet on 9/16/00. Boring continued from 32' bgs on 9/28/00 by R. Hafemeister.

(950226)

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-115 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.8 Completion Depth 47.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/16/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371771.5 E (Y) 787432.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
389.8	SILTY SAND (SM)		34	R		100	2.25	NA	35	
	LEAN CLAY (CL), as at 32' bgs. (Till)									
388.8			35							
387.8	Same as above, brown and gray mottling, stiff.		36	S		100	1.25	NA	<2	
386.8			37							
	3" Sand seam at 37.3' bgs.									
	4" Silt seam at 37.6' bgs.									
385.8	Same as above, trace fine gravel, plastic, color change to 10YR 5/1 gray, no odor.		38	T		100	1.0	NA	<2	
384.8			39							
383.8	Same as above, no odor, dry.		40	U		100	1.0	NA	<2	
382.8			41							
381.8	Same as above, no odor, dry.		42	V		100	1.5	NA	<2	
380.8			43							

(950226)

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-115 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.8 Completion Depth 47.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371771.5 E.(Y) 787432.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			W		100		NA	<2	
	SANDSTONE, weathered.									
378.8			45							
377.8			46	X		100	NA	NA	<2	
376.8			47							
	End of Boring at 47.5 feet.									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-116 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.4 Completion Depth 20.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/13/00 Finish 9/13/00

UTM (or State Plane) Coord. N.(X) 371691.9 E.(Y) 787379.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), with sand and gravel, stiff to very stiff. (Fill)			A		100	2.0 to 2.5	NA	<1	
424.4			1							
423.4	**LEAN CLAY (CL)**, 20%-30% silt, trace fine sand, non-plastic, 10YR 5/3 brown, some mottling, no odor, dry, very stiff. (Native)		2	B		100	3.0	NA	38	
422.4			3							
421.4	Same as above, moderately wet, soft to medium stiff.		4	C		96	0.5 to 1.0	NA	60	
420.4			5							
419.4	Same as above, medium stiff to stiff.		6	D		96	0.5 to 1.5	NA	18	
418.4			7							
	Color change to 10YR 5/4 yellow brown below 7.5' bgs, little mottling.									
417.4	Same as above, but less silt (10%-20%), very mottled, very stiff.		8	E		100	2.5 to 2.75	NA	51	
416.4			9							
415.4	Same as above, stiff to very stiff.		10	F		100	1.0 to 2.25	NA	89	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson Boring No: SB-116 Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge Surface Elevation: 425.4 Completion Depth: 20.0

Fed ID No: _____ Auger Depth: _____ Rotary Depth: _____

Quadrangle: NE 1/4 of NW 1/4 Sec: 5 T: 10 S R: 2 E Date Start: 9/13/00 Finish: 9/13/00

UTM (or State Plane) Coord N (X): 371691.9 E (Y): 787379.7

Latitude: ___ ° ___ ' ___ " Longitude: ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL:
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
413.4	Same as above, stiff.		12	G		100	1.0 to 1.5	NA	144	
412.4			13							
411.4	SILTY SAND (SM), fine sand, 10YR 5/6 yellow brown, no odor, moderately wet, loose.		14	H		100	0.5 to 1.0	NA	66	
410.4	LEAN CLAY (CL), 10%-20% silt, moderately plastic, 10YR 5/6 yellow brown, moderately wet, stiff.		15							
409.4	Same as above.		16	I		NR	NR	NA	54	
408.4			17							
407.4	Same as above.		18	J		NR	NR	NA	30	
406.4			19							
405.4	End of Boring at 20 feet.		20							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-117 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.7 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 371753.5 E.(Y) 787309.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-20% silt, trace fine sand, plastic, 10YR 5/6 yellowish brown with some 5Y 6/1 gray, no odor, moderately wet, soft.			A		58	0.5	NA	1	
423.7			1							
422.7	Same as above, but mostly 5Y 6/1 gray, little 10YR 5/6 yellow brown, stiff.		2	B		58	1.0 to 2.0	NA	18	
421.7			3							
420.7	Same as above, grading to mostly 10YR 5/6 yellow brown below 5' bgs, some black staining (and still approximately 20% 5Y 6/1 gray), very stiff.		4	C		92	2.0 to 2.75	NA	48	
419.7			5							
418.7	Same as above, stiff.		6	D		92	1.5 to 2.0	NA	20	
417.7			7							
416.7	Same as above, stiff to very stiff.		8	E		100	1.75 to 2.25	NA	22	
415.7			9							
414.7	Same as above, with vertical fracturing (gray), stiff.		10	F		100	1.5 to 2.0	NA	14	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-117 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.7 Completion Depth 28.0

Fed ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 371753.5 E (Y) 787309.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
412.7	Same as above.		12	G		100	1.0 to 1.5	NA	69	
411.7			13							
410.7	SILTY SAND (SM), fine sand. 40% silt. 5%-10% clay. 10YR 6/6 brownish yellow. no odor. wet. medium dense. LEAN CLAY (CL), as at 12' bgs.		14	H		100	1.25	NA	85 64	Higher PID reading in silty sand. Sample H collected below sand.
409.7			15							
408.7	Same as above. (Fractures correspond to highest PID hits. Also, fractures often are expansive laterally - often 1" to 2" in radius, spaced approximately 6" to 10" apart. They look like gray globs within the clay - see soil sample I/J).		16	I		100	1.25	NA	75	
407.7			17							
406.7	Same as above.		18	J		100	1.0 to 1.25	NA	25	
405.7			19							
	SILTY SAND (SM), as at 14' bgs.									
404.7	SILT (ML), with 30%-40% clay. very wet. very soft.		20	K		100	<0.5	NA	12	
403.7			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-117 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.7 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 371753.5 E.(Y) 787309.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), as at 14.3 feet, but uniform, trace silt, trace gravel, medium plasticity, vertical gray fractures and nodes, nodes and fractures correspond to high PID readings, 10YR 5/6 yellow brown, moderately wet, very stiff. (Till)			L		100	2.0 to 2.5	NA	25	
401.7			23							
400.7	Same as above, no gravel, but long, wide, vertical fractures, stiff.		24	M		100	1.25 to 1.75	NA	24	
399.7			25							
398.7	Same as above, but trace gravel, long thin vertical fractures (look like tributaries and rivers), very stiff.		26	N		100	2.25 to 2.75	NA	47	
397.7			27							
396.7	**End of Boring at 28 feet.**		28							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-118 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.3 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 371873.2 E.(Y) 787389.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10% to 20% silt, trace fine sand, trace fine gravel, medium plasticity, 10YR 6/4 light yellow brown, moderately wet, medium stiff to stiff. (Fill)			A		88	0.75 to 1.5	NA	<1	
422.3			1							
421.3	Same as above, but zones of 10YR 5/6 yellow brown and black staining, stiff, slightly more stiff with depth.		2	B		88	1.0 to 1.75	NA	<1	
420.3			3							
419.3	**LEAN CLAY (CL)**, as above, but no gravel, primarily 10YR 5/6 yellow brown with gray mottling stains and black stains, very stiff.		4	C		100	2.0 to 2.75	NA	<1	
418.3			5							
417.3	Same as above, moderately wet near 8' bgs, slightly less stiff at 8' bgs.		6	D		100	2.5 to 3.0	NA	<1	ECCS technician notes sample 118D would not settle at 70,000 rpm; 80,000 rpm cleared bottle. Yellow extract.
416.3			7							
415.3	Same as above, plastic, moderately wet.		8	E		NR	2.5 to 3.0	NA	<1	
414.3			9							
413.3	Same as above.		10	F		NR	2.0 to 2.75	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson Boring No: SB-118 Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge Surface Elevation: 423.3 Completion Depth: 28.0

Fed ID No: _____ Auger Depth: _____ Rotary Depth: _____

Quadrangle: SE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start: 9/16/00 Finish: 9/16/00

UTM (or State Plane) Coord. N (X): 371873.2 E (Y): 787389.9

Latitude: ___ ° ___ ' ___ " Longitude: ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL:
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
411.3	Same as above, stiff.		12	G		100	1.0 to 2.0	NA	<1	
410.3			13							
409.3	Same as above, medium stiff to stiff.		14	H		100	0.5 to 1.25	NA	<1	
408.3			15							
407.3	Same as above, stiff to very stiff.		16	I		100	1.5 to 2.5	NA	<1	
406.3			17							
405.3	Same as above, very stiff.		18	J		100	2.0 to 3.0	NA	<1	
404.3			19							
403.3			20	K		100	NR	NA	3	Sample K collected above the sand.
	SILTY SAND (SM), 20%-30% silt, 10%-20% clay, 10YR 5/6 yellow brown, no odor, wet, loose.								8	
402.3	LEAN CLAY (CL), as at 18' bgs, gray mottling.		21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-118 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.3 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 371873.2 E.(Y) 787389.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				L		100		NA	2	
400.3	**LEAN CLAY (CL),** as above, but uniform, trace fine gravel, low plasticity, 10YR 4/6 dark yellow brown, no odor, slightly wet, fractures (gray). (Till)		23							
399.3	Same as above, some vertical fractures (gray on brown matrix).		24	M		NR		NA	5	
398.3			25							
397.3	Same as above.		26	N		NR		NA	3	
396.3			27							
395.3	**End of Boring at 28 feet.** (Refusal)		28							Refusal not on bedrock. Didn't attempt to sample 28' to 30' - very stiff.

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-119 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 37.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/15/00 Finish 9/29/00

UTM (or State Plane) Coord. N.(X) 371546.3 E.(Y) 787344.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low to medium plasticity, 2.5Y 5/3 light olive brown, red mottling, no odor, moderately wet, stiff to very stiff.			A		58	1.5 to 3.0	NA	<1	
425.7			1							
424.7	Same as above, but plastic, color changes to 5Y 5/1 gray below 2' bgs, wet, stiff.		2	B		58	1.5 to 2.0	NA	<1	
423.7			3							
422.7	Same as above, but 10%-20% silt, medium stiff to stiff.		4	C		83	0.5 to 1.25	NA	<1	
421.7			5							
420.7	Same as above, but 2.5Y 5/4 light olive brown with some gray mottling, dry, stiff		6	D		83	1.5 to 1.75	NA	<1	
419.7			7							
418.7	Same as above, but 10YR 5/4 yellowish brown with gray mottling and black stains, moderately wet.		8	E		100	1.0	NA	<1	Trace fine gravel in QC sample E/F.
417.7			9							
416.7	Same as above, stiff.		10	F		100	1.5 to 2.0	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No.: SB-119 — Monitor Well No. _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 426.7 — Completion Depth: 37.5

Fed. ID No. _____ — Auger Depth _____ — Rotary Depth _____

Quadrangle: NE 1/4 of NW 1/4 — Sec. 5 — T 10 S — R 2 E — Date: Start 9/15/00 — Finish 9/29/00

UTM (or State Plane) Coord. N.(X): 371546.3 — E (Y): 787344.6

Latitude ___ ° ___ ' ___ " — Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL:
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.7	Same as above, stiff.		12	G		100	1.5	NA	<1	Trace very fine gravel in QC sample G/H, with black staining.
413.7			13							
412.7	Same as above, but 10YR 5/6 yellow brown with gray mottling and black staining, very stiff.		14	H		100	2.0 to 2.25	NA	<1	
411.7			15							
410.7	Same as above, medium stiff to stiff.		16	I		100	0.75 to 1.25	NA	<1	Trace very fine gravel in QC sample I/J.
409.7			17							
408.7	Same as above, increasing stiffness to very stiff between 18' and 20' bgs.		18	J		100	1.0 to 2.75	NA	<1	
407.7			19							
406.7	SILTY SAND (SM), 40%-50% silt, 10YR 5/4 yellowish brown, no odor, wet, medium dense.		20	K		100	1.0 to 2.0	NA	<1	
405.7	LEAN CLAY (CL), as at 18' bgs. 10%-20% silt, stiff.		21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-119 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 37.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/15/00 Finish 9/29/00

UTM (or State Plane) Coord. N.(X) 371546.3 E.(Y) 787344.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), as above, but 5%-10% fine to coarse gravel, very uniform, no mottling, 10YR 5/4 yellow brown, very stiff. (Till)			L		100	2.25 to 2.75	NA	<1	
403.7			23							
402.7	Same as above, trace fine gravel.		24	M		100	2.5 to 3.0	NA	<1	
401.7			25							
400.7	Same as above.		26	N		100	2.5 to 3.0	NA	<1	
399.7			27							
398.7	**LEAN CLAY (CL),** as above, trace fine gravel, 10YR 6/8 yellow brown, vertical fractures, no odor, moist, very stiff. (Till)		28	O		100	3.0	NA	4.0	Soil boring continued from 28 feet bgs on 9/29/00 by R Hafemeister.
397.7			29							
396.7	Same as above, 2" sand seam at 30' bgs. Sand seam has no odor, wet.		30	P		100	3.0	NA	4.6	
395.7			31							
394.7	No recovery.		32	Q		0	NA	NA	NA	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-119 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 37.5

Fed ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date Start 9/15/00 Finish 9/29/00

UTM (or State Plane) Coord. N.(X) 371546.3 E (Y) 787344 6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
392.7	No recovery.		34	R		0	NA	NA	NA	
391.7			35							
390.7	Clay till, as at 28' bgs.		36	S		100	2.5	NA	<2	
389.7			37							
	SANDSTONE, weathered.									
	End of Boring at 37.5 feet. (Refusal)									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-120 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.2 Completion Depth 31.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 371320.6 E.(Y) 787467.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-20% silt, trace fine sand, medium to high plasticity, 10YR 5/4 yellowish brown, no odor, wet, stiff to very stiff.			A		58	1.0 to 2.5	NA	<1	
426.2			1							
425.2	Same as above, increasing mottling with depth, medium stiff to stiff.		2	B		58	0.5 to 2.0	NA	<1	
424.2			3							
423.2	Same as above, but color change to 5Y 5/2 olive gray with some traces of 10YR 5/4 yellowish brown, moderately wet, stiff.		4	C		100	1.0 to 1.25	NA	12	
422.2			5							
421.2	Same as above, color changes to 10YR 5/4 yellow brown at 7.5' bgs.		6	D		100	1.0 to 1.5	NA	11	
420.2			7							
419.2	Same as above, trace gravel, 10YR 5/4 yellow brown, mottling, stiff to very stiff.		8	E		92	1.75 to 2.75	NA	41	
418.2			9							
417.2	Same as above.		10	F		92	2.0 to 3.0	NA	18	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-120 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.2 Completion Depth 31.5

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 371320.6 E (Y) 787467.6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
415.2	Same as above, but 10YR 5/6 yellowish brown with gray mottling, stiff.		12	G		96	1.0 to 1.5	NA	21	
414.2			13							
413.2	Same as above.		14	H		96	1.0 to 1.5	NA	28	
412.2			15							
411.2	Same as above, medium stiff to stiff.		16	I		100	0.5 to 1.5	NA	72	Duplicate FDUP32/33-004-000914 collected.
410.2			17							
409.2	SANDY SILT (ML), 30% to 40% fine sand, 10YR 5/6 yellowish brown, no odor, wet, medium dense.		18	J		100	1.5	NA	65	
408.2			19							
407.2	LEAN CLAY (CL), trace silt, moderately plastic, 10YR 5/4 yellow brown, no odor, moderately wet, stiff.		20	K		58	1.0	NA	34	
406.2			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-120 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.2 Completion Depth 31.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 371320.6 E.(Y) 787467.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		58	1.75 to 2.0	NA	4	
404.2			23							
403.2	Same as above.		24	M		100	1.0	NA	15	
402.2			25							
401.2	**LEAN CLAY (CL),** as above, but 5%-15% silt, 10% medium to coarse gravel, very stiff. (Till)		26	N		100	2.5	NA	12	
400.2			27							
399.2	Same as above, but trace silt, trace gravel, stiff.		28	O		100	1.0	NA	<1	
398.2			29							
397.2	Same as above.		30	P		100	NR	NA	4	
396.2			31							
	End of Boring at 31.5 feet. (Refusal - weathered sandstone)									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-121 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.2 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 371686.7 E.(Y) 787256.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, 10YR 5/6 yellow brown with gray mottling, no odor, dry, medium stiff to stiff.			A		54	0.75 to 2.0	NA	<1	
426.2			1							
425.2	Same as above, but 10%-20% silt, plastic, 5Y 5/1 gray, slightly wet, medium stiff.		2	B		54	0.75	NA	<1	
424.2			3							
423.2	Same as above, but 2.5Y 5/2 grayish brown with some yellow brown, grading to more yellowish brown with depth, dry, stiff.		4	C		100	1.0 to 2.0	NA	3	
422.2			5							
421.2	Same as above, but 10YR 5/6 yellow brown with some gray mottling and black stains, stiff to very stiff.		6	D		100	1.75 to 2.5	NA	<1	
420.2			7							
419.2	Same as above, low to medium plasticity, moderately wet, stiff.		8	E		100	1.0 to 2.0	NA	<1	
418.2			9							
417.2	Same as above, stiff to very stiff.		10	F		100	2.0 to 3.0	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-121 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.2 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N (X) 371686.7 E (Y) 787256.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
415.2	Same as above, but moderate plasticity, half 10YR 5/6 yellow brown and half 5Y 6/2 light olive gray, grading to more yellow brown with depth, black staining, stiff to very stiff.		12	G		100	1.5 to 2.5	NA	<1	
414.2			13							
413.2	Same as above, more 10YR 5/6 yellow brown than light olive gray.		14	H		100	2.0 to 2.5	NA	<1	
412.2			15							
411.2	Same as above, plastic, moderately wet.		16	I		100	1.0 to 3.0	NA	<1	
410.2			17							
409.2	Same as above, medium stiff to stiff.		18	J		100	0.5 to 1.5	NA	<1	
408.2			19							
407.2	Same as above, stiff.		20	K		100	1.0 to 1.5	NA	<1	
406.2			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-121 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.2 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 371686.7 E.(Y) 787256.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				L		100	0.5 to 1.0	NA	<1	
404.2	**SILTY SAND (SM)**, fine sand, 20% clay, 20%-30% silt, 10YR 5/6 yellow brown with gray mottling, no odor, wet, loose.		23							
	LEAN CLAY (CL), as at 20 feet.									
403.2	**SILT (ML)**, trace clay and trace fine sand, 10YR 5/4 yellow brown, no odor, wet, medium stiff, some lamination. (Lacustrine)		24	M		100	0.5 to 1.0	NA	<1	
402.2			25							
401.2	Same as above.		26	N		100	0.5 to 1.0	NA	<1	
400.2			27							
399.2	Same as above, stiff.		28	O		NR	1.0 to 2.0	NA	3	QC sample O/P is finely laminated.
398.2			29							
397.2	**LEAN CLAY (CL)**, trace silt, low to medium plasticity, 10YR 5/4 yellowish brown, no odor, dry, stiff to very stiff. (Lacustrine)		30	P		NR	1.5 to 2.5	NA	19	
396.2			31							
	Increasing silt (10%-20%) below 31.5' bgs.									
395.2	**LEAN CLAY (CL)**, as above, 10% to 20% silt, trace fine gravel. (Till)		32	Q		NR		NA	22	Trace fine gravel in QC sample Q/R (Till)

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-121 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.2 Completion Depth 36.0

Fed. ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 371686.7 E (Y) 787256.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
393.2	Same as above.		34	R				NA	23	Duplicate FDUP32/33-007-000915 collected.
392.2			35							
391.2	**End of Boring at 36 feet.** (Refusal)		36							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-122 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.4 Completion Depth 28.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 371321.8 E.(Y) 787552.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20% to 30% silt, 5% fine sand, wood chips, gray and brown mottling, no odor, dry, stiff to very stiff. (Fill)			A		100	1.5 to 3.0	NA	<2	
425.4			1							
424.4	Same as above, very stiff.		2	B		100	2.0 to 2.75	NA	<2	
423.4			3							
422.4	Same as above, trace fine gravel, medium stiff to very stiff.		4	C		100	<1.0 to 2.75	NA	<2	
421.4			5							
420.4	Same as above, stiff.		6	D		100	1.0 to 1.5	NA	<2	
419.4	Broken rock layer from 7' to 7.25' bgs, dry.		7							
418.4	**LEAN CLAY (CL),** 20% to 30% silt, 5% fine sand, plastic, no odor, moist, medium stiff to stiff. (Native)		8	E		100	<1.0 to 2.0	NA	<2	
417.4			9							
416.4	Same as above, trace fine sand, stiff.		10	F		50	1.5	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No: SB-122 — Monitor Well No. _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 426.4 — Completion Depth: 28.5

Fed. ID No. _____ — Auger Depth _____ — Rotary Depth _____

Quadrangle: NE 1/4 of NW 1/4 — Sec. 5 — T 10 S — R 2 E — Date Start: 9/27/00 — Finish: 9/27/00

UTM (or State Plane) Coord. N (X): 371321.8 — E (Y): 787552.6

Latitude ___° ___' ___" — Longitude ___° ___' ___"

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.4	Same as above, less silt, little black staining, dry, stiff to very stiff.		12	G		100	1.4 to 2.5	NA	<2	
413.4			13							
412.4	Same as above, stiff.		14	H		100	1.6 to 1.3	NA	<2	
411.4			15							
410.4	Same as above, stiff to very stiff.		16	I		100	1.0 to 2.75	NA	<2	
409.4			17							
408.4	Same as above, stiff.		18	J		100	1.75 to 1.0	NA	<2	
407.4			19							
406.4	Same as above, trace gravel.		20	K		100	1.0 to 1.5	NA	<2	No gravel in QC sample K/L.
405.4			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-122 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.4 Completion Depth 28.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 371321.8 E.(Y) 787552.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff to very stiff.			L		100	1.0 to 3.0	NA	<2	
403.4			23							
402.4	**LEAN CLAY (CL)**, as above, fine gravel, stiff. (Till)		24	M		100	1.0 to 2.0	NA	<2	
401.4			25							
400.4	Same as above, hard.		26	N		100	3.0 to 4.5	NA	<2	
399.4			27							
	7" Fine sand, moist, at base of sample.									
398.4	**SANDSTONE**, weathered.		28	O		100	NA	NA	NR	
	End of Boring at 28.5 feet. (Refusal)									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-123 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.2 Completion Depth 29.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 371305.1 E.(Y) 787522.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, 5% fine sand, low plasticity, 10YR 5/3 brown, moist to wet, stiff to very stiff. (Fill)			A		92	1.5 to 2.5	NA	<1	
425.2	Same as above, trace sand below 1' bgs, and color changes to 10YR 5/6 yellow brown with 10%-20% gray mottling.		1							
424.2	Same as above, stiffness increases with depth.		2	B		92	1.0 to 3.0	NA	<1	
423.2			3							
422.2	Same as above, but 10%-20% silt, plastic, medium stiff to stiff, trace medium gravel at 5' bgs (1" to 2").		4	C		100	0.5 to 1.0	NA	<1	
421.2			5							
420.2	**LEAN CLAY (CL)**, as above, no gravel, 20%-30% mottling, some black staining. (Native)		6	D		100	0.5 to 1.0	NA	17	
419.2			7							
418.2	Same as above, stiff to very stiff.		8	E		96	1.0 to 2.5	NA	27	Duplicate FDUP32/33-027-000930 collected.
417.2			9							
416.2	Same as above, stiff.		10	F		96	1.5 to 2.0	NA	9	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No: SB-123 — Monitor Well No. _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 426.2 — Completion Depth: 29.0

Fed. ID. No _____ — Auger Depth _____ — Rotary Depth _____

Quadrangle: NE 1/4 of NW 1/4 — Sec. 5 — T. 10 S — R 2 E — Date: Start 9/30/00 — Finish 9/30/00

UTM (or State Plane) Coord. N (X): 371305.1 — E (Y): 787522.7

Latitude ___ ° ___ ' ___ " — Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL:
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.2	Same as above, stiff to very stiff, less stiff in mottled areas.		12	G		96	1.5 to 2.5	NA	65	
413.2			13							
412.2	Same as above, decreasing stiffness below 14.5 feet to soft.		14	H		96	0.5 to 1.5	NA	61	
411.2	SANDY SILT (ML), 30%-40% fine sand, grading to a silty sand (SM), 10YR 5/6 yellow brown, wet, stiff.		15							
410.2	LEAN CLAY (CL), as at 12' bgs, low to medium plasticity, medium stiff to stiff.		16	I		88	0.75 to 1.75	NA	30	
409.2			17							
408.2	Same as above, stiff.		18	J		88	1.0 to 2.0	NA	88	Duplicate FDUP32/33-028-000930 collected.
407.2			19							
406.2	Same as above, medium plasticity, 50%-60% mottled between 20' and 22' bgs, medium stiff to stiff.		20	K		100	0.75 to 1.5	NA	28	
405.2			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-123 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.2 Completion Depth 29.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 371305.1 E.(Y) 787522.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, 10%-15% mottled, stiff.			L		100	1.5 to 1.75	NA	13	
403.2			23							
402.2	Same as above, stiff to very stiff, increasing stiffness with depth.		24	M		96	1.5 to 2.5	NA	8	
401.2			25							
400.2	**LEAN CLAY (CL)**, trace silt, trace gravel, trace pockets of sand, low plasticity, 10YR 5/6 yellow brown, slightly moist, very hard, vertical fractures (gray), about 2%-5%. (Till)		26	N		96	4.5	NA	5	
399.2			27							
398.2	Same as above, high PID near top of weathered sandstone.		28	O		100	4.0	NA	41	
397.2	**End of Boring at 29 feet.** (Refusal - weathered sandstone bedrock)		29							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-124 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 35.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 371288.1 E.(Y) 787484.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, plastic, brownish yellow and gray mottling, mosit, soft to very stiff.			A		75	0.5 to 2.75	NA	<2	
425.7			1							
424.7	Same as above, stiff.		2	B		100	1.5	NA	<2	
423.7			3							
422.7	Same as above, no odor.		4	C		100	1.5	NA	<2	
421.7			5							
420.7	Same as above.		6	D		100	1.5 to 2.0	NA	<2	
419.7			7							
418.7	Same as above, some black staining.		8	E		100	1.8	NA	<2	
417.7			9							
416.7	Same as above.		10	F		100	1.5 to 2.0	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-124 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 35.5

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 371288.1 E (Y) 787484.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.7	Same as above.		12	G		100	1.0 to 2.0	NA	<2	
413.7			13							
412.7	Same as above, stiff to very stiff		14	H		100	1.5 to 3.0	NA	<2	
411.7			15							
410.7	Same as above, stiff.		16	I		100	1.0 to 1.5	NA	<2	
409.7			17							
408.7	Same as above.		18	J		100	1.0 to 1.5	NA	<2	
407.7			19							
406.7	Same as above, medium stiff to stiff.		20	K		100	0.75 to 1.0	NA	<2	
405.7			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-124 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 35.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 371288.1 E.(Y) 787484.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	0.75 to 1.0	NA	<2	
403.7			23							
402.7	Same as above, trace fine gravel, trace sand, stiff.		24	M		100	1.5	NA	4.9	
401.7			25							
400.7	Same as above, stiff to very stiff.		26	N		100	1.5 to 2.5	NA	2.6	
399.7			27							
398.7	Same as above, very stiff.		28	O		100	3.5	NA	2.4	
397.7			29							
396.7	Same as above, 10% to 15% sand, hard.		30	P		100	4.0	NA	3.6	
395.7			31							
394.7			32	Q		100	NA	NA	2.5	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-124 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 35.5

Fed. ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N (X) 371288.1 E (Y) 787484.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL:
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
392.7	**SANDSTONE**, weathered, dry, no odor.		34	R		100	NA	NA	2.4	
391.7			35							
	End of Boring at 35.5 feet. (Refusal)									

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-125 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.0 Completion Depth 37.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 371344.0 E.(Y) 787338.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	TOPSOIL		A		100	1.5 to 2.0	NA	<2	
426.0	**LEAN CLAY (CL)**, 20% to 30% silt, trace fine sand, plastic, gray and brown mottling, no odor, dry, stiff.	1							
425.0	Same as above, very stiff.	2	B		100	3.0	NA	<2	
424.0		3							
423.0	Same as above, moist, medium stiff.	4	C		100	0.5	NA	<2	
422.0		5							
421.0	Same as above.	6	D		100	0.5	NA	<2	
420.0		7							
419.0	Same as above, stiff.	8	E		100	1.5	NA	<2	
418.0		9							
417.0	Same as above, very stiff.	10	F		100	3.0	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-125 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.0 Completion Depth 37.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N (X) 371344.0 E (Y) 787338.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hom
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
415.0	Same as above, but 30% to 40% silt, 10% fine sand, stiff.		12	G		100	1.5	NA	<2	
414.0			13							
413.0	Same as above, 20% to 30% silt, trace fine sand.		14	H		100	1.0	NA	7	
412.0			15							
411.0	Same as above, dry.		16	I		100	1.7	NA	<2	
410.0			17							
409.0	Same as above.		18	J		100	2.0	NA	<2	
408.0	3" Silty sand at 19.2' bgs, wet.		19							
407.0	Same as above.		20	K		100	1.2	NA	<2	
	Little sand at 20.5' bgs.									
406.0			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-125 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.0 Completion Depth 37.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 371344.0 E.(Y) 787338.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, very stiff.			L		100	3.75	NA	<2	
							3.5			
404.0			23							
	WELL GRADED SAND (SW), fine to coarse sand, 10% fine gravel, 5% silt, 10YR 6/8 yellowish brown, no odor, wet.									
403.0	Same as above.		24	M		100	NA	NA	104	
402.0	2" clay seam at 25' bgs.		25							
401.0	2" clay seam at 26' bgs.		26	N		100	NA	NA	58	
400.0			27							
	1" clay at 27.7' bgs.									
399.0	Same as above, few fine gravel, wet.		28	O		100	NA	NA	78	
	4" clay seam at 28.5' bgs.									
398.0			29							
397.0	Same as above.		30	P		100	NA	NA	58	
396.0			31							
395.0	**SILT (ML)**, trace sand, yellowish brown, no odor, moist.		32	Q		100	NR	NA	<2	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-125 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.0 Completion Depth 37.5

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 371344.0 E (Y) 787338.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 5% fine gravel. plastic, no odor, moist. (Till)									
393.0	Same as above, stiff.		34	R		100	1.5	NA	<2	
392.0			35							
391.0	Same as above, very stiff.		36	S		100	3.0	NA	9	Duplicate FDUP32/33-029-000930 collected.
390.0			37							
	End of Boring at 37.5 feet. (Refusal)									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-126 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.0 Completion Depth 47.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 371726.0 E.(Y) 787397.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 30% to 40% silt, trace fine sand, plastic, gray and brown mottling, no odor, dry, stiff to very stiff.			A		100	1.75 to 2.25	NA	25	
423.0			1							
422.0	Same as above, stiff.		2	B		100	1.75 to 2.0	NA	49	
421.0			3							
420.0	Same as above, 20% to 30% silt, trace fine sand.		4	C		100	1.0 to 1.5	NA	15	
419.0			5							
	3" silt seam at 5.5' bgs, dry.									
418.0	Same as above.		6	D		100	2.0	NA	18	
417.0			7							
416.0	Same as above.		8	E		100	1.5 to 2.0	NA	<2	
415.0			9							
414.0	Same as above.		10	F		100	1.0 to 1.75	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No: SB-126 — Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 424.0 — Completion Depth: 47.5

Fed ID No. _____ — Auger Depth: _____ — Rotary Depth: _____

Quadrangle: SE 1/4 of SW 1/4 — Sec. 32 — T. 9 S — R. 2 E — Date Start: 9/27/00 — Finish: 9/27/00

UTM (or State Plane) Coord. N.(X): 371726.0 — E.(Y): 787397.8

Latitude ___ ° ___ ' ___ " — Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
412.0	Same as above, trace very fine gravel, little black/dark brown staining, stiff to very stiff.		12	G		100	1.25 to 2.25	NA	<2	
411.0			13							
410.0	Same as above.		14	H		100	2.0 to 3.25	NA	<2	
409.0			15							
408.0	Same as above, no gravel, stiff.		16	I		100	1.0	NA	<2	
407.0			17							
406.0	Same as above.		18	J		100	1.0	NA	<2	
405.0			19							
404.0	Same as above, little silt.		20	K		100	2.0	NA	<2	
403.0			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-126 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.0 Completion Depth 47.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 371726.0 E.(Y) 787397.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	2.0	NA	<2	
401.0			23							
400.0	**LEAN CLAY (CL)**, as above, trace fine gravel, no staining, more uniform color and texture, no odor, dry, evidence of vertical fracturing, hard. (Till)		24	M		100	4.0	NA	<2	
399.0			25							
398.0	Same as above, vertical fractures, very stiff.		26	N		100	3.5	NA	3.0	
397.0			27							
396.0	Same as above, no fractures, stiff.		28	O		100	2.0	NA	<2	
395.0			29							
394.0	Same as above, no fractures, very stiff.		30	P		100	3.0	NA	<2	
393.0			31							
392.0	Same as above, no fractures.		32	Q		100	3.0	NA	20	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-126 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.0 Completion Depth 47.5

Fed ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord N.(X) 371726.0 E (Y) 787397.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	2" silt seam at 33', dry.									
390.0			34	R		100	>4.5	NA	88	
389.0	Piece of weathered sandstone from 35' to 36' bgs.		35							
388.0	LEAN CLAY (CL), few gravel, plastic, 10YR 5/1 gray, sweet odor, or plastic model cement odor, dry, stiff. (Till)		36	S		100	2.0	NA	40	
387.0			37							
386.0	Same as above, same odor.		38	T		100	2.0	NA	44	
385.0			39							
384.0	Same as above, same odor.		40	U		100	2.0	NA	95	Duplicate FDUP32/33-024-000927 collected. ECCS noted duplicate color appearance different than all other samples submitted.
383.0			41							
382.0	Same as above, same odor.		42	V		100	2.0	NA	36	
381.0			43							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-126 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.0 Completion Depth 47.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 371726.0 E.(Y) 787397.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, same odor.			W		100	2.0	NA	73	
379.0			45							
378.0	**SANDSTONE**, weathered.		46	X		100	2.0	NA	NR	
377.0			47							
	End of Boring at 47.5 feet. *(Refusal)*									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-127 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.9 Completion Depth 46.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371751.0 E.(Y) 787355.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, mostly 5Y 6/2 light olive gray, some 10YR 6/6 yellow brown, dry, very stiff to very hard.			A		100	3.5 to >4.5	NA	<1	
422.9			1							
421.9	Same as above, but mostly 10YR 5/6 yellow brown with olive gray mottling (30%-40%), slightly moist (increasing with depth), stiff.		2	B		100	2.0	NA	13	
420.9			3							
419.9	Same as above, with 5% black staining, stiff to very stiff.		4	C		100	2.0 to 2.5	NA	17	
418.9			5							
417.9	Same as above, about 50% gray mottling between 7.5' and 8.0' bgs, high PID hits in mottled areas, moist.		6	D		100	1.0 to 2.5	NA	114	
416.9			7							
415.9	Same as above, but 20%-30% mottled, stiff.		8	E		100	1.0 to 2.0	NA	153	
414.9			9							
413.9	Same as above, very stiff to hard below 11' bgs.		10	F		100	1.0 to 3.0	NA	163	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-127 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.9 Completion Depth 46.5

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/27/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371751.0 E (Y) 787355.5

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
411.9	Same as above, stiff.		12	G		100	1.0	NA	185	
410.9			13							
409.9	Same as above, stiff.		14	H		100	1.0 to 1.5	NA	342	Duplicate FDUP32/33-023-000927 collected.
408.9			15							
407.9	Same as above, gray mottled areas have high PID and less stiff (in general).		16	I		100	1.0 to 2.0	NA	198	
406.9			17							
405.9	Same as above.		18	J		100	1.0 to 2.0	NA	236	
404.9			19							
403.9			20	K		100	0.5	NA	104	
402.9	SILT (ML), 30%-40% clay, 5%-10% very fine sand, very narrow silty sand (SM) layers interspersed (with 20%-40% silt), 10YR 5/6 yellow brown, wet, soft, runny (this layer transmits water).		21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-127 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.9 Completion Depth 46.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371751.0 E.(Y) 787355.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				L		100		NA		
400.9	**LEAN CLAY (CL),** trace silt, low plasticity, 10YR 5/6 yellow brown, very uniform with distinct gray fractures (clay breaks easiest along fractures), slightly moist, stiff to very stiff. (Till)		23				2.0 to 3.0		172	
399.9	Same as above, very stiff, gravel pocket at 25' bgs, also dry to wet between 25' and 26' bgs, 20%-30% silt between 25' and 26.5' bgs.		24	M		100	2.5	NA	87	
398.9			25							
397.9	Same as above (above 25' bgs), 10% silt, with gray fractures, less uniform clay, trace gravel, weathered (mottling stains-orange, red, etc.) throughout, somewhat flaky and slightly moist, very stiff.		26	N		100	2.5 to 3.5	NA	103	
396.9			27							
395.9	Same as above, 2%-5% gravel, less fracturing (<5%), very stiff, but flaky, uniform color and texture.		28	O		100	2.5	NA	89	
394.9			29							
393.9	Same as above, less weathering, more uniform clay, not flaky, very stiff.		30	P		100	3.0 to 3.5	NA	10	
392.9			31							
391.9	Same as above, 20% sand between 32.5' and 33' bgs, trace fracturing.		32	Q		100	NR	NA	<1	Hard drilling.

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson — Boring No: SB-127 — Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 423.9 — Completion Depth: 46.5

Fed ID No.: _____ — Auger Depth: _____ — Rotary Depth: _____

Quadrangle: SE 1/4 of SW 1/4 — Sec. 32 — T. 9 S — R 2 E — Date Start: 9/27/00 — Finish: 9/28/00

UTM (or State Plane) Coord. N.(X): 371751.0 — E (Y): 787355.5

Latitude: ___ ° ___ ' ___ " — Longitude: ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL:
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
389.9	Same as above.		34	R		100	NR	NA	<1	
388.9			35							
387.9	LEAN CLAY (CL), as above, 10% to 20% silt, trace fine sand, trace fine gravel, very plastic, 5Y 4/1 gray, moist, medium stiff. (Till)		36	S		100	0.5 to 0.75	NA	<1	Soil boring continued below 36' bgs on 9/28/00 in adjacent location (blind drilled to 36' bgs).
386.9			37							
385.9	Same as above.		38	T		100	0.5 to 0.75	NA	<1	
384.9			39							
383.9	Same as above, medium stiff to stiff.		40	U		100	0.75 to 1.25	NA	2	PID hit at upper portion of sample (likely slough) from contaminated groundwater, not soil.
382.9			41							
381.9	Same as above, trace fine to coarse gravel, some pieces of weathered sandstone.		42	V		100	0.75 to 1.25	NA	<1	
380.9			43							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-127 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.9 Completion Depth 46.5

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371751.0 E.(Y) 787355.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			W		100	0.75 to 1.25	NA	<1	
378.9			45							
377.9			46	X		NR	NR	NA	NR	
	End of Boring at 46.5 feet. (Refusal)									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-128 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.8 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/28/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371708.2 E.(Y) 787346.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, plastic, brown, no odor, moist, stiff.			A		50	1.0 to 2.0	NA	3.0	
423.8			1							
422.8	Same as above, color change to gray, petroleum-like odor.		2	B		100	1.5	NA	3.5	
421.8			3							
420.8	Same as above, no odor, very stiff.		4	C		100	2.5	NA	<2	
	2" sand seam at 4.5' bgs, dry, no odor.									
419.8	Color change to mottled brown and gray at 5' bgs.		5							
418.8	Same as above, no odor, dry, stiff.		6	D		100	2.0	NA	<2	
417.8			7							
416.8	Same as above.		8	E		100	1.0 to 2.0	NA	<2	
415.8			9							
414.8	Same as above, hard to very stiff.		10	F		100	4.0 to 3.0	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson Boring No: SB-128 Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge Surface Elevation: 424.8 Completion Depth: 48.0

Fed ID. No.: _____ Auger Depth: _____ Rotary Depth: _____

Quadrangle: NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date Start: 9/28/00 Finish: 9/28/00

UTM (or State Plane) Coord. N.(X): 371708.2 E (Y): 787346.6

Latitude: ___ ° ___ ' ___ " Longitude: ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
412.8	Same as above, few vertical fractures, stiff.		12	G		100	1.5	NA	<2	
411.8			13							
410.8	Same as above.		14	H		100	1.75	NA	<2	
409.8	3" sand seam at 15' bgs, wet.		15							
408.8	Same as above.		16	I		100	1.5	NA	<2	QC sample I/J has very uniform color and texture, but no gravel.
407.8			17							
406.8	Same as above, very stiff.		18	J		100	3.0	NA	<2	
405.8			19							
404.8	SANDY LEAN CLAY (CL), few silt, plastic, brown, no odor, moist.		20	K		100		NA	5.9	
403.8	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, plastic, gray and brown mottling, no odor, dry, stiff. (Till)		21				2.0			

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-128 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.8 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/28/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371708.2 E.(Y) 787346.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, trace fine gravel.			L		100	1.5 to 2.0	NA	<2	
401.8			23							
400.8	Same as above. 4" Wet sand seam at 24' bgs.		24	M		100	1.5 to 1.75	NA	<2	QC sample M/N has trace fine gravel, very uniform color and texture.
399.8			25							
	1" sand at 25.5' bgs.									
398.8	Same as above, very stiff to hard.		26	N		100	2.25 to 4.0	NA	<2	
397.8			27							
396.8	Same as above, hard.		28	O		100	4.5	NA	22	QC sample O/P looks like clay till.
395.8			29							
394.8	Same as above, vertical fractures, very stiff.		30	P		100	2.75 to 3.75	NA	2.0	
393.8			31							
392.8	**POORLY GRADED SAND (SP)**, fine to medium grained, 10YR 6/8 brownish yellow, no odor, wet.		32	Q		100	NA	NA	6.0	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-128 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.8 Completion Depth 48.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date Start 9/28/00 Finish 9/28/00

UTM (or State Plane) Coord N.(X) 371708.2 E (Y) 787346 6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
390.8	Same as above.		34	R		100	NA	NA	<2	
389.8			35							
	LEAN CLAY (CL), 5% to 10% gravel, plastic, brown and yellow mottling, vertical fractures, no odor, dry, very stiff. (Till) Same as above, less gravel, plastic, brownish yellow and gray mottling, fewer fractures, no odor, moist, stiff						3.0			
388.8			36	S		100	1.0	NA	29.9	Sample jammed in tube. Moved over 3' and start sampling from 36 feet bgs.
387.8			37							
386.8	Same as above.		38	T		100	1.0	NA	13	
385.8			39							
384.8	Same as above.		40	U		50	2.0	NA	<2	
	6" sandy silt at 40.5' bgs.									
383.8			41							
382.8	Same as above.		42	V		75	1.5	NA	<2	
381.8			43							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-128 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 424.8 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/28/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371708.2 E.(Y) 787346.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			W		100	1.0	NA	<2	
379.8			45							
378.8	Same as above.		46	X		100	1.0	NA	<2	
377.8			47							
	SANDSTONE									
376.8	**End of Boring at 48 feet.**		48							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-129 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.7 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/29/00 Finish 9/29/00

UTM (or State Plane) Coord. N.(X) 371674.1 E.(Y) 787331.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, 10YR 5/4 yellow brown, wet, stiff. (Fill)			A		100	1.5 to 2.0	NA	<1	
424.7	Below 1' bgs, 2.5Y 6/3 light yellow brown with yellow brown traces throughout, moist, stiff. (Fill)		1							
423.7	**LEAN CLAY (CL)**, as above, very stiff. (Native)		2	B		100	2.5 to 3.5	NA	<1	
422.7			3							
421.7	Same as above, but grading to more 10YR 5/6 yellow brown with gray mottling (about 40%), and black staining (<5%), stiff.		4	C		100	1.5 to 2.0	NA	<1	
420.7			5							
419.7	Same as above, 10%-20% silt, medium plasticity, 20% mottling, moist to wet, stiff to very stiff.		6	D		100	2.0 to 3.5	NA	<1	
418.7			7							
417.7	Same as above, stiff.		8	E		100	1.0 to 1.75	NA	<1	
416.7			9							
415.7	Same as above, stiff to very stiff. Mottled areas are less stiff than yellow brown areas.		10	F		100	1.5 to 2.5	NA	<1	
414.7			11							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-129 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.7 Completion Depth 44.0

Fed ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date Start 9/29/00 Finish 9/29/00

UTM (or State Plane) Coord. N.(X) 371674.1 E (Y) 787331.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, 5%-10% black staining.			G		100	1.5 to 2.5	NA	<1	
412.7			13							
411.7	Same as above medium stiff to stiff. Mottled areas are less stiff than yellow brown areas.		14	H		100	0.75 to 1.5	NA	<1	
410.7			15							
409.7	Same as above, plastic to very plastic, soft to medium stiff.		16	I		100	0.25 to 1.0	NA	<1	
408.7			17							
407.7	Same as above, stiff. Some organic material at 18' bgs.		18	J		100	1.0 to 2.0	NA	<1	
406.7			19							
405.7	LEAN CLAY (CL), 5%-10% silt, plastic, very uniform, 10YR 5/6 yellow brown, 5% vertical fractures (gray), trace black staining, slightly moist, stiff.		20	K		100	1.0 to 2.0	NA	<1	
404.7			21							
403.7	LEAN CLAY WITH SAND (CL), 20%-30% sand, low plasticity, trace gravel between 23' and 24' bgs, 10YR 5/6 yellow brown, soft to medium stiff. Still have gray mottling and black staining.		22	L		100	<0.5 to 1.0	NA	<1	
402.7			23							
	SILTY SAND (SM), 20%-30% silt, trace									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-129 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.7 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 9/29/00 Finish 9/29/00

UTM (or State Plane) Coord. N.(X) 371674.1 E.(Y) 787331.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	gravel, 10YR 5/6 yellow brown, wet, loose to medium dense. **LEAN CLAY (CL)**, as at 20 feet, but trace gravel, low plasticity, very stiff. (Till)			M		100	2.5 to 3.0	NA	<1	
400.7			25							
399.7	Same as above.		26	N		100	2.5 to 3.5	NA	<1	
398.7			27							
397.7	Same as above, fine sand (gray) within some fractures.		28	O		100	3.0	NA	<1	
396.7			29							
395.7	Same as above.		30	P		100	3.0	NA	<1	
394.7			31							
393.7	Same as above.		32	Q		100	2.0 to 3.0	NA	<1	
392.7			33							
391.7	Same as above.		34	R		100	2.0 to 2.5	NA	<1	
390.7			35							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-129 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.7 Completion Depth 44.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date Start 9/29/00 Finish 9/29/00

UTM (or State Plane) Coord. N.(X) 371674.1 E.(Y) 787331.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			S		100	2 0 to 2 25	NA	<1	3.5' sample between 36' and 39.5'; refusal due to filled Macrocore sampler.
388 7	Fine sand lense from 37' to 37.1' bgs.		37							
387 7	**SILTY SAND (SM)**, fine to medium sand, 30%-40% silt, trace clay, 10YR 5/6 yellow brown, wet, loose, decreasing silt to 10%-15% below 39' bgs.		38	T		75	NA	NA	<1	
386 7	**POORLY GRADED SAND (SP)**, fine to medium sand, 10%-15% silt, trace clay, 10YR 5/6 yellow brown, wet, loose.		39							
385 7	Same as above, but increasing sand grain size to medium to coarse between 41.5' and 42' bgs, trace gravel and fine sand between 42' and 42/5' bgs, increasing silt between 42.5' and 42.8' bgs, dense.		40	U		NR	NA	NA	3	
384 7			41							
383 7			42	V		NR		NA	<1	
382 7	**SILT (ML)**, trace fine sand, trace clay, non-plastic, 5Y 5/1 dark gray, moist, no apparent lamination, very hard.		43				>4			
381 7	**End of Boring at 44 feet.**		44							Sand and gravel from 38' to 42.8' collapsing into borehole after Macrocore sampler removed. Unable to drive casing below 41' without opening discrete interval sampler. Tried 2 times unsuccessfully to get sample from below 44' bgs.

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-130 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.0 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371773.5 E.(Y) 787261.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, plastic, 2.5Y 4/4 olive brown, wet, soft.			A		58	0.5	NA	<1	Note: 0' to 4' interval is very wet. No gutters on adjacent buildings, lots of rain on 9/24 to 9/25.
425.0			1							
424.0	Same as above, trace gravel, low plasticity, 2.5Y 6/3 light yellow brown with orange/red streaks (iron?), moist to wet, stiff.		2	B		58	1.5 to 2.0	NA	<1	
423.0			3							
422.0	Same as above, but grading to 2.5Y 5/4 olive brown with gray mottling below 4.5', approximately 20% black staining, <5% orange/red streaks, medium plasticity, moist, stiff to very stiff.		4	C		63	1.0 to 3.0	NA	<1	
421.0			5							
420.0	Same as above, 10% to 20% silt, no gravel, 2.5Y 5/4 olive brown, moist, stiff.		6	D		63	2.0 to 2.5	NA	<1	
419.0			7							
418.0	Same as above, but 10YR 5/6 yellow brown, 20% to 30% gray mottling, moist, stiff.		8	E		75	1.0	NA	<1	
417.0			9							
416.0	Same as above.		10	F		75	1.0	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-130 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.0 Completion Depth 47.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 9/27/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371773.5 E (Y) 787261 4

Latitude ___ ___ ___ Longitude ___ ___ ___

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414 0	Same as above, trace fine gravel, 5% to 10% black staining, stiff.		12	G		100	1 5 to 2.0	NA	<1	
413 0			13							
412 0	Same as above, <5% black staining, 20% gray mottling, stiff.		14	H		100	1 0 to 1.5	NA	<1	
411 0			15							
410 0	Same as above, no gravel, plastic, 5% to 10% black staining, 10% to 20% gray mottling.		16	I		100	1 0 to 1 5	NA	<1	Change PID for new battery.
409 0			17							
408 0	Same as above, 20% to 30% gray motting, <5% black staining.		18	J		100	1 0 to 1.25	NA	<1	
407 0			19							
406 0	Same as above, very stiff below 21' to 22' bgs.		20	K		96	1.0 to 3.0	NA	<1	
405 0			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-130 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.0 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371773.5 E.(Y) 787261.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but 5% to 10% fine to medium sand between 23' and 24' bgs, and 5% to 10% fine to medium gravel between 23' to 23.5' bgs, moist (not high transmissive zone), stiff.			L		96	1.0 to 2.0	NA	6	PID reading may be background, due to vehicle exhaust.
403.0			23							
402.0	**LEAN CLAY WITH SAND (CL)**, 20% to 30% silt, 20% to 35% sand.		24	M		92	1.5	NA	20	
401.0			25							
400.0	**LEAN CLAY (CL)**, trace silt, trace gravel, low plasticity, 10YR 5/6 yellow brown, uniform color and texture, with some (about 5%) thin fractures (gray), some black staining (<5%), slightly moist, very stiff. (Till)		26	N		92	3.0	NA	12	
399.0			27							
398.0	Same as above, high PID hits at highly fractured areas.		28	O		96	2.0 to 3.0	NA	42	
397.0			29							
396.0	Flakey clay/silt area (yellow brown) from 29.5' to 29.8' bgs.		30	P		50	2.0 to 3.0	NA	32 14	
395.0	Same as above, with long vertical gray fracture, charcoal piece at 31.5' bgs, some isolated pieces of sandstone between 30' and 34' bgs.		31							Refusal at 31' bgs. Remove rods and try again - successful to 34' bgs.
394.0	Same as above.		32	Q		100	2.5 to 3.0	NA	6	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-130 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.0 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date. Start 9/27/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371773.5 E (Y) 787261.4

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
392.0	Same as above, but trace coarse gravel. 5Y 5/2 olive gray, grading to 5Y 5/1 gray with trace fine gravel below 35' bgs, very stiff, flakey from 34' to 34.5' bgs.		34	R		100	2.5 to 3.0	NA	<1	Stop at 34' bgs on 9/27/00. Begin at 34' on 9/28/00.
391.0			35							Below 35' soil looks like Till at Building I-1-23 Area.
390.0	Same as above.		36	S		100	NR	NA	2.5	
389.0	**SILTY SAND (SM)**, 30% silt, increasing to 50% silt with depth, 10YR 5/6 yellow brown, moist, medium dense.		37	T		100	NA	NA	<1	Refusal on first try at 37' bgs. 2' run from 37' to 39' bgs.
388.0	**WELL GRADED SAND (SW)**, fine to medium sand, trace fine to medium gravel, trace silt, 5Y 5/1 gray, wet, loose to medium dense.		38							
387.0			39	U		100	NA	NA	<1	
386.0	Same as above.		40				NA		<1	
385.0	**SILT WITH SAND (ML)**, 20% to 30% very fine sand, 20% to 30% clay, trace gravel, low plasticity, 2.5Y 5/1 gray, moist, very stiff.		41	V		100	3.0 to 4.0	NA	<1	
384.0	**LEAN CLAY (CL)**, with trace gravel, plastic, 5Y 5/1 gray, slightly moist, stiff. (Till)		42				1.0 to 1.5			
383.0	Same as above, but 10YR 5/4 yellow brown, grading to 5Y 5/1 gray, soft, wet.		43	W		100		NA		

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-130 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.0 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/28/00

UTM (or State Plane) Coord. N.(X) 371773.5 E.(Y) 787261.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
							NR		<1	
381.0	**SILTY SAND (SM),** fine sand, 20% to 30% silt, 5Y 5/1 gray, loose to medium dense.		45	X		100		NA	<1	
380.0	**LEAN CLAY (CL),** as at 42 feet bgs.		46				1.0 to 1.5		<1	
379.0	**End of Boring at 47 feet.**		47							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-131 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.7 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/29/00 Finish 9/29/00

UTM (or State Plane) Coord. N.(X) 371802.2 E.(Y) 787399.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	TOPSOIL, 2". **LEAN CLAY (CL)**, 20% to 30% silt, trace fine sand, plastic, brown and gray mottling, no odor, dry, very stiff.			A		100	3.0	NA	<2	
422.7			1							
421.7	Same as above.		2	B		100	3.0	NA	<2	
420.7			3							
419.7	Same as above, dry, stiff, some silt from 4.5' to 5.0' bgs.		4	C		100	1.0	NA	9.3	
418.7			5							
417.7	Same as above, no odor, dry.		6	D		100	2.0	NA	14.0	Duplicate FDUP32/33-025-000929 collected.
416.7			7							
415.7	Same as above, no odor, dry, very stiff, some silt from 9.0' to 9.4' bgs.		8	E		100	2.0 to 2.5	NA	47	Duplicate FDUP32/33-026-000929 collected.
414.7			9							
413.7	Same as above, no odor, dry.		10	F		100	3.0	NA	37.3	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-131 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.7 Completion Depth 48.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/29/00 Finish 9/29/00

UTM (or State Plane) Coord N.(X) 371802.2 E.(Y) 787399.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
411.7	Same as above, no odor, dry, stiff.		12	G		100	1.5	NA	26	
410.7			13							
409.7	Same as above, no odor, dry.		14	H		100	1.0	NA	46	
408.7			15							
407.7	Same as above, trace fine gravel, brown spots (staining).		16	I		100	1.0	NA	44	
406.7			17							
	3" zone with some sand at 17.5' bgs.									
405.7	Same as above, no odor, dry.		18	J		100	1.5	NA	60	
404.7			19							
403.7	Same as above, no gravel.		20	K		100	1.0	NA	47	
402.7	Some silt from 21' to 21.3' and from 22' to 22.4' bgs.		21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-131 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.7 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/29/00 Finish 9/29/00

UTM (or State Plane) Coord. N.(X) 371802.2 E.(Y) 787399.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	2.0	NA	44	
400.7			23							
399.7	**LEAN CLAY (CL)**, as above, but trace gravel, more uniform color and texture, very stiff. (Till)		24	M		100	3.5	NA	19	
398.7			25							
397.7	Same as above, 1" sand seam at 26' bgs.		26	N		100	3.5	NA	49.0	
396.7			27							
	1" sand seam, wet, at 27.5' bgs.									
395.7	Same as above.		28	O		100	3.5	NA	7.0	
394.7			29							
393.7	Same as above.		30	P		100	3.5	NA	7.0	
	1" coarse sand and fine gravel seam, wet, at 30.5' bgs.									
392.7			31							
391.7	Same as above.		32	Q		100	NR	NA	10	
	POORLY GRADED SAND (SP), medium grained, trace fine gravel, 10YR 6/8									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No.: SB-131 — Monitor Well No. _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 423.7 — Completion Depth: 48.0

Fed. ID. No. _____ — Auger Depth _____ — Rotary Depth _____

Quadrangle: SE 1/4 of SW 1/4 — Sec. 32 — T. 9 S — R. 2 E — Date: Start 9/29/00 — Finish 9/29/00

UTM (or State Plane) Coord. N.(X): 371802.2 — E.(Y): 787399.0

Latitude ___ ° ___ ' ___ " — Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - R. Hafermeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	brownish yellow, no odor, wet.									
389.7	Same as above.		34	R		100	NA	NA	11.6	
388.7			35							
	2" clay layer at 35.5' bgs.									
387.7	No recovery.		36	S		0	NA	NA	NR	
386.7			37							
385.7	No recovery.		38	T		0	NA	NA	NR	
384.7			39							
383.7	LEAN CLAY (CL), trace gravel, plastic, 10YR 5/1 gray, uniform color and texture, no odor, moist, stiff. (Till)		40	U		100	1.5	NA	<2	
382.7			41							
381.7	Same as above.		42	V		100	1.5	NA	<2	
380.7			43							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-131 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 423.7 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/29/00 Finish 9/29/00

UTM (or State Plane) Coord. N.(X) 371802.2 E.(Y) 787399.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, no odor.			W		100	1.5	NA	<2	
378.7			45							
377.7	Same as above, no odor.		46	X		100	NR	NA	<2	
376.7	**SANDSTONE**, weathered.		47							
375.7	**End of Boring at 48 feet.** (Refusal)		48							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-132 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 43.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 10/4/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 371562.8 E.(Y) 787212.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	TOPSOIL, 3".		A		100	2.5	NA	<1	
	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, trace gravel, plastic, 10YR 6/8 brownish yellow, no odor, dry, stiff. (Fill)								
425.7		1							
424.7	Same as above.	2	B		100	2.5	NA	<1	
423.7		3							
422.7	Same as above, less gravel, gray mottling.	4	C		100	2.0	NA	<1	
421.7		5							
420.7	Same as above, less gravel, no odor.	6	D		100	2.0	NA	<1	
419.7		7							
418.7	**LEAN CLAY (CL)**, as above, no gravel. (Native)	8	E		100	2.0	NA	<1	
417.7		9							
416.7	Same as above, hard.	10	F		100	4.0	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson Boring No: SB-132 Monitor Well No.: _____

Site File Name: Crab Orchard National Wildlife Refuge Surface Elevation: 426.7 Completion Depth: 43.0

Fed. ID. No.: _____ Auger Depth: _____ Rotary Depth: _____

Quadrangle: NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date: Start 10/4/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 371562.8 E (Y) 787212.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.7	Same as above, no odor, moist, very stiff.		12	G		100	2.0	NA	<1	Trace very fine gravel in QC sample G/H, looks like native soil (Loess).
413.7			13							
412.7	Same as above, no odor, moist.		14	H		100	2.5	NA	<1	
411.7			15							
410.7	Same as above, stiff.		16	I		100	1.0	NA	<1	QC sample I/J looks like native soil (Loess).
409.7			17							
408.7	Same as above.		18	J		100	2.0	NA	<1	
407.7			19							
406.7	SILTY SAND (SM), no odor, wet.		20	K		100	NA	NA	<1	
405.7	LEAN CLAY (CL), as at 18 feet.		21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-132 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 43.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 10/4/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 371562.8 E.(Y) 787212.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, some silt.			L		100	1.0	NA	<1	
403.7			23							
402.7	**LEAN CLAY (CL)**, as above, 20% to 30% silt, trace gravel, very stiff. (Till)		24	M		100	3.0	NA	3	
401.7			25							
400.7	Same as above, no odor, dry, hard.		26	N		100	4.5	NA	<1	
399.7			27							
398.7	Same as above, no odor, moist.		28	O		100	4.0	NA	<1	
397.7			29							
396.7	Same as above, no odor, moist.		30	P		100	4.5	NA	<1	
395.7			31							
394.7	Same as above, no odor, moist.		32	Q		100	4.0	NA	3.1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No: SB-132 — Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 426.7 — Completion Depth: 43.0

Fed. ID. No: _____ — Auger Depth: _____ — Rotary Depth: _____

Quadrangle: NE 1/4 of NW 1/4 — Sec. 5 — T 10 S — R 2 E — Date Start: 10/4/00 — Finish: 10/4/00

UTM (or State Plane) Coord. N (X): 371562.8 — E (Y): 787212.3

Latitude: ___ ° ___ ' ___ " — Longitude: ___ ° ___ ' ___ "

Boring Location: Building I-1-2 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Vertical fracture from 33' to 34' bgs.									
392.7	Same as above.		34	R		100	4.0	NA	3.1	
391.7			35							
390.7	Same as above.		36	S		100	NR	NA	<2	
389.7	**WELL GRADED SAND WITH GRAVEL (SW)**, approximately 50% sand, trace fines, no odor, wet.		37							
388.7	Same as above, no odor.		38	T		100	NA	NA	<2	
387.7			39							
386.7			40	U		100		NA	<2	
385.7	**LEAN CLAY (CL)**, trace gravel, plastic. 10YR 5/1 gray, uniform color and texture, no odor, moist, very stiff. (Till)		41				3.5			
384.7	6" silt at 42' bgs.		42	V		100		NA	<2	
383.7	**End of Boring at 43 feet.** (Refusal)		43							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-133 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.6 Completion Depth 30.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 371244.8 E.(Y) 787522.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	TOPSOIL, 4".			A		100	3.5	NA	<2	
	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, brown and gray mottling, no odor, dry, very stiff.									
425.6			1							
424.6	Same as above, hard.		2	B		100	4.0	NA	<2	
423.6			3							
422.6	Same as above, but 15% to 25% silt, some black/dark brown staining, no odor, dry, very stiff.		4	C		100	3.0	NA	<2	
421.6			5							
420.6	Same as above, no odor, dry.		6	D		100	3.0	NA	<2	
419.6			7							
418.6	Same as above, no odor, dry.		8	E		100	2.5	NA	7.9	
417.6			9							
416.6	Same as above, no odor, dry, stiff.		10	F		100	1.0	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-133 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.6 Completion Depth 30.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 371244.8 E (Y) 787522.2

Latitude ___ ___ ___ Longitude ___ ___ ___

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.6	Same as above.		12	G		100	2.0	NA	<2	
413.6			13							
412.6	Same as above.		14	H		100	2.0	NA	<2	
411.6			15							
410.6			16	I		100	2.0	NA	24	
409.6	**SANDY SILT (ML)**, 10YR 6/8 brownish yellow, no odor, wet, loose.		17							
408.6			18	J		100	0.5	NA	15	
407.6			19							
406.6	**LEAN CLAY (CL)**, 15% to 25% silt, trace fine sand, plastic, brown and gray mottling, no odor, moist, stiff.		20	K		100	1.0	NA	7.4	
405.6			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-133 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.6 Completion Depth 30.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 371244.8 E.(Y) 787522.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, no odor, dry, very stiff.			L		100	2.5	NA	85	
403.6			23							
402.6	**LEAN CLAY (CL)**, as above, some silt, trace gravel, brown, uniform color and texture. (Till)		24	M		100	4.5	NA	5	
401.6			25							
400.6	Same as above, no odor, dry, coal chunks.		26	N		100	4.5	NA	12	Duplicate FDUP32/33-036-001003 collected.
399.6			27							
398.6	**POORLY GRADED SAND (SP)**, no odor, wet.		28	O		100	2.5	NA	17	
	LEAN CLAY (CL), as at 24' bgs, no odor, dry.									
397.6			29							
396.6	**SANDSTONE**, weathered.		30							
	End of Boring at 30 feet. (Refusal)									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-134 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 30.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 10/17/00 Finish 10/17/00

UTM (or State Plane) Coord. N.(X) 371175.3 E.(Y) 787553.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20% to 30% silt, 5% fine to coarse sand, plastic, 10YR 6/6 brownish yellow, no odor, wet, medium stiff to stiff. (Fill)			A		100	0.7 to 3.8	NA	<2	
425.7	Cobbles from 0.5' to 1.0' bgs.		1							
424.7	**LEAN CLAY (CL)**, but 10YR 5/1 gray, stiff. (Native)		2	B		100	1.5 to 2.0	NA	<2	
423.7			3							
	Varies in color from brownish yellow to gray above.									
422.7	Same as above, medium stiff to very stiff.		4	C		100	0.7 to 2.2	NA	<2	
421.7			5							
420.7	Same as above, very soft to stiff.		6	D		100	<2 to 1.8	NA	<2	
419.7			7							
418.7	Same as above, very soft to very stiff.		8	E		71	<2 to 2.4	NA	<2	
417.7			9							
416.7	Same as above, very stiff.		10	F		79	2.0 to 2.2	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-134 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 30.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date: Start 10/17/00 Finish 10/17/00

UTM (or State Plane) Coord. N.(X) 371175.3 E (Y) 787553.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
414.7	LEAN CLAY (CL), 10% to 20% silt, trace fine sand, plastic to non-plastic, mottled 10YR 7/1 light gray and 10YR 6/6 brownish yellow, some small (mm scale) black zones, no odor, moist, stiff to very stiff. (Loess)		12	G		100	1.5 to 3.3	NA	<2	
413.7			13							
412.7	Same as above, stiff.		14	H		100	1.0 to 2.0	NA	<2	
411.7			15							
410.7	Same as above, medium stiff to stiff.		16	I		100	0.7 to 1.9	NA	<2	
409.7			17							
408.7	Same as above, medium stiff to very stiff.		18	J		100	0.8 to 2.5	NA	<2	
407.7			19							
406.7	LEAN CLAY (CL), as above, varies more in silt content from 5% to 40%, occasional pebble, 5% to 10% fine to medium sand, very soft to stiff. (Till)		20	K		100	0.2 to 1.8	NA	2	
405.7			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-134 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 426.7 Completion Depth 30.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 10/17/00 Finish 10/17/00

UTM (or State Plane) Coord. N.(X) 371175.3 E.(Y) 787553.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-2 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, very stiff to hard.			L		100	2.2 to 4.3	NA	4	
403.7			23							
402.7	Same as above, trace to 10% fine gravel, more uniform color.		24	M		100	3.2 to 4.1	NA	4	
401.7			25							
400.7	Same as above, stiff to very stiff.		26	N		100	1.3 to 3.2	NA	10	Includes volume for MS/MSD.
399.7			27							
398.7			28	O		75	0.9 to 2.8	NA	9	
	SANDSTONE, weathered, fine sand, 20% to 30% silt, 10YR 7/8 yellow, no odor, moist.									
397.7			29							
396.7	**End of Boring at 30 feet.** (Refusal)		30							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-200 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.2 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 373963.5 E.(Y) 786455.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, trace gravel, low plasticity, light yellowish brown 2.5Y 6/3, dry, flakey, stiff. (Fill)		A		96	1.0 to 2.0	NA	<1	
421.2		1							
420.2	Same as above, but more cohesive, 10%-20% silt, low to medium plasticity, dry, not flakey, very stiff.	2	B		96	2.5 to 2.75	NA	<1	
419.2		3							
418.2	Same as above, but yellowish brown 10YR 5/6, with gray mottling interspersed, some gray areas are wide spread and have lower stiffness and more water, some black staining.	4	C		100	1.5 to 2.5	NA	<1	
417.2		5							
416.2		6	D		100	2.0 to 2.5	NA	<1	
415.2	Light olive gray 5Y 6/2, soft at 7.0' to 7.3' bgs.	7							
414.2	**LEAN CLAY (CL)**, as above, moderately wet, stiff, gray areas correspond to lower stiffness. (Native)	8	E		96	1.5 to 2.0	NA	11	PID malfunction. PID reading in ambient air is 11 to 12 ppm.
413.2		9							
412.2	Same as above, stiff.	10	F		96	1.5 to 2.0	NA	11	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-200 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.2 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 373963.5 E (Y) 786455.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pilsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
410.2	SILTY SAND (SM), 20%-30% silt, dark yellowish brown 10YR 4/6, wet, loose to medium dense.		12	G		96	0.5 to 1.25	NA	<1	
409.2	LEAN CLAY (CL), as above at 8' to 12' bgs, stiff, but increasing gray nodes and increasing stiffness below 15.2' bgs.		13							
408.2			14	H		96	1.5 to 2.0	NA	<1	
407.2			15							
406.2	Same as above, but stiff with black staining, very stiff.		16	I		100	3.0	NA	<1	
405.2			17							
404.2	Same as above.		18	J		100	2.0 to 2.75	NA	<1	
403.2			19							
402.2	Same as above, stiff.		20	K		NR	1.5	NA	<1	Lab sample collected from above silt.
401.2			21							
	SILT (ML), 10%-20% fine sand, trace									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-200 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.2 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 373963.5 E.(Y) 786455.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	clay, yellowish brown 10YR 5/6, wet, gray mottling, loose to medium dense, extensive (mostly vertical) fractures, increasing sand with depth (up to 20%-30%).			L		NR	<0.5	NA	<1	
399.2			23							
398.2	**SILTY SAND (SM),** 40%-50% silt, yellowish brown 10YR 5/6, wet, loose to medium dense.		24	M		100	NA	NA	<1	
397.2			25							
396.2			26	N		100	NA	NA	<1	
395.2			27							
394.2	**POORLY GRADED SAND (SP),** fine to medium sand, <10% silt, yellowish brown 10YR 5/6, wet, loose.		28	O		54	NA	NA	<1	
	Same as above.									
393.2			29							
392.2	Same as above, but medium to coarse sand.		30	P		54	2.0	NA	<1	
391.2			31							
390.2	**LEAN CLAY (CL),** 10%-20% silt, trace gravel, yellowish brown 10YR 5/6, grading to gray 2.5Y 5/1, stiff. (Till)		32	Q		NR	1.0 to 1.5	NA	NR	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-200 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.2 Completion Depth 36.0

Fed. ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date. Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 373963.5 E.(Y) 786455.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but gray 2.5Y 5/1, increasing sand with depth.									
388.2			34	R		NR	1.0 to 1.5	NA	NR	
387.2			35							
386.2	POORLY GRADED SAND (SP), yellowish brown 10YR 5/4, moderately wet, loose. End of Boring at 36 feet.		36							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-201 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.6 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 373973.6 E.(Y) 786430.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, light yellowish brown 2.5Y 6/3, dry, flakey, very stiff.			A		100	2.0 to 3.0	NA	84	Grass at the surface.
420.6			1							
419.6	Same as above, but 10%-20% silt, more cohesive (not flakey), low to medium plasticity, stiff		2	B		100	1.5 to 2.0	NA	358	
418.6			3							
417.6	Same as above, but yellowish brown 10YR 5/6 with extensive gray mottling, shown as vertical fractures, lower stiffness in gray areas, black staining, stiff.		4	C		100	1.5 to 1.75	NA	299	
416.6			5							
415.6	Same as above, moderately wet, stiff to very stiff.		6	D		100	1.5 to 2.25	NA	404	
414.6			7							
413.6	Same as above, very stiff.		8	E		100	2.25	NA	234	
412.6			9							
411.6	Same as above, stiff to very stiff.		10	F		100	1.5 to 2.25	NA	323	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-201 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.6 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R 2 E Date Start 9/18/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 373973.6 E (Y) 786430.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
409.6	Same as above, decreasing stiffness.		12	G		100	1.0	NA	299	
408.6	**SILTY SAND (SM)**, 20%-30% silt, 5% clay, dark yellowish brown 10YR 4/6, wet, medium density.		13							
407.6			14	H		100		NA	334	
406.6	**LEAN CLAY (CL)**, same as at 8' to 13' bgs, very stiff.		15				2.5 to 3.0			
405.6	Same as above, stiff to very stiff.		16	I		100	1.5 to 2.25	NA	184	
404.6			17							
403.6	Same as above, stiff, but less stiff between 18' to 18.5' bgs, extensive gray fractures.		18	J		100	1.0 to 1.5	NA	98	
402.6			19							
401.6	Same as above.		20	K		100	1.0 to 2.0	NA	47	
400.6			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-201 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.6 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 373973.6 E.(Y) 786430.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, with increasing amounts of silt and sand, decreasing stiffness to medium stiff, wet.			L		100	0.25 to 0.75	NA	13	
398.6			23							
	SILTY SAND (SM), fine sand, 15%-25% silt, yellowish brown 10YR 5/6, wet, loose.									
397.6	Same as above.		24	M		75	NA	NA	2	
396.6			25							
395.6			26	N		75	NA	NA	5	
394.6			27							
	POORLY GRADED SAND (SP), fine sand, trace silt, yellowish brown 10YR 5/6, wet, loose to medium dense, wet.									
393.6			28	O		46	NA	NA	<1	
392.6	Same as above, but medium sand, loose, increasing to coarse sand with depth.		29							
391.6			30	P		46	NA	NA	<1	
390.6	Same as above, but abrupt shift to fine sand at 31.8' bgs, with 10% silt.		31							
389.6			32	Q		100	0.5	NA	<1	
	SILT (ML), 20%-30% sand, low plasticity, yellowish brown 10YR 5/6, wet.									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-201 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.6 Completion Depth 47.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date: Start 9/18/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 373973.6 E (Y) 786430.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
387.6	LEAN CLAY (CL), 5%-10% silt, trace gravel, medium plasticity, gray 2.5Y 5/1, moderately wet, stiff. (Till)		34	R		100	1.0 to 2.0	NA	<1	
386.6			35							
385.6			36	S		100		NA	<1	
	End of boring at 37 feet on 9/18/00. Moved 2 feet continued 37-47 feet on 10/2/00.									
384.6	LEAN CLAY (CL), 5%-10% silt, trace fine sand, trace gravel, trace fine sand, plastic, dark gray 5Y 4/1, moist, medium stiff, uniform color and texture. (Till)		37			100	0.5 to 0.75		<1	End of Boring at 37' on 9/18/00. New boring at same location sampled from 37' to 47' on 10/2/00.
383.6	Same as above, stiff.		38	T		100	1.5	NA	<1	
382.6			39							
381.6	SILT (ML), 10%-20% clay, non-plastic, dark gray 5Y 4/1, low moisture, very stiff.		40	U		100	2.5 to 3.5	NA	<1	
380.6			41							
	LEAN CLAY (CL), same as at 37' to 40' bgs, very stiff. (Till)									
379.6			42	V		100	0.5 to 0.75	NA	<1	
378.6	Same as above, medium stiff.		43							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-201 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.6 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 373973.6 E.(Y) 786430.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, trace sand (pockets).			W		100	0.75	NA	<1	
376.6			45							
375.6			46	X		100	0.5	NA	<1	
374.6	**End of Boring at 47 feet.**		47							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-202 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.7 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 373998.6 E.(Y) 786415.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, light yellowish brown 2.5Y 6/3, dry, flakey. (Fill)			A		100	NR	NA	<1	
420.7			1							
419.7	**LEAN CLAY (CL),** as above, 10%-20% silt, slightly more plastic. (Native)		2	B		100	NR	NA	192	
418.7	Turns to gray 5Y 5/1 below 3.5' bgs, solvent odor.		3							
417.7	Same as above, but color changes to yellowish brown 10YR 5/6 at 5.5' to 6' bgs, stiff to very stiff, solvent odor.		4	C		100	1.5 to 2.5	NA	284	Change PID, dead battery.
416.7			5							
415.7	Same as above, but light yellowish brown 2.5Y 6/3, very stiff, soft between 6' to 7' bgs.		6	D		100	0.5 to 3.0	NA	357	
414.7	Becoming gray 5Y 5/1, below 7' bgs, stiff.		7							
413.7	Same as above, still a solvent odor, stiff.		8	E		100	1.0 to 1.5	NA	407	
412.7			9							
411.7	Same as above, but becoming more yellowish brown 10YR 5/6 with gray mottling, stiff to very stiff, moderately wet, black staining.		10	F		100	1.5 to 3.0	NA	628	Duplicate FDUP32/33-012-000918 collected.

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson — Boring No: SB-202 — Monitor Well No.: _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 421.7 — Completion Depth: 37.0

Fed ID No: _____ — Auger Depth: _____ — Rotary Depth: _____

Quadrangle: NW 1/4 of SW 1/4 — Sec. 32 — T 9 S — R 2 E — Date Start: 9/18/00 — Finish: 9/18/00

UTM (or State Plane) Coord. N (X): 373998.6 — E (Y): 786415.7

Latitude: ___ ° ___ ' ___ " — Longitude: ___ ° ___ ' ___ "

Boring Location: Building I-1-23 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL:
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
409.7	Same as above, gray mottling (fractures) correspond to highest PID hits, very stiff.		12	G		100	2.0 to 3.0	NA	520	
408.7			13							
407.7	Same as above.		14	H		100	2.0	NA	241	
406.7			15							
405.7	Same as above, but very stiff.		16	I		100	2.75 to 3.25	NA	298	
404.7			17							
403.7	Same as above, but stiff to very stiff.		18	J		100	1.75 to 2.25	NA	173	Duplicate FDUP32/33-013-000918 collected.
402.7			19							
401.7			20	K		100	1.0 to 1.5	NA	40	
400.7	SILT (ML), trace sand, trace clay, medium plasticity, yellowish brown 10YR 5/6, some black staining, wet, stiff, some gray fractures.		21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-202 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.7 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 373998.6 E.(Y) 786415.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				L		100	NR	NA	48	
398.7	**SILTY SAND (SM)**, fine sand, 30%-40% silt, trace clay, yellowish brown 10YR 5/6, some black staining, loose to medium dense, wet.		23							
397.7	Same as above, increasing sand with depth.		24	M		63	NA	NA	25	
396.7	**POORLY GRADED SAND (SP)**, fine sand, 10%-20% silt, trace gravel, yellowish brown 10YR 5/6, wet, loose.		25							
395.7			26	N		63	NA	NA	63	
394.7	Same as above, but decreasing silt with depth.		27							
393.7	Same as above, but fine to medium sand, trace silt.		28	O		50	NA	NA	<1	
392.7			29							
391.7	Same as above, but brown 10YR 5/3 below 31' bgs.		30	P		50	NA	NA	<1	
390.7			31							
389.7	Same as above.		32	Q		83	NA	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-202 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.7 Completion Depth 37.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 373998.6 E (Y) 786415.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pilsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
387.7			34	R		83	1.0 to 1.5	NA	<1	
386.7			35							
385.7	LEAN CLAY (CL), 10%-20% silt, trace gravel, medium plasticity, gray 2.5Y 5/1, moderately wet, stiff. (Till)		36	S		NR	NR	NA	NR	
384.7	End of Boring at 37 feet.		37							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-203 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 373981.8 E.(Y) 786402.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, brown 10YR 5/3, dry, hard. (Native)			A		100	>3.0	NA	<1	Grass at the surface.
420.0			1							
419.0	Same as above, but with shades of gray, medium plasticity, very stiff.		2	B		100	2.5	NA	<1	
418.0			3							
417.0	Same as above, but turns to gray 2.5Y 5/1 between 5' to 6.5' bgs, stiff.		4	C		100	1.0 to 1.5	NA	6	
416.0			5							
415.0	Same as above, but yellowish brown 10YR 5/6, some gray mottling, stiff, moderately wet.		6	D		100	1.5 to 1.75	NA	226	
414.0			7							
413.0	Same as above, extensive fracturing (as evidenced by gray vertical lines), stiff to very stiff.		8	E		NR	2.0 to 2.5	NA	106	Change PID, dead battery.
412.0			9							
411.0	Same as above.		10	F		NR	1.5 to 2.5	NA	145	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-203 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 37.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 373981.8 E (Y) 786402.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
409.0	Same as above, very stiff.		12	G		100	2.0 to 2.75	NA	180	
408.0			13							
407.0	Same as above.		14	H		100	2.75	NA	169	
406.0			15							
405.0	Same as above, stiff to very stiff.		16	I		100	1.5 to 2.5	NA	92	
404.0			17							
403.0	Same as above, stiff, but decreasing stiffness with depth.		18	J		100	1.5 to 2.0	NA	94	
402.0			19							
401.0	SILT (ML), yellowish brown 10YR 5/6, soft, gray fracture lines evident, increasing sand with depth.		20	K		NR	0.5	NA	53	
400.0			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-203 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 373981.8 E.(Y) 786402.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILTY SAND (SM), yellowish brown 10YR 5/6, wet, loose, gray fracture lines evident.			L		NA	NA	NA	54	
398.0			23							
397.0			24	M		58	NA	NA	15	
396.0	**POORLY GRADED SAND WITH SILT (SP-SM)**, fine sand, 20%-30% silt, yellowish brown 10YR 5/6, wet, loose, increasing grainsize with depth.		25							
395.0	Same as above, but fine to medium sand below 27' bgs.		26	N		58	NA	NA	17	
394.0			27							
393.0	Same as above, but medium sand, light brownish gray 2.5Y 6/2.		28	O		58	NA	NA	<1	
392.0			29							
391.0	Same as above.		30	P		58	NA	NA	<1	
390.0			31							
389.0	**SILT (ML)**, 10% clay, gray 2.5Y 5/1, wet, decreasing silt with depth.		32	Q		NR	NA	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-203 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 37.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N (X) 373981.8 E (Y) 786402.3

Latitude ___ ___ ___ Longitude ___ ___ ___

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
387.0	LEAN CLAY (CL), 20%-30% silt, trace gravel, dark gray 2.5Y 4/1, uniform color and texture, moderately wet, stiff to very stiff. (Till)		34	R		NR	2.0 to 2.5	NA	<1	
386.0			35							
385.0			36			NR	NR	NA	NR	
384.0	End of Boring at 37 feet.		37							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-204 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.8 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 373996.4 E.(Y) 786380.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	TOPSOIL, 3". (Fill)			A		100	NR	NA	<2	
419.8	**LEAN CLAY (CL)**, 20% to 30% silt, trace fine sand, trace fine gravel, plastic, brownish yellow 10YR 6/8, no odor, moist, hard. (Fill)		1							
418.8	Same as above, with gray mottling, but with brick pieces, stiff.		2	B		100	NR	NA	<2	
417.8			3							
416.8	Same as above, no odor, stiff to very stiff.		4	C		100	NR	NA	<2	
415.8			5							
414.8	Same as above, no odor, stiff.		6	D		100	NR	NA	<2	
413.8			7							
412.8	**LEAN CLAY (CL)**, as above, some black staining, no odor, stiff to very stiff. (Native)		8	E		100	NR	NA	<2	QC sample E/F starts to look like native soil.
411.8			9							
410.8	Same as above, no odor, stiff.		10	F		100	NR	NA	<2	
409.8			11							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No.: SB-204 — Monitor Well No. _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 420.8 — Completion Depth: 44.0

Fed. ID No. _____ — Auger Depth _____ — Rotary Depth _____

Quadrangle: NW 1/4 of SW 1/4 — Sec. 32 T 9 S R 2 E — Date: Start 9/26/00 — Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 373996.4 E (Y) 786380.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-23 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), plastic, gray and yellow brown mottling, no odor, moist, very stiff.			G		100	NR	NA	<2	
407.8			13							
406.8	Same as above.		14	H		100	NR	NA	<2	
405.8			15							
404.8	Same as above.		16	I		100	NR	NA	<2	
403.8			17							
402.8	Same as above, stiff.		18	J		100	NR	NA	<2	
401.8			19							
400.8	Same as above.		20	K		83	NR	NA	<2	
399.8			21							
398.8	**SANDY SILT (ML)**, 30% sand, brownish yellow 10YR 6/8, no odor, wet.		22	L		100	NR	NA	<2	
397.8			23							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-204 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.8 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 373996.4 E.(Y) 786380.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILTY SAND (SM), 30% to 40% silt, brownish yellow 10YR 6/8, wet, no odor.			M		83	NA	NA	<2	
395.8			25							
	POORLY GRADED SAND (SP), fine grained, 5% to 10% silt, brownish yellow 10YR 6/8, no odor, wet.									
394.8			26	N		100	NA	NA	<2	
393.8			27							
392.8	Same as above, but with coarse sand, little fine gravel.		28	O		100	NA	NA	<2	
391.8			29							
390.8	Same as above.		30	P		100	NA	NA	<2	
389.8	Medium gravel at 31.5' bgs.		31							
388.8	Same as above, but fine to medium sand, trace fine gravel.		32	Q		100	NA	NA	<2	
387.8	**SANDY SILT (ML),** 30% fine sand, gray 10YR 5/1, no odor, wet, some brown mottling.		33							
386.8	Same as above.		34	R		50	NA	NA	<2	
385.8			35							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No: SB-204 — Monitor Well No. _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 420.8 — Completion Depth: 44.0

Fed ID No _____ — Auger Depth _____ — Rotary Depth _____

Quadrangle: NW 1/4 of SW 1/4 — Sec 32 T 9 S R 2 E — Date Start: 9/26/00 — Finish: 9/26/00

UTM (or State Plane) Coord. N.(X): 373996.4 — E (Y): 786380.1

Latitude ___ ° ___ ' ___ " — Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-23 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			S		100	NA	NA	<2	
383.8			37							
382.8	Same as above.		38	T		100	NA	NA	<2	
381.8			39							
380.8	Same as above.		40	U		100	NR	NA	<2	
379.8	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, trace fine gravel, plastic gray 10YR 5/1, uniform color and texture, no odor, dry, very stiff. (Till)		41							
378.8	Same as above.		42	V		100	NR	NA	<2	
377.8			43							
376.8	End of Boring at 44 feet.		44							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-205 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.6 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 374022.0 E.(Y) 786326.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-20% silt, trace fine sand, low plasticity, brown 10YR 5/3, dry, very stiff. (Native)			A		100	3.0 to 3.5	NA	<1	
419.6	Increasing moisture and medium plasticity below 1' bgs, medium stiff.		1							
418.6	Same as above, but light yellowish brown 10YR 6/4 below 2' bgs, with gray mottling, stiff to very stiff.		2	B		100	1.3 to 2.75	NA	<1	
417.6			3							
416.6	Same as above, medium stiff, yellowish brown 10YR 5/6.		4	C		100	1.0 to 2.25	NA	<1	
415.6			5							
414.6	Same as above, low to medium plasticity.		6	D		100	2.0 to 2.25	NA	<1	
413.6			7							
412.6	Same as above, medium plasticity, stiff, moderately wet.		8	E		100	1.0 to 1.5	NA	4	
411.6			9							
410.6	Same as above, with black staining below 10' bgs.		10	F		100	1.0 to 1.5	NA	1.0	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-205 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.6 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 374022.0 E (Y) 786326.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408.6	Same as above, stiff to very stiff.		12	G		100	1.5 to 2.5	NA	<1	
407.6			13							
406.6	Same as above, very stiff.		14	H		100	2.0 to 3.5	NA	<1	
405.6			15							
404.6	Same as above, stiff.		16	I		100	0.5 to 1.5	NA	<1	
403.6			17							
402.6	Same as above, stiff to very stiff.		18	J		100	1.0 to 2.5	NA	<1	
401.6	Black staining below 19' bgs.		19							
400.6	Same as above, little black staining, increasing sand with depth, stiff.		20	K		100	1.0 to 2.0	NA	3	Sample K collected above silty sand (SM).
399.6			21							
	SILTY SAND (SM), 20%-30% silt, 5%-10% clay, yellowish brown 10YR 5/6.									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-205 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.6 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 374022.0 E.(Y) 786326.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	wet, medium dense.			L		100	NA	NA	1.0	
397.6			23							
396.6	Same as above.		24	M		100	NA	NA	<1	
395.6			25							
394.6	Same as above.		26	N		100	NA	NA	<1	
393.6	Trace gravel between 27.3' to 27.5' bgs.		27							
392.6	Same as above, no clay, increasing sand with depth, light olive brown 2.5Y 5/4.		28	O		100	NA	NA	<1	
391.6	**POORLY GRADED SAND (SP)**, fine to medium sand, trace silt, trace coarse sand, light olive brown 2.5Y 5/4, wet, loose.		29							
390.6			30	P		100		NA	<1	
	SILT (ML), 10%-20% clay, 10%-20% sand, light olive brown 2.5Y 5/4, some gray fractures, soft to medium stiff.									
389.6			31							
							0.5 to 1.0			
388.6			32	Q		NR	1.0	NA	<1	
	LEAN CLAY (CL), 40%-50% silt, trace fine sand, medium plasticity, gray 5Y 5/1,									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No.		County: Williamson	Boring No: SB-205
Site File Name	Crab Orchard National Wildlife Refuge	Surface Elevation	420.6
Fed. ID No.		Auger Depth	
Quadrangle	NW 1/4 of SW 1/4	Sec. 32 T. 9 S R 2 E	Date: Start 9/20/00
UTM (or State Plane) Coord. N.(X)	374022.0	E.(Y) 786326.7	
Latitude	- - -	Longitude	- - -
Boring Location	Building I-1-23 Area		
Drilling Equipment	Geoprobe 55DT Truck		

Monitor Well No: ____
Completion Depth: 37.0
Rotary Depth: ____
Finish: 9/20/00

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	uniform color and texture, wet, stiff.									
386.6	Same as above.		34	R		NR	1.0	NA	<1	
385.6			35							
384.6	**SILTY SAND (SM)**, fine sand, trace clay, gray 5Y 5/1, wet, loose to medium dense.		36	S		NR	NR	NA	NR	
383.6	**End of Boring at 37 feet.**		37							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-206 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.6 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374004.7 E.(Y) 786345.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, yellowish brown 10YR 5/4, dry, stiff to very stiff, but flakey. (Fill)			A		100	1.5 to 3.0	NA	<1	
419.6			1							
418.6	Same as above, but 10%-20% silt, trace gravel, yellowish brown 10YR 5/6, low to medium plasticity, gray mottling, black staining.		2	B		100	1.5	NA	<1	
417.6			3							
416.6	Same as above, with gray 10YR 5/1 areas interspersed, gray areas are soft and moderately wet, other areas stiff.		4	C		83	1.0 to 1.25	NA	<1	
415.6			5							
414.6	Same as above, medium stiff, moderately wet.		6	D		83	0.5 to 1.0	NA	<1	
413.6			7							
412.6	Same as above.		8	E		63	0.5	NA	<1	
411.6			9							
410.6	Same as above.		10	F		63	0.5	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-206 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.6 Completion Depth 47.0

Fed. ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374004.7 E (Y) 786345.6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408.6	Same as above, with trace sand, mostly grayish brown 2.5Y 5/2, wet, soft.		12	G		83	<0.5	NA	<1	
407.6			13							
406.6	LEAN CLAY (CL), 10%-20% silt, trace fine sand, low to medium plasticity, yellowish brown 10YR 5/6, moderately wet, stiff to very stiff, gray vertical fractures, black staining. (Native)		14	H		83	1.75 to 2.5	NA	<1	
405.6			15							
404.6	Same as above.		16	I		100	1.5 to 2.25	NA	1	
403.6			17							
402.6	Same as above.		18	J		100	1.25 to 1.5	NA	1	
401.6			19							
400.6	Same as above, decreasing stiffness to soft.		20	K		100	1.0 to 2.5	NA	1	
399.6	Yellowish brown 10YR 5/4 with much black staining, soft, between 21' to 22' bgs.		21							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-206 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.6 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374004.7 E.(Y) 786345.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as at 18' to 21' bgs, increasing sand.			L		100	1.0 to 2.0	NA	1	Sample L collected above silty sand (SM).
397.6			23							
396.6	**SILTY SAND (SM)**, 30%-40% silt, trace clay, yellowish brown 10YR 5/6, wet, medium dense. Same as above, with pockets of clay, loose.		24	M		83	<0.5	NA	2	
395.6			25							
394.6	Same as above, increasing fine sand with depth.		26	N		83	NA	NA	3	
393.6	**POORLY GRADED SAND WITH SILT (SP-SM)**, fine sand, 10%-20% silt, yellowish brown 10YR 5/6, wet, loose, silt decreasing with depth to trace silt at 27.8' bgs, color grading to brownish yellow 10YR 6/6.		27							
392.6			28	O		63	NA	NA	<1	
391.6	Increasing grain size to medium sand, with trace gravel between 29' to 30' bgs.		29							
390.6	High silt content between 30' to 30.5' bgs, light olive brown 2.5YR 6/3 between 30-31 feet, all fine to medium sand (trace silt) below 30.5' bgs, color changes to yellowish brown 10YR 5/6 below 31' bgs.		30	P		63	NA	NA	<1	
389.6			31							
388.6	Coarse sand, trace silt between 32' to 33' bgs, dark yellowish brown 10YR 4/6.		32	Q		67	1.5 to 2.5	NA	<1	5' sample run from 32' to 37' bgs.

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-206 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.6 Completion Depth 47.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374004.7 E (Y) 786345.6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 30%-40% silt, trace sand, medium plasticity, brown 10YR 5/3, wet, stiff to very stiff.									
386.6			34	R		67	NR	NA	<1	
385.6	**POORLY GRADED SAND (SP)**, fine sand, grading to coarse sand, trace silt, brown 10YR 5/3, wet, loose.		35							
384.6			36	S		100	NA	NA	<1	
383.6	**WELL GRADED SAND (SW)**, fine to coarse sand, trace gravel, dark grayish brown 2.5Y 4/2, wet, loose.		37							5' sample run from 37' to 42' bgs.
382.6	**LEAN CLAY (CL)**, 10% silt, trace gravel, medium plasticity, gray 5Y 5/1, wet, medium stiff, increasing sand with depth. (Till)		38	T		100	1.0 to 1.25	NA	<1	
381.6			39							
380.6	**POORLY GRADED SAND (SP)**, medium sand, trace silt, trace gravel, gray 5Y 5/1, wet, very loose.		40	U		100	NA	NA	29	
379.6	Same as above.		41							
378.6	**WELL GRADED SAND (SW)**, fine to coarse sand, 10%-20% medium to coarse gravel, trace silt, olive gray 5Y 5/2, wet, loose, solvent odor.		42	V			NA	NA	307	
377.6			43							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-206 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.6 Completion Depth 47.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374004.7 E.(Y) 786345.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), as at 38' to 39.5' bgs, but soft to medium stiff. (Till)			W		NR	0.5 to 1.0	NA	86	
375.6			45							
374.6			46	X		NR	NR	NA	<1	
373.6	**End of Boring at 47 feet.**		47							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-207 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.5 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 373961.0 E.(Y) 786360.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-20% silt, trace fine sand, low to medium plasticity, yellowish brown 10YR 5/4, dry, stiff, increasing moisture with depth. (Fill)			A		100	1.0 to 1.5	NA	<1	
419.5			1							
418.5	Same as above, dry, very stiff.		2	B		100	2.0 to 2.5	NA	<1	
417.5			3							
416.5	Same as above, medium stiff to stiff.		4	C		96	0.75 to 1.25	NA	<1	
415.5			5							
414.5	Same as above, but stiff to very stiff, (but gray 2.5Y 5/1 at 6.5' to 7.5' bgs with trace gravel, loose).		6	D		96	2.0 to 3.0	NA	<1	
413.5			7							
412.5	**LEAN CLAY (CL),** as above, but with light brownish gray areas 2.5Y 6/2 and some black staining, low to medium plasticity, wet. (Native)		8	E		100	2.0 to 2.5	NA	<1	
411.5			9							
410.5	Same as above.		10	F		100	1.75 to 3.0	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-207 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.5 Completion Depth 37.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord N.(X) 373961.0 E (Y) 786360.2

Latitude ___ ___ ___ Longitude ___ ___ ___

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408 5	Same as above, stiff to very stiff		12	G		88	1.75 to 2 5	NA	<1	
407 5			13							
406 5	Same as above, very stiff.		14	H		88	3 0	NA	<1	
405 5			15							
404 5	Same as above, stiff.		16	I		100	1.5 to 2 0	NA	<1	
403 5			17							
402 5	Same as above, but with 30%-40% silt and 10% very fine sand, soft, very plastic, wet.		18	J		100	0.5	NA	<1	
401 5			19							
400 5	SANDY SILT (ML), 20%-40% fine sand, trace clay, brown 10YR 5/3, wet, soft.		20	K		100	NA	NA	<1	
399 5			21							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-207 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.5 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 373961.0 E.(Y) 786360.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				L		100	NA	NA	<1	
397.5	**SILTY SAND (SM),** fine sand, 20% silt, yellowish brown 10YR 5/4, wet, loose.		23							
396.5	**POORLY GRADED SAND (SP),** medium sand, trace silt, yellowish brown 10YR 5/6, wet, loose.		24	M		50	NA	NA	<1	
395.5			25							
394.5			26	N		50	NA	NA	<1	
393.5	Grading to yellowish brown 10YR 5/4 below 27.5' bgs.		27							
392.5	Same as above, but coarse sand, brown 10YR 5/3.		28	O		54	NA	NA	<1	
391.5			29							
390.5	Same as above, with trace gravel.		30	P		54	NA	NA	<1	
389.5			31							
388.5	Same as above, but fine sand, no gravel, increasing clay and silt with depth.		32	Q		NR	NA	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No.		County	Williamson
Boring No	SB-207	Monitor Well No	
Site File Name	Crab Orchard National Wildlife Refuge	Surface Elevation	420.5
Completion Depth	37.0	Fed. ID. No.	
Auger Depth		Rotary Depth	
Quadrangle	NW 1/4 of SW 1/4	Sec. 32 T 9 S R 2 E	
Date Start	9/17/00	Finish	9/17/00
UTM (or State Plane) Coord. N.(X)	373961.0	E (Y)	786360.2
Latitude	° ' "	Longitude	° ' "
Boring Location	Building I-1-23 Area		
Drilling Equipment	Geoprobe 55DT Truck		

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
386.5	LEAN CLAY (CL), 20%-30% silt, trace gravel, plastic, gray 10YR 5/1, stiff. (Till)		34	R		NR	1.0	NA	<1	
385.5			35							
384.5			36	S		NR	NR	NA	NR	
383.5	End of Boring at 37 feet.		37							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-208 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.2 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 373996.1 E.(Y) 786330.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-20% silt, trace fine sand, medium to high plasticity, brown 10YR 5/3, moderately wet, stiff. (Fill)			A		54	1.0	NA	<1	Grass at the surface.
419.2			1							
418.2	Same as above.		2	B		54	1.0	NA	<1	
417.2			3							
416.2	Same as above, medium stiff.		4	C		71	0.75 to 1.0	NA	<1	
415.2			5							
414.2	Same as above, increasing gray mottling, fractures, stiff to very stiff, more olive gray 5Y 4/2 between 7' to 7.5' bgs.		6	D		71	1.0 to 2.25	NA	<1	
413.2			7							
412.2	Same as above, with pieces of red brick, very stiff.		8	E		75	3.0 to 3.5	NA	1	
411.2			9							
410.2	Same as above, no brick, stiff.		10	F		75	1.5	NA	37	Duplicate FDUP32/33-014-000919 collected.

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-208 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.2 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 373996.1 E.(Y) 786330.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408.2	Same as above, but very soft, grayish brown 2.5Y 5/2, very wet.	12	G		42	NR	NA	<1	
407.2		13							
406.2		14	H		42	NR	NA	<1	
405.2		15							
404.2	LEAN CLAY (CL), as at 10' to 11' bgs, but 10YR 5/3 brown, wet, stiff. (Native)	16	I		50	NR	NA	1	
403.2		17							
402.2	POORLY GRADED SAND (SP), trace silt, 10YR 5/3 brown, wet, loose.	18	J		50	1.0	NA	8	PID hit is from the sand zone.
401.2	LEAN CLAY (CL), same as at 10' to 11' bgs, but with black stains and gray mottling, fractures, stiff.	19							
400.2	Same as above, very plastic, wet, medium stiff.	20	K		83	0.5 to 1.0	NA	3	
399.2	SANDY SILT (ML), 30%-40% sand, 10% clay, yellowish brown 10YR 5/6, wet.	21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-208 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.2 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 373996.1 E.(Y) 786330.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, increasing sand with depth.			L		83	NA	NA	4	
397.2			23							
396.2	**SILTY SAND (SM),** 40% to 50% silt, trace clay, medium dense.		24	M		100	NA	NA	1	
395.2			25							
394.2	Same as above.		26	N		100	NA	NA	1	
393.2			27							
392.2	**POORLY GRADED SAND (SP),** trace gravel, trace silt, brown 10YR 5/3, wet, loose.		28	O		NR	NA	NA	<1	
391.2			29							
390.2	Same as above, 20%-30% silt between 31' to 32' bgs, brown 10YR 4/3.		30	P		NR	NA	NA	<1	
389.2			31							
388.2	Same as above, but less than 10% silt and dark yellowish brown 10YR 3/4 from 32' to 33' bgs and yellowish brown 10YR 5/4 from 33' to 35' bgs.		32	Q		NR	NA	NA	7	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson Boring No: SB-208 Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge Surface Elevation: 420.2 Completion Depth: 37.0

Fed. ID No: _____ Auger Depth: _____ Rotary Depth: _____

Quadrangle: NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start: 9/19/00 Finish: 9/19/00

UTM (or State Plane) Coord. N (X): 373996.1 E (Y): 786330.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location: Building I-1-23 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
386.2			34	R		NR	0.5 to 1.0	NA	<1	
385.2	LEAN CLAY (CL), 10%-20% silt, trace gravel, medium plasticity, dark gray 5Y 4/1, wet, medium stiff. (Till)		35							
384.2			36	S		NR	NR	NA	NR	
383.2	End of Boring at 37 feet.		37							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-209 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 373984.3 E.(Y) 786314.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-20% silt, trace fine sand, non-plastic, brown 10YR 5/3, dry, very stiff. (Native)			A		92	3.0 to 3.5	NA	<1	
419.7			1							
418.7	Same as above, but moderately wet, plastic, yellowish brown 10YR 5/6, gray vertical mottling/fractures, some black staining, medium stiff to stiff.		2	B		92	0.5 to 1.25	NA	<1	
417.7			3							
416.7	Same as above.		4	C		58	0.5 to 1.5	NA	<1	
415.7			5							
414.7	Same as above, yellowish brown 10YR 5/6, but light olive brown 2.5Y 5/3 at 6' to 7' bgs, very stiff at 7.5' to 8' bgs.		6	D		58	0.5 to 3.0	NA	<1	
413.7			7							
412.7	Same as above, medium plasticity, moderately wet, medium stiff.		8	E		83	0.5 to 0.75	NA	<1	
411.7			9							
410.7	Same as above, stiff to very stiff, low plasticity, gray mottled areas have higher plasticity due to wetness.		10	F		83	1.5 to 3.0	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-209 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 37.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 373984.3 E (Y) 786314.6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408 7	Same as above, medium plasticity, very stiff, still gray fracture (with slightly lower stiffness).		12	G		100	2 5 to 3 0	NA	1	
407 7			13							
406 7	Same as above.		14	H		100	2.0 to 3.0	NA	3	
405 7			15							
404 7	Same as above, medium stiff to stiff.		16	I		100	0.75 to 1 5	NA	7	
403 7			17							
402 7	Same as above.		18	J		100	0 5 to 1 75	NA	22	
401 7			19							
400 7	SANDY SILT (ML), fine sand, 30%-40% sand, trace clay, yellowish brown 10YR 5/6, wet.		20	K		NR	NA	NA	5	
399 7			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-209 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 373984.3 E.(Y) 786314.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		NR	NA	NA	5	
397.7			23							
396.7	Same as above.		24	M		100	NA	NA	7	
395.7			25							
394.7	Same as above.		26	N		100	NA	NA	9	
393.7			27							
392.7	**POORLY GRADED SAND (SP)**, fine sand, trace silt, light olive brown 2.5Y 5/3.		28	O		46	NA	NA	2	
391.7			29							
390.7	Increasing grain size with depth, medium to coarse sand below 30' bgs.		30	P		46	NA	NA	2	
389.7			31							
388.7	**SILT (ML)**, trace clay, light olive gray 2.5Y 5/3, wet.		32	Q		NR	0.5	NA	2	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-209 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 37.0

Fed. ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 373984.3 E (Y) 786314.6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
386.7	LEAN CLAY (CL), 30%-40% silt, plastic, gray 5Y 5/1, uniform color and texture, wet, medium stiff. (Till)		34	R		NR	0.5 to 1.0	NA	3	
385.7	SILT (ML), same as at 32' to 34' bgs.		35							
384.7	LEAN CLAY (CL), as at 34' to 35' bgs. with 20% sand, trace gravel.		36	S		NR	NR	NA	NR	
383.7	End of Boring at 37 feet.		37							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-210 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 46.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 373926.5 E.(Y) 786351.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H - R. Williams

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, non-plastic, yellowish brown 10YR 5/6, no odor, dry, stiff to very stiff.			A		100	1.5 to 2.5	NA	<1	
420.0			1							
419.0	Same as above, primarily yellowish brown 10YR 5/4, with some gray 2.5Y 6/1, medium plasticity, very stiff.		2	B		100	2.25	NA	<1	
418.0			3							
417.0	Same as above, but 10%-20% silt, grading to olive brown 2.5Y 4/3 between 4' to 5' bgs, grading to grayish brown between 5' to 7' bgs, and yellowish brown 10YR 5/4 below 7' bgs, plastic (all), medium stiff to stiff.		4	C		63	0.5- to 2.0	NA	<1	
416.0			5							
415.0			6	D		63	0.5 to 1.0	NA	<1	
414.0			7							
413.0	Same as above (below 7' bgs), with some grayish brown streaking, trace black staining, moderately wet, stiff.		8	E		100	1.5 to 2.0	NA	<1	
412.0			9							
411.0	Same as above.		10	F		100	1.5 to 2.0	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-210 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 46.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/17/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 373926.5 E (Y) 786351.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H - R. Williams

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
409.0	Same as above, with more black staining and yellowish brown 10YR 5/6, stiff.		12	G		100	2.0	NA	2	
408.0			13							
407.0	Same as above, but with gray vertical fractures, stiff to very stiff.		14	H		100	1.5 to 2.5	NA	4	
406.0			15							
405.0	Same as above, stiff.		16	I		100	1.25 to 2.0	NA	7	
404.0			17							
403.0			18	J		100	0.5	NA	10	
402.0	SILT (ML), 10%-20% fine sand, low plasticity, yellowish brown 10YR 5/8, no odor, wet, medium stiff.		19							Sample J collected in transition.
401.0			20	K		NR	<0.5	NA	2	
400.0	SANDY SILT (ML), varying amounts of sand (ranging from 20%-40%) along interval with clay occuring in pockets up to 20% in isolated locations, all yellowsh brown 10YR 5/6, wet, no odor, loose.		21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-210 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 46.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 373926.5 E.(Y) 786351.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H - R. Williams

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		NR	<0.5	NA	2	
398.0			23							
397.0	**SILTY SAND (SM)**, 30% to 40% silt.		24	M		83	NA	NA	<1	
396.0			25							
395.0			26	N		83	NA	NA	<1	
394.0	**WELL GRADED SAND (SW)**, fine to medium sand, trace silt, yellowish brown 10YR 5/8, no odor, wet, loose.		27							
393.0	**POORLY GRADED SAND (SP)**, fine sand, trace silt, light yellowish brown 10YR 6/4, wet.		28	O		83	NA	NA	<1	
392.0	Same as above, with increasing amounts of gravel between 28.5' to 29.0' bgs (up to 10%). High silt, 10YR 4/3 brown from 29.5' to 29.8' bgs.		29							
391.0	Same as above, 5% to 15% silt below 30' bgs.		30	P		83	NA	NA	<1	
390.0			31							
389.0	Same as above.		32	Q		100	NA	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-210 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 46.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec 32 T. 9 S R 2 E Date Start 9/17/00 Finish 10/2/00

UTM (or State Plane) Coord N.(X) 373926.5 E (Y) 786351.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J Pitsch
H - D. Powney
H - R Williams

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 30%-40% silt, trace gravel, low to medium plasticity, gray 2.5Y 5/1, no odor, moderately wet, stiff (Till)						1.0			
387.0			34	R		100	1.0	NA	<1	
386.0	Decreasing silt with depth, some sand and gravel lenses below 35 feet.		35							
385.0			36	S		100	1.0 to 1.5	NA	<1	End of boring at 36' bgs. on 9/17/00. Boring continued on 10/2/00 at location 2' west from original boring (blind drilled to 36' bgs). Duplicate FDUP32/33-034-001002 collected (at 36' bgs).
384.0	POORLY GRADED SAND WITH SILT (SP-SM), fine sand, 10% silt, light olive brown 2.5Y 5/3, wet, loose. LEAN CLAY (CL), 5%-10% silt, trace gravel, dark gray 5Y 4/1, moist to wet, stiff, increasing silt with depth. (Till)		37							
383.0			38	T		100	1.0 to 1.5	NA	<1	
382.0			39							
381.0	SILT (ML), 5%-10% clay, nonplastic, gray 5Y 5/1, slightly moist, very stiff to hard.		40	U		100	3.0 to 4.0	NA	<1	
380.0	SILTY SAND (SM), as at 36.5' to 37' bgs, but with 20% silt, trace gravel.		41							
379.0	LEAN CLAY (CL), as at 37' to 39.5' bgs, stiff. (Till)		42	V		100	1.0	NA	<1	
378.0	Same as above.		43							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-210 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 46.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 373926.5 E.(Y) 786351.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H - R. Williams

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			W		100	1.0	NA	<1	
376.0			45							
375.0	**End of Boring at 46 feet.**		46							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-211 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.9 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 374110.7 E.(Y) 786279.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, trace gravel, non-plastic, brownish yellow 10YR 6/6, dry, hard, flakey. (Fill)			A		100	NA	NA	<1	Too dry for penetrometer test.
419.9			1							
418.9	Same as above, some gray mottling, no gravel, 10%-20% silt, low to medium plasticity, yellowish brown 10YR 5/4, slightly wet, medium stiff to very stiff.		2	B		100	0.75 to 3.5	NA	<1	
417.9			3							
416.9	Same as above, trace coarse gravel, medium plasticity, medium stiff.		4	C		54	0.75	NA	<1	
415.9			5							
414.9	Same as above.		6	D		54	0.5 to 0.75	NA	<1	
413.9			7							
412.9	**LEAN CLAY (CL),** as above, gray mottling very expansive, some black staining, very stiff. (Native)		8	E		71	2.0 to 3.0	NA	<1	QC sample E/F looks like native soil.
411.9			9							
410.9	Same as above.		10	F		71	2.0 to 2.5	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-211 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.9 Completion Depth 37.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N (X) 374110.7 E (Y) 786279.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408.9	Same as above, very stiff.		12	G		100	2.5 to 3.25	NA	<1	
407.9			13							
406.9	Same as above, but less gray mottling.		14	H		100	2.5 to 3.5	NA	<1	
405.9			15							
404.9	Same as above, stiff.		16	I		100	1.5 to 1.75	NA	<1	
403.9			17							
402.9	Same as above, increasing sand with depth (to 20% at 20' bgs), decreasing stiffness with depth to soft at 20' bgs.		18	J		100	0.5 to 1.5	NA	<1	Duplicate FDUP32/33-020-000920 collected.
401.9			19							
400.9	SANDY SILT (ML), 40%-50% fine sand, 5% to 10% clay, yellowish brown 10YR 5/6, wet, loose to medium dense, some gray mottling.		20	K		100	<0.5	NA	1	
399.9			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-211 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.9 Completion Depth 37.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 374110.7 E.(Y) 786279.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	NA	NA	10	
397.9			23							
396.9	Same as above, less silt (20%-30%), decreasing silt with depth.		24	M		67	NA	NA	5	
395.9			25							
394.9	**POORLY GRADED SAND WITH SILT (SP-SM),** fine sand, 10%-20% silt, brown 10YR 5/3, wet, loose to medium dense.		26	N		67	NA	NA	5	
393.9			27							
392.9	Same as above.		28	O		54	NA	NA	<1	
391.9			29							
390.9	Same as above, but medium to coarse sand with trace coarse gravel between 30' to 31' bgs, color changes to light olive brown 2.5Y 5/3 below 31' bgs.		30	P		54	NA	NA	2	
389.9			31							
388.9	**SILT (ML),** 20%-30% sand, trace clay, gray 2.5Y 5/1, uniform color and texture, wet, soft.		32	Q		100	NA	NA	2	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-211 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.9 Completion Depth 37.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord N (X) 374110.7 E (Y) 786279.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but 10YR 5/3 brown between 33' to 34' bgs.									
386.9			34	R		100	NA	NA	2	
	Color change to 2.5Y 5/1 gray.									
385.9			35							
384.9			36	S		100	NA	NA	NR	
383.9	End of Boring at 37 feet.		37							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-212 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.5 Completion Depth 46.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 374066.0 E.(Y) 786285.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, brown 10YR 5/3, dry, very stiff to hard. (Native)			A		100	3.75 to 4.25	NA	<1	Grass at the surface.
419.5			1							
418.5	Same as above, but 10%-20% silt, low to medium plasticity, yellowish brown 10YR 5/4, dry, stiff.		2	B		100	1.25 to 1.75	NA	<1	
417.5			3							
416.5	Same as above, but medium stiff, plastic, moderately wet, with gray mottling (vertical fractures), and some black staining.		4	C		75	0.75	NA	<1	
415.5			5							
414.5	Same as above.		6	D		75	0.75	NA	<1	
413.5			7							
412.5	Same as above, soft.		8	E		83	<0.5	NA	5	
411.5			9							
410.5	Same as above, stiff.		10	F		83	1.5 to 2.0	NA	200	Duplicate FDUP32/33-017-000920 collected.

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Illinois Environmental Protection Agency — Field Boring Log

Site File No: | County: Williamson | Boring No: SB-212 | Monitor Well No.:

Site File Name: Crab Orchard National Wildlife Refuge | Surface Elevation: 420.5 | Completion Depth: 46.0

Fed ID No: | Auger Depth: | Rotary Depth:

Quadrangle: NW 1/4 of SW 1/4 | Sec: 32 | T: 9 S | R: 2 E | Date Start: 9/20/00 | Finish: 9/20/00

UTM (or State Plane) Coord N (X): 374066.0 | E (Y): 786285 2

Latitude: ° ' " | Longitude: ° ' "

Boring Location: Building I-1-23 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408 5	Same as above, but stiff to very stiff.		12	G		100	2 0 to 2.5	NA	133	
407 5			13							
406 5	Same as above, very stiff, high PID hits correspond to gray fractures.		14	H		100	2 5 to 3.0	NA	167	
405 5			15							
404 5	Same as above, stiff.		16	I		100	1.5 to 2.0	NA	267	
403 5			17							
402 5	Same as above, but medium stiff, increasing sand with depth.		18	J		100	0.5 to 1 0	NA	63	Sample J collected above silty sand (SM).
401 5			19							
400 5	**SILTY SAND (SM)**, fine sand, 30%-40% silt, trace clay, yellowish brown 10YR 5/6, gray mottling, black staining, wet, loose to medium dense.		20	K		83	NA	NA	56	
399 5	**POORLY GRADED SAND WITH SILT (SP-SM)**, fine sand, 10%-20% silt, yellowish brown 10YR 5/6, wet, loose.		21							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-212 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.5 Completion Depth 46.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 374066.0 E.(Y) 786285.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but increasing silt with depth (20%-30% at 23' to 24' bgs).			L		83	NA	NA	28	
397.5			23							
396.5	Same as above, 10%-20% silt.		24	M		83	NA	NA	56	
395.5			25							
394.5	Same as above, medium sand between 26.5' to 28' bgs.		26	N		83	NA	NA	11	
393.5			27							
392.5	**POORLY GRADED SAND (SP)**, as above, but medium sand, trace silt, 2.5Y 5/4 light olive brown.		28	O		75	NA	NA	2	
391.5			29							
390.5	Same as above.		30	P		75	NA	NA	3	
389.5			31							
388.5	Same as above, medium to coarse sand at 33.6' to 34' bgs.		32	Q		96	NA	NA	2	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-212 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.5 Completion Depth 46.0

Fed. ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord N.(X) 374066.0 E (Y) 786285.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
386.5	SILT WITH SAND (ML), 20%-30% silt, 20% sand, low plasticity, brown 10YR 5/3.		34	R		96	NA	NA	1	
385.5	POORLY GRADED SAND (SP), as at 28' to 30' bgs.		35							
384.5	Same as above, but medium sand, light olive brown 2.5Y 5/3.		36	S		92	NA	NA	<1	
383.5			37							
382.5	Same as above, but medium to coarse sand, some 1" silty layers, with black staining interspersed in sand.		38	T		92	NA	NA	<1	
381.5			39							
380.5	Same as above, trace gravel at 40.5' to 41.0' bgs.		40	U		92	NA	NA	<1	
379.5			41							
378.5			42	V		NR	0.5 to 0.75	NA	<1	
377.5	LEAN CLAY (CL), 5%-10% silt, trace gravel, very plastic, uniform color and texture, moderately wet, medium stiff. (Till)		43							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-212 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.5 Completion Depth 46.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 374066.0 E.(Y) 786285.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - J. Pitsch
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			W		NR	0.5 to 0.75	NA	<1	
375.5			45							
374.5	**End of Boring at 46 feet.**		46							

(950226)

2.11

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-213 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 46.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 374101.6 E.(Y) 786260.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-25% silt, trace fine sand, low plasticity, brown 10YR 5/3 with gray mottling, dry, flakey, very stiff. (Fill)			A		100	3.0 to 3.5	NA	<1	Grass at the surface.
419.7			1							
418.7	Same as above, not flakey, very stiff.		2	B		100	2.5 to 3.0	NA	<1	
417.7			3							
416.7	Same as above, but 10%-20% silt, trace fine gravel, low to medium plasticity, some black staining, mostly yellowish brown 10YR 5/4, gray mottling, moist, stiff.		4	C		100	1.5 to 2.0	NA	<1	
415.7			5							
414.7	Same as above, stiff.		6	D		100	1.5 to 1.75	NA	<1	
413.7			7							
412.7	Same as above, medium stiff, wet, no gray mottling, no black staining.		8	E		50	0.5	NA	<1	
411.7			9							
410.7	Same as above.		10	F		50	0.5	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-213 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 46.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord N.(X) 374101.6 E (Y) 786260 4

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408 7	Same as above, soft, trace fine gravel, one brick fragment.		12	G		46	<0 5	NA	<1	
407 7			13							
406 7	Same as above.		14	H		46	<0 5	NA	<1	
405 7			15							
404 7	Same as above, but light olive brown 2.5Y 5/4, very soft, very wet.		16	I		42	<0 2	NA	<1	
403 7			17							
402 7	Same as above.		18	J		42	<0.2	NA	<1	
401 7			19							
400 7	Same as above, increasing stiffness, brown 10YR 5/6 with gray mottling, increasing sand with depth, medium plastic.		20	K		63	0 5	NA	<1	
399 7			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-213 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 46.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 374101.6 E.(Y) 786260.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILTY SAND (SM), fine sand, 30%-40% silt, yellowish brown 10YR 5/6, wet, loose to medium dense, gray mottled area at 22.3' to 22.5' bgs with black staining. (High PID hit in gray area) (Native)			L		63	NA	NA	16	
397.7			23							
396.7	Same as above, but 20%-30% silt and no gray areas.		24	M		67	NA	NA	4	
395.7			25							
394.7	Same as above, but grades to brownish yellow 10YR 6/6.		26	N		67	NA	NA	4	
393.7	40%-50% silt from 27' to 27.7' bgs.		27							
392.7	**POORLY GRADED SAND (SP)**, fine sand, 5%-10% silt, brownish yellow 10YR 6/6, wet, loose.		28	O		83	NA	NA	8	
391.7	Same as above, but fine to medium sand, trace coarse gravel, yellowish brown 10YR 5/6.		29							
390.7	Dark yellowish brown 10YR 4/4 at 30' to 31' bgs, mostly fine sand, trace gravel.		30	P		83	NA	NA	4	
389.7	**WELL GRADED SAND (SW)**, fine to coarse sand, trace silt, trace medium gravel, olive brown 2.5Y 4/4, wet, loose.		31							
388.7	**SILT (ML)**, 10%-20% very fine sand, low plasticity, dark gray 2.5Y 4/1 at 32' to 32.3' bgs, light olive brown 2.5Y 5/4 below 32.3' bgs, medium stiff. (Lacustrine)		32	Q		88	0.5 to 0.75	NA	6	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No: | County: Williamson | Boring No: SB-213 | Monitor Well No:

Site File Name: Crab Orchard National Wildlife Refuge | Surface Elevation: 420.7 | Completion Depth: 46.0

Fed. ID. No: | Auger Depth: | Rotary Depth:

Quadrangle: NW 1/4 of SW 1/4 | Sec: 32 | T: 9 S | R: 2 E | Date: Start 9/26/00 | Finish 9/26/00

UTM (or State Plane) Coord. N (X): 374101.6 | E (Y): 786260.4

Latitude: ° ' " | Longitude: ° ' "

Boring Location: Building I-1-23 Area

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL:
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
386.7	Increasing fine sand with depth to 20%-30%, more transmissive at 33' to 34.5' bgs.		34	R		83	0.75 to 1.0	NA	4	
385.7	Silt as at 32' to 32.3' bgs, dark gray 2.5Y 4/1 below 35' bgs.		35							
384.7	POORLY GRADED SAND (SP), as from 27.7' to 30' bgs. SILT (ML), 20%-30% very fine sand, 10% clay, dark gray 2.5Y 4/1, low plasticity, wet, medium stiff, lenses of silty sand, with 40%-50% sand at 36.5' to 37' bgs.		36	S		100	NA	NA	<1	
383.7			37							
382.7	Same as above, but less sand (10%-20%), moist, medium stiff.		38	T		100	NA	NA	<1	
381.7			39							
380.7	Same as above.		40	U		50	NA	NA	<1	
379.7	WELL GRADED SAND (SW), as at 31' to 32' bgs.		41							
378.7			42	V		NR	NA	NA	<1	
377.7	LEAN CLAY (CL), trace gravel, very plastic, dark gray 5Y 4/1, moist, medium stiff to stiff, uniform color and texture. (Till)		43							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-213 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 46.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 374101.6 E.(Y) 786260.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
375.7			45	W		NR	0.5 to 1.0	NA	<1	
374.7	**End of Boring at 46 feet.**		46							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-214 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 45.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 374123.4 E.(Y) 786246.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
420.0	**LEAN CLAY (CL),** 10%-20% silt, trace fine sand, trace fine gravel, plastic, brownish yellow 10YR 6/6, wet at 0' to 1' bgs (from recent rain), very stiff, flakey. Dry below 1' bgs, non-plastic. (Fill)		1	A		96	2.0 to 3.0	NA	<1	
419.0	Same as above (below 1' bgs), with trace coarse gravel, low to medium plasticity, not flakey, yellowish brown 10YR 5/6 with gray mottling and black staining, stiff. (Fill)		2	B		96	1.5 to 2.0	NA	<1	
418.0			3							
417.0	**LEAN CLAY (CL),** as above, no gravel, moist, low to medium stiff. (Native)		4	C		88	1.25 to 1.5	NA	<1	
416.0			5							
415.0	Same as above.		6	D		88	1.25 to 1.5	NA	<1	
414.0			7							
413.0	Same as above, stiff to very stiff, with gray areas generally being less stiff than yellowish brown areas.		8	E		96	1.5 to 2.5	NA	<1	Duplicate FDUP32/33-021-000926 collected.
412.0			9							
411.0	Same as above, stiff.		10	F		96	1.0 to 2.0	NA	<1	
410.0			11							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-214 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 45.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord N.(X) 374123.4 E (Y) 786246.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, still black staining and gray mottling.			G		100	1.25 to 1.5	NA	<1	
408.0			13							
407.0	Same as above, but stiff to very stiff.		14	H		100	2.0 to 2.5	NA	8	
406.0			15							
405.0	Same as above, but medium stiff to stiff		16	I		100	0.75 to 1.25	NA	<1	
404.0			17							
403.0	Same as above, but very stiff. High PID hits in gray area at 19.7' bgs.		18	J		100	2.25 to 3.25	NA	12	
402.0			19							
401.0	Same as above, but soft to medium stiff		20	K		100	0.5 to 1.0	NA	8	
400.0			21							
399.0	SANDY SILT (ML), 10% sand (increasing with depth to 30%-40%), yellowish brown 10YR 5/6, still evidence of mottling (especially at 22' to 23' bgs), wet, medium dense, decreasing to loose at 24' bgs.		22	L		100	NA	NA	4	
398.0			23							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-214 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 45.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 374123.4 E.(Y) 786246.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but loose, light olive brown 2.5Y 5/4.			M		83	NA	NA	4	
396.0			25							
395.0	Increasing sand with depth, to greater than 50% sand.		26	N		83	NA	NA	4	
394.0	**WELL GRADED SAND WITH SILT (SW-SM),** fine sand, 10%-20% silt, yellowish brown 10YR 6/8, wet, loose to medium dense.		27							
393.0	Same as above, but fine to medium sand, trace gravel, light olive brown 2.5Y 5/6, loose.		28	O		54	NA	NA	2	
392.0			29							
391.0			30	P		54	NA	NA	2	
390.0	Light olive brown 2.5Y 5/3 at 31' to 31.5' bgs.		31							
389.0	**SILTY SAND (SM),** medium to coarse sand, 30%-40% silt, brownish yellow 10YR 6/6.		32	Q		92	0.5	NA	4	
388.0	**SILT WITH SAND (ML),** 10%-20% very fine sand, low plasticity, light olive brown 2.5Y 5/4 grading to olive gray 5Y 5/2 at 34 feet, increasing fine sand with depth. (Lacustrine)		33							
387.0			34	R		92	NA	NA	6	
386.0			35							
	POORLY GRADED SAND WITH SILT (SP-SM), fine to medium sand.									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-214 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.0 Completion Depth 45.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N (X) 374123.4 E (Y) 786246.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT WITH SAND (ML), as at 32' to 34' bgs, but dark gray 5Y 4/1, medium stiff, increasing sand with depth and decreasing stiffness with depth.			S		100	0.5 to 1.0	NA	4	
384.0			37							
	SILTY SAND (SM), very fine sand, 30%-40% silt, dark gray 5Y 4/1, wet, loose to medium density, decreasing silt with depth to 20% at 39' bgs.									
383.0			38	T		100	NA	NA	4	
382.0			39							
	POORLY GRADED SAND (SP), medium sand, dark gray 5Y 4/1, wet, loose.									
381.0	**WELL GRADED SAND (SW)**, medium to very coarse sand, 10% medium gravel, olive gray 5Y 5/2, wet, loose.		40	U		33	NA	NA	<1	
380.0			41							
379.0			42	V		33	0.5 to 1.0	NA	<1	
378.0	**LEAN CLAY (CL)**, trace gravel, very plastic, dark gray 5Y 4/1, wet, medium stiff, uniform color and texture. (Till)		43							
377.0			44	W		100	NR	NA	NR	
376.0	**End of Boring at 45 feet.**		45							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-215 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.4 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 374030.4 E.(Y) 786407.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, trace fine gravel, gray and brown, dry, no odor, very stiff. (Fill)			A		100	2.5	NA	<2	
421.4			1							
420.4	Same as above.		2	B		100	2.5	NA	<2	
419.4			3							
418.4	**LEAN CLAY (CL)**, as above, but more plastic, color to brownish yellow and gray mottling. (Native)		4	C		100	2.5	NA	<2	No gravel noted in QC sample B/C, but texture not quite like native soil. Sample D looks native.
417.4			5							
416.4	Same as above, no odor, little dark brown/black staining.		6	D		100	2.5 to 3.0	NA	<2	
415.4			7							
414.4	Same as above, no odor.		8	E		100	2.0	NA	<2	
413.4			9							
412.4	Same as above, no odor.		10	F		100	2.0	NA	<2	
411.4			11							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson Boring No: SB-215 Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge Surface Elevation: 422.4 Completion Depth: 44.0

Fed. ID. No.: _____ Auger Depth: _____ Rotary Depth: _____

Quadrangle: NW 1/4 of SW 1/4 Sec: 32 T: 9 S R: 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X): 374030.4 E.(Y): 786407.3

Latitude: ___ ° ___ ' ___ " Longitude: ___ ° ___ ' ___ "

Boring Location: Building I-1-23 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, no odor.			G		83	2.5	NA	<2	
409.4			13							
408.4	Same as above, no odor.		14	H		100	2.5 to 3.0	NA	<2	
407.4			15							
406.4	Same as above, no odor, stiff.		16	I		100	1.5	NA	<2	
405.4			17							
404.4	Same as above, no odor.		18	J		100	1.5 to 2.0	NA	<2	
403.4			19							
402.4	Same as above, no odor.		20	K		100	NR	NA	<2	
401.4			21							
400.4	Same as above.		22	L		100	NR	NA	<2	
399.4			23							
	SANDY SILT (ML), brownish yellow 10YR 6/8, moist, no odor.									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-215 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.4 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 374030.4 E.(Y) 786407.3

Latitude ° ' " Longitude ° ' "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, wet, no odor.			M		100	NA	NA	<2	
397.4			25							
396.4	Same as above.		26	N		100	NA	NA	<2	
395.4	**POORLY GRADED SAND (SP)**, fine to medium sand, 5% silt, brownish yellow 10YR 6/8, wet, no odor.		27							
394.4	Same as above, but medium to coarse sand, fine to medium gravel, wet, no odor.		28	O		100	NA	NA	<2	
393.4			29							
392.4	**SILT (ML)**, 40% clay, plastic, gray 10YR 5/1 and brownish yellow mottling, soft, dry.		30	P		100	1.0	NA	<2	
391.4			31							
390.4	**SANDY SILT (ML)**, 30%-40% fine sand, gray 10YR 5/1, wet, no odor.		32	Q		100	NA	NA	<2	
389.4			33							
388.4	Same as above.		34	R		100	NA	NA	<2	
387.4			35							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: | County: Williamson | Boring No: SB-215 | Monitor Well No.:

Site File Name: Crab Orchard National Wildlife Refuge | Surface Elevation: 422.4 | Completion Depth: 44.0

Fed ID No: | Auger Depth: | Rotary Depth:

Quadrangle: NW 1/4 of SW 1/4 | Sec: 32 | T: 9 S | R: 2 E | Date: Start 9/26/00 | Finish 9/26/00

UTM (or State Plane) Coord. N.(X): 374030.4 | E (Y): 786407.3

Latitude: ° ' " | Longitude: ° ' "

Boring Location: Building I-1-23 Area

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, slightly plastic, no odor.			S		100	NA	NA	<2	
385.4			37							
384.4	Same as above, non-plastic.		38	T		100	NA	NA	<2	
383.4			39							
382.4	Same as above, wet, loose.		40	U		100	NA	NA	<2	
381.4			41							
380.4	Coarse sand at 42' to 42.5' bgs.		42	V		100	NR	NA	<2	
379.4	LEAN CLAY (CL), trace gravel, moist, dry, no odor, uniform color and texture. (Till)		43							
378.4	End of Boring at 44 feet.		44							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-216 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.2 Completion Depth 32.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 373945.5 E.(Y) 786419.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, plastic, gray 10YR 5/1, brownish yellow mottling, dry, no odor, very stiff.			A		100	3.5	NA	<2	
420.2			1							
419.2	Same as above.		2	B		100	2.0	NA	<2	
418.2			3							
417.2	Same as above, no odor.		4	C		83	2.5	NA	<2	
416.2			5							
415.2	Same as above, no odor.		6	D		100	2.5	NA	<2	
414.2			7							
413.2	Same as above, no odor, little dark brown/black staining.		8	E		100	2.0 to 2.5	NA	<2	Duplicate FDUP32/33-022-000926 collected.
412.2			9							
411.2	Same as above, no odor.		10	F		100	2.5	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-216 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.2 Completion Depth 32.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 373945.5 E (Y) 786419.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hallemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
409.2	Same as above, no odor.		12	G		100	2.0 to 2.5	NA	<2	
408.2			13							
407.2	Same as above, no odor.		14	H		100	2.5 to 3.0	NA	<2	
406.2			15							
405.2	Same as above, no odor, stiff, no staining.		16	I		100	1.5 to 2.0	NA	<2	
404.2			17							
403.2	Same as above, no odor.		18	J		100	2.0	NA	<2	
402.2			19							
401.2			20	K		100	NA	NA	<2	
	SANDY SILT (ML), slightly plastic, brownish yellow and gray mottling, wet, no odor.									
400.2			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-216 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.2 Completion Depth 32.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/26/00 Finish 9/26/00

UTM (or State Plane) Coord. N.(X) 373945.5 E.(Y) 786419.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	NA	NA	<2	
398.2			23							
397.2	**POORLY GRADED SAND (SP)**, fine grained, brownish yellow 10YR 6/8, wet, no odor.		24	M		50	NA	NA	<2	Chemical odor during QC.
396.2			25							
395.2	Same as above.		26	N		50	NA	NA	<2	
394.2			27							
393.2	Same as above, trace coarse sand, no odor.		28	O		100	NA	NA	<2	
392.2			29							
391.2			30	P		100	1.0	NA	<2	
390.2	**LEAN CLAY (CL)**, trace gravel, plastic, gray 10YR 5/1, dry, stiff, uniform texture and color. (Till)		31							
389.2	**End of Boring at 32 feet.**		32							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-217 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 45.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 374068.8 E.(Y) 786259.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
419.7	**LEAN CLAY (CL),** 20%-30% silt, trace fine sand, low plastic, brownish yellow 10YR 6/6, 10% gray mottling, 5% black staining, dry (wet 0' to 0.8' bgs from recent rainfall), flakey, very stiff to hard.		1	A		100	3.5 to 4.0	NA	<1	Grass at the surface.
418.7	Same as above, but slightly moist, less flakey, less stiff with depth, stiff to very stiff.		2	B		100	1.0 to 3.0	NA	<1	
417.7			3							
416.7	**LEAN CLAY (CL),** as above, 10% gray mottling, <5% black staining, but 10%-20% silt, plastic, moist, medium stiff to stiff. (Native)		4	C		63	0.5 to 1.0	NA	<1	
415.7			5							
414.7	Same as above, stiff.		6	D		63	1.5 to 2.0	NA	<1	
413.7			7							
412.7	Same as above, but 20%-30% silt, low to medium plasticity, 25% gray mottling.		8	E		100	1.75 to 2.0	NA	<1	
411.7			9							
410.7	Same as above.		10	F		100	1.5 to 2.0	NA	<1	
409.7			11							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-217 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 45.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 374068.8 E (Y) 786259.4

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, 10%-20% silt, plastic, 10%-15% gray mottling, medium stiff to stiff.			G		100	0.5 to 1.0	NA	<1	
407.7			13							
406.7	Same as above, but stiff to very stiff.		14	H		100	1.75 to 2.5	NA	<1	
405.7			15							
404.7	Same as above, stiff.		16	I		100	1.0 to 1.25	NA	<1	
403.7			17							
402.7	Same as above.		18	J		100	0.75 to 1.0	NA	<1	
401.7			19							
400.7	SILTY SAND (SM), very fine sand, 30%-40% silt, 10%-20% clay, brownish yellowish 10YR 6/6, wet, medium dense.		20	K		NR	NA	NA	1	
399.7	Same as above, still with gray mottling (increases with depth), clay and silt reducing with depth (<5% and 15%-25% respectively), low to medium dense.		21							
398.7			22	L		NR	NA	NA	3	
397.7			23							
	POORLY GRADED SAND WITH SILT (SP-SM), fine sand, 5%-10% silt.									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-217 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 45.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 374068.8 E.(Y) 786259.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	yellowish brown 10YR 5/6 (light olive brown 2.5Y 5/4 and 10%-15% silt, below 23.6' bgs), wet, loose, medium dense at 23.6' bgs and below.			M		63	NA	NA	1	
395.7	Same as above, but brownish yellow 10YR 6/6, decreasing silt with depth (5%-10% silt at 25.5' bgs), fine to medium sand below 25.5' bgs.		25							
394.7	Same as above, grading to yellowish brown 10YR 5/6 at 27.7' bgs.		26	N		63	NA	NA	1	
393.7			27							
392.7	Same as above, but fine sand, 10%-20% silt, and light olive brown between 28.5' to 29.5' bgs.		28	O		63	NA	NA	<1	
391.7			29							
390.7	Same as above, fine to medium sand, trace silt, and olive yellow 2.5Y 6/6 below 29.5' bgs.		30	P		63	NA	NA	<1	
389.7			31							
388.7	Same as above, but light olive brown 2.5Y 5/4 between 32' to 33' bgs, brownish yellow 10YR 6/6 below 33' bgs.		32	Q		83	NA	NA	<1	
387.7			33							
386.7	Same as above, but 5%-10% black staining below 34' bgs.		34	R		83	NA	NA	<1	
385.7			35							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-217 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.7 Completion Depth 45.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/27/00 Finish 9/27/00

UTM (or State Plane) Coord. N.(X) 374068.8 E (Y) 786259.4

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but medium sand, brownish yellow 10YR 6/6.			S		NR	NA	NA	12	
383.7			37							
382.7	Same as above, but medium to coarse sand.		38	T		NR	NA	NA	141	
	Strong solvent odor and solvent sheen above till (2"), within medium to coarse sand.									
381.7	LEAN CLAY (CL), trace silt, dark gray 5Y 4/1, plastic, moist, stiff. (Till)		39							Sample collected from bottom of sand (PID=141 ppm). Sample collected from top of till (PID=20 ppm).
380.7			40	U		NR	1.0	NA	20	
	WELL GRADED SAND (SW), fine to coarse sand, olive gray 5Y 5/2, wet.									
379.7			41						4	
378.7			42	V		NR	NA	NA	<1	
	LEAN CLAY (CL), as at 39' bgs, with trace gravel, uniform color and texture. (Till)									
377.7			43							
376.7			44	W		NR	NR	NA	NR	
375.7	End of Boring at 45 feet.		45							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-218 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.9 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/4/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 374043.0 E.(Y) 786232.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY WITH SAND (CL), 20%-30% sand, 10%-15% silt, low plasticity, yellowish brown 10YR 5/6, moist, stiff to very stiff. (Fill)			A		100	1.5 to 2.5	NA	<1	Grass at the surface.
419.9			1							
418.9	**LEAN CLAY (CL),** as above, but trace sand, 20%-30% silt, light olive brown, 2.5Y 5/3, dry, very stiff. (Native)		2	B		100	2.5 to 3.0	NA	<1	
417.9			3							
416.9	Same as above, but 40%-50% silt between 4' to 5' bgs, low plasticity, yellowish brown 10YR 5/6 with gray mottling, dry, loose, flakey.		4	C		100	0.75 to 1.25	NA	<1	
415.9	10%-20% silt below 5' bgs, and low to medium plasticity, medium stiff to stiff.		5							
414.9	Same as above, 10%-30% mottling, 5% black staining, stiff to very stiff.		6	D		100	1.25 to 2.25	NA	<1	
413.9			7							
412.9	Same as above, slightly moist.		8	E		100	2.0	NA	<1	
411.9			9							
410.9	Same as above.		10	F		100	1.5 to 2.25	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-218 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.9 Completion Depth 48.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 10/4/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 374043.0 E (Y) 786232.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408.9	Same as above, medium stiff.		12	G		100	1.0 to 1.25	NA	<1	
407.9			13							
406.9	Same as above, very stiff, 5%-10% mottling.		14	H		100	3.0 to 3.5	NA	<1	
405.9			15							
404.9	Same as above, 10%-15% mottling, stiff.		16	I		100	1.75	NA	2	
403.9			17							
402.9	Same as above, stiff.		18	J		100	1.0 to 1.25	NA	2	
401.9			19							
400.9	SANDY LEAN CLAY (CL), as above, but 30%-40% fine sand, no mottling, wet, medium stiff to stiff, no sand between 21' and 22.5' bgs.		20	K		100	0.5 to 1.5	NA	4	Duplicate FDUP32/33-038-001004 collected.
399.9			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-218 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.9 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/4/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 374043.0 E.(Y) 786232.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, 30%-40% fine sand, yellowish brown 10YR 5/4, 20%-30% gray mottling, increasing sand with depth to 40%-50% at 24' bgs, stiff.			L		100	1.0	NA	1	
397.9			23							
396.9	**CLAYEY SAND (SC),** fine sand, 10%-20% silt, 15%-25% clay, dark yellowish brown 10YR 4/6, wet, loose to low dense.		24	M		100	NA	NA	<1	
395.9			25							
394.9	Same as above, but yellowish brown 10YR 5/6.		26	N		100	NA	NA	<1	
393.9			27							
392.9	**POORLY GRADED SAND (SP),** fine sand, <5% silt, dark grayish brown 10YR 4/2, wet, loose to low dense. **SILTY SAND (SM),** fine sand, trace clay, 20%-30% silt, light yellowish brown 2.5Y 6/3, wet, loose.		28	O		96	NA	NA	<1	
391.9			29							
390.9	Same as above, but light olive brown 2.5Y 5/4 below 31' bgs and loose to low dense.		30	P		96	NA	NA	<1	
389.9			31							
388.9	**LEAN CLAY (CL),** 5%-10% silt, plastic to very plastic, dark gray 5Y 4/1, moist, uniform color and texture, soft.		32	Q		100	<0.5	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-218 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.9 Completion Depth 48.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date Start 10/4/00 Finish 10/4/00

UTM (or State Plane) Coord. N (X) 374043.0 E (Y) 786232.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Increasing silt below 33' bgs. to 20%-25% at 35' bgs.									
386.9	LEAN CLAY WITH SAND (CL), as above, but 20%-30% fine sand between 35.5' to 36.0' bgs, stiff.		34	R		100	1.0 to 1.25	NA	<1	
385.9			35							
384.9			36	S		100	NA	NA	<1	
	SANDY SILT (ML), 30%-40% sand, 5%-10% clay, dark gray 5Y 4/1, non-plastic, wet, medium stiff.									
383.9			37							
	SILTY SAND (SM), fine sand, 30%-40% silt, trace clay, dark gray 5Y 4/1, wet, low dense.									
382.9			38	T		100	1.0	NA	<1	
	POORLY GRADED SAND WITH SILT (SP-SM), fine sand, 10% silt, dark gray 2.5Y 4/1, wet, loose.									
381.9			39							
	WELL GRADED SAND (SW), medium to coarse sand, 10% fine gravel, otherwise same as at 38.6' to 39.5' bgs.									
380.9	SANDY SILT (ML), as at 36.2' to 37.5' bgs, stiff.		40	U		50	1.0	NA	<1	Low recovery
	Same as above.									
379.9			41							
378.9	Same as above.		42	V		50	1.0 to 1.25	NA	<1	Low recovery
377.9			43							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-218 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.9 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/4/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 374043.0 E.(Y) 786232.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-23 Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				W		100	0.5 to 0.75	NA	<1	
375.9	**LEAN CLAY (CL),** trace silt, trace gravel, plastic, dark gray 5Y 4/1, moist, medium stiff, uniform color and texture. (Till)		45							
374.9	Same as above, but becoming sandy between 46.5' to 46.8' bgs.		46	X		100	1.0	NA	<1	
373.9			47							
372.9	**End of Boring at 48 feet.**		48							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-300 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.3 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373410.9 E.(Y) 786756.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, brownish yellow 10YR 6/8, no odor, dry, hard, 6" silt at 1' bgs.			A		100	4.5	NA	<2	
419.3			1							
418.3	Same as above, very stiff.		2	B		100	2.5	NA	<2	
417.3			3							
416.3	Same as above, but with gray and brown mottling.		4	C		100	3.0	NA	<2	
415.3			5							
414.3	Same as above, no odor, moist.		6	D		100	3.5	NA	<2	
413.3			7							
412.3	Same as above, moist.		8	E		100	2.5	NA	<2	
411.3			9							
410.3	Same as above.		10	F		100	2.0	NA	<2	
409.3			11							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-300 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.3 Completion Depth 44.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373410.9 E (Y) 786756.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			G		100	<2.0	NA	2.0	
407.3			13							
406.3	Same as above.		14	H		100	<2.0	NA	2.5	
405.3			15							
404.3	Same as above.		16	I		100	1.5	NA	<2	
403.3			17							
402.3	Same as above, but little silt between 19 and 20 feet bgs.		18	J		100	1.5	NA	<2	
401.3			19							
400.3	SILTY SAND (SM), 5-10% clay, yellowish brown 10YR 5/8, no odor, wet.		20	K		100	NA	NA	<2	
399.3			21							
	SANDY CLAY (CL), little silt, yellowish brown 10YR 5/8, no odor, wet.									
398.3			22	L		100	1.0	NA	<2	
397.3			23							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-300 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.3 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373410.9 E.(Y) 786756.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Sandy clay, some silt, no odor, wet, loose.			M		100	NR	NA	<2	
395.3			25							
394.3	Sandy clay, some silt, no odor, wet, loose, 4" sand seam at 27' bgs.		26	N		100	NR	NA	<2	
393.3			27							
392.3	Same as above.		28	O		100	NR	NA	<2	
391.3			29							
390.3	**SANDY SILT (ML)**, brownish yellow 10YR 6/8, no odor, wet, color to gray at 31' bgs.		30	P		100	NA	NA	<2	
389.3			31							
388.3			32	Q		100	NA	NA	<2	
387.3	**SILTY SAND (SM)**, brownish yellow 10YR 6/8, no odor, wet.		33							
386.3			34	R		100	NA	NA	<2	
385.3	**POORLY GRADED SAND (SP)**, 6" sand seam at 35' bgs.		35							
	SILTY SAND (SM), as above, but color to gray 10YR 5/1.									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-300 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.3 Completion Depth 44.0

Fed. ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373410.9 E (Y) 786756.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				S		100	NA	NA	<2	
383.3			37							
382.3	**WELL GRADED SAND (SW)**, fine to medium grained, trace fine gravel, gray 10YR 5/1, no odor, wet, wood chips at 39' bgs.		38	T		100	NA	NA	<2	
381.3			39							
380.3	**LEAN CLAY (CL)**, trace fine gravel, gray 10YR 5/1, uniform color and texture, no odor, dry. (Till)		40	U		100	3.0	NA	<2	
379.3			41							
378.3			42	V		100	NR	NA	<2	
377.3			43							
	POORLY GRADED SAND (SP), 6" sand seam at 43.5' bgs.									
376.3	**End of Boring at 44 feet.**		44							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-301 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.2 Completion Depth 49.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373446.8 E.(Y) 786861.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace gravel low plasticity, yellowish brown 10YR 5/4, dry, flaky, hard. 20%-30% gravel between 2' and 2.2' bgs.			A		92	>4	NA	<1	Grass at the surface.
420.2			1							
419.2			2	B		92	2.5 to 4.5	NA	<1	
	LEAN CLAY (CL), as above, but no gravel, 5% to 10% gray mottling, 5% black staining, very stiff to hard. (Native)									
418.2			3							
417.2	Same as above, but 10%-20% silt, low to medium plasticity, yellowish brown 10YR 5/6, slightly moist, stiff, trace black staining.		4	C		100	1.0 to 1.5	NA	<1	
416.2			5							
415.2	Same as above, very stiff.		6	D		100	2.0 to 2.5	NA	<1	
414.2			7							
413.2	Same as above, very stiff to hard, 30-40% mottled, some up to 70% mottled.		8	E		100	2.5 to 4.0	NA	<1	
412.2			9							
411.2	Same as above, stiff to very stiff.		10	F		100	1.5 to 2.25	NA	<1	

(950226)

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-302 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.7 Completion Depth 49.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373506.5 E.(Y) 786827.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-20% silt, trace fine sand, plastic, brown 10YR 5/3, wet, medium stiff, some black staining. (Fill)			A		83	0.5 to 0.75	NA	<1	Grass at the surface.
424.7			1							
423.7	Same as above, granular charcoal and trace to 20% medium gravel between 3.5' to 4.0' bgs, charcoal ends at 4.5' bgs, but gravel continues to 5' bgs, soft.		2	B		83	0.25 to 0.5	NA	<1	
422.7			3							
421.7	Same as above, but olive gray 5Y 5/2 below 5.0' and 5.5' bgs, no gravel.		4	C		100	0.25 to 0.5	NA	<1	
420.7			5							
419.7	Same as above, but yellowish brown 10YR 5/6, with 10%-20% mottling and 5% black staining, stiffness increases to very stiff at 7' to 8' bgs.		6	D		100	0.5 to 2.25	NA	<1	
418.7			7							
417.7	Same as above, but 20%-30% mottling, medium stiff to stiff, moist to wet, less stiff in mottled areas.		8	E		96	0.5 to 1.5	NA	<1	
416.7			9							
415.7	Same as above, stiff between 11' to 12' bgs.		10	F		96	0.5 to 2.0	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-302 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.7 Completion Depth 49.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373506.5 E (Y) 786827.4

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
413.7	Same as above, trace sand, increasing with depth.		12	G		96	0.5 to 1.25	NA	<1	
412.7			13							
411.7			14	H		96	1.5	NA	<1	
	POORLY GRADED SAND WITH SILT (SP-SM), 10%-15% silt, 10%-15% clay, yellowish brown 10YR 5/4, wet, loose to medium density. **LEAN CLAY (CL)**, same as 10' to 11' bgs, but stiff, 10%-15% mottled, moist, stiff.									
410.7			15							
409.7	Same as above.		16	I		79	1.0 to 1.5	NA	<1	
408.7			17							
407.7	Same as above, with trace gravel between 18' to 20' bgs, 10% mottling.		18	J		79	1.0	NA	<1	
406.7			19							
405.7	Same as above, trace gravel in isolated sections, medium stiff.		20	K		100	0.75	NA	<1	
404.7			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-302 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.7 Completion Depth 49.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373506.5 E.(Y) 786827.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, medium stiff to stiff.			L		100	0.75 to 1.75	NA	<1	
402.7			23							
401.7	Same as above, no mottling, stiff to very stiff.		24	M		100	1.5 to 2.5	NA	<1	
400.7			25							
399.7	Same as above, but 20%-30% silt and 5%-10% very fine sand below 27' bgs, moist to wet, 20% mottling.		26	N		100	1.5 to 2.5	NA	<1	
398.7			27							
397.7	**SILTY SAND (SM),** 20%-30% silt, 5%-10% clay, yellowish brown 10YR 5/6, wet, soft, 10%-15% gray mottling, trace black staining.		28	O		100	NA	NA	<1	
396.7			29							
395.7	Same as above, but 15% silt, trace clay.		30	P		100	NA	NA	<1	
394.7			31							
393.7	**SILTY SAND (SM),** fine sand, 15%-20% silt, brown 10YR 5/3, wet, loose to low density.		32	Q		100	NA	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-302 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.7 Completion Depth 49.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373506.5 E.(Y) 786827.4

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL: G - T. Silverman; D - D. Powney; H - R. Williams; H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
391.7	Same as above.		34	R		100	NA	NA	<1	
390.7			35							
389.7	Same as above.		36	S		100	NA	NA	<1	
388.7	**SILTY SAND (SM)**, 20%-30% silt, dark gray, 5Y 4/1, wet, loose to medium density, increasing clay with depth to 5%-10% between 39' to 40' bgs.		37							
387.7			38	T		100	NA	NA	<1	No syringes collected, since PID is <1 and are low on syringes.
386.7			39							
385.7	**SANDY SILT (ML)**, as above, but 30%-40% sand.		40	U		100	NA	NA	<1	
384.7			41							
383.7	Same as above.		42	V		100	NA	NA	<1	
382.7			43							
	POORLY GRADED SAND WITH SILT (SP-SM), 10% silt, gray 5Y 5/1, wet, low									

(9502226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-302 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 425.7 Completion Depth 49.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373506.5 E.(Y) 786827.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	density.			W		100	NA	NA	<1	
380.7			45							
	Trace silt between 45.5' to 46.5' bgs.									
379.7			46	X		100	1.5	NA	<1	
	LEAN CLAY (CL), trace gravel, plastic, dark gray 5Y 4/1, moist, stiff. (Till)									
378.7			47							
377.7			48	Y		NR	NR	NA	NR	
376.7	**End of Boring at 49 feet.**		49							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-303 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.3 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373550.0 E.(Y) 786799.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, low plasticity, yellowish brown 10YR 5/4, moist 0' to 1' bgs, dry and flaky 1' to 2' bgs, medium stiff to stiff.			A		100	0.75 to 1.25	NA	<1	Grass at the surface.
419.3			1							
418.3	Same as above, but slighty moist, plastic, stiff.		2	B		100	1.0 to 1.25	NA	<1	
417.3			3							
416.3	Same as above, but 10%-20% silt, medium stiff to stiff.		4	C		100	0.5 to 1.5	NA	<1	
415.3			5							
414.3	Same as above, but stiff, with 20%-30% gray mottling and 5% black staining, low to medium plasticity, stiff to very stiff, lower stiffness in mottled areas.		6	D		100	1.5 to 2.5	NA	<1	
413.3			7							
412.3	Same as above, but light olive brown 2.5Y 5/6, with 40%-50% gray mottling, strong solvent odor, moist.		8	E		100	2.0 to 2.5	NA	27	Solvent odor during QC.
411.3			9							
410.3	Same as above.		10	F		100	1.5 to 2.0	NA	29	
409.3			11							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-303 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.3 Completion Depth 44.0

Fed. ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373550.0 E.(Y) 786799.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but yellowish brown 10YR 5/6, with 30%-40% gray mottling. 5% black staining, no solvent odor, stiff.			G		100	1.25	NA	<1	
407 3			13							
406 3	Same as above.		14	H		100	1.0 to 1 5	NA	<1	
405 3			15							
404 3	Same as above, but 10%-15% mottled and 5%-10% black staining.		16	I		100	1.5	NA	<1	
403 3			17							
402 3	Same as above, but 2%-5% black stains.		18	J		100	1 0 to 1.5	NA	<1	
401 3			19							
400 3	Same as above, medium stiff to stiff.		20	K		100	0 75 to 1 25	NA	<1	
399 3			21							
398 3	Same as above, becoming more stiff with depth, increasing fine sand 23' to 24' bgs to 20% at 24' bgs.		22	L		100	0 75 to 2.0	NA	<1	
397 3			23							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-303 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.3 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373550.0 E.(Y) 786799.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILTY SAND (SM), 30%-40% silt, light olive brown 2.5Y 5/4, wet, medium dense.			M		100	NA	NA	<1	
395.3	**POORLY GRADED SAND WITH SILT (SP-SM),** 10% silt, light olive brown 2.5Y 5/4, wet, loose.		25							
394.3	**POORLY GRADED SAND (SP),** trace silt, 10YR 5/8 yellowish brown between 27' and 27.7' bgs.		26	N		100	NA	NA	<1	
393.3			27							
392.3	**WELL GRADED SAND (SW),** fine to coarse sand, trace silt, light olive brown 2.5Y 5/6, wet, loose.		28	O		100	NA	NA	3	PID hit in sand (SW).
391.3	**POORLY GRADED SAND (SP),** fine to medium sand, 10% medium to coarse gravel, 5%-10% silt, light olive brown 2.5Y 5/4, wet, loose.		29							
390.3			30	P		100	NA	NA	<1	
389.3	**WELL GRADED SAND (SW),** fine to medium sand, trace gravel, 5% silt, light olive brown 2.5Y 5/4, wet, loose.		31							
388.3	**LEAN CLAY (CL),** trace gravel, plastic, dark gray 5Y 4/1, uniform color and texture, moist, stiff. (Till)		32	Q		100	1.0 to 1.5	NA	<1	
387.3			33							
386.3	Same as above.		34	R		100	1.0 to 1.25	NA	<1	
385.3			35							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-303 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.3 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373550.0 E (Y) 786799.1

Latitude ___ ___ ___ Longitude ___ ___ ___

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but soft to medium stiff.			S		75	0.25 to 0.75	NA	<1	
383.3			37							
382.3	Same as above.		38	T		75	0.25 to 0.75	NA	<1	
381.3			39							
380.3	Same as above, medium stiff.		40	U		100	0.5 to 1.0	NA	<1	
379.3			41							
378.3	Same as above.		42	V		100	0.5 to 1.0	NA	<1	
377.3			43							
376.3	End of Boring at 44 feet.		44							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-304 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.2 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373493.0 E.(Y) 786726.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, plastic, yellowish brown and gray mottling, dry, no odor.			A		100	3.5	NA	<2	
420.2			1							
419.2	Same as above.		2	B		100	1.75	NA	<2	
418.2			3							
417.2	Same as above.		4	C		100	1.5	NA	<2	
416.2			5							
415.2	Same as above, but color to gray at 6' bgs.		6	D		100	1.5	NA	<2	
414.2			7							
413.2	Same as above.		8	E		100	3.5	NA	<2	
412.2			9							
411.2	Same as above.		10	F		100	2.5	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-304 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.2 Completion Depth 48.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373493.0 E (Y) 786726.5

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 68DT Track

PERSONNEL
G - R. Hallemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
409.2	Same as above, dry, no odor, less mottling.		12	G		100	1.0	NA	<2	
408.2			13							
407.2	Same as above, dry, no odor.		14	H		100	1.5	NA	<2	
406.2			15							
405.2	Same as above, moist, no odor.		16	I		100	0.5	NA	<2	
404.2			17							
403.2	Same as above, little silt at 19.5' to 19.8' bgs.		18	J		100	1.0	NA	<2	
402.2			19							
401.2	Same as above, little sand at 21' to 22' bgs.		20	K		100	0.5	NA	NR	
400.2			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-304 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.2 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373493.0 E.(Y) 786726.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, little silt at 23' to 23.5' bgs.			L		100	0.5	NA	NR	
398.2			23							
397.2	Same as above.		24	M		100	0.5	NA	<2	
396.2			25							
395.2	Same as above, little silt and sand at 27' to 28' bgs.		26	N		100	1.5	NA	<2	
394.2			27							
393.2	**SANDY SILT (ML)**, yellowish brown 10YR 5/8, wet, no odor.		28	O		100	NA	NA	<2	
392.2	2" sand seam at 29' bgs.		29							
391.2			30	P		100	NA	NA	<2	
390.2	Color to gray at 31' to 31.5' bgs. 2" sand seam at 31.5' bgs.		31							
389.2			32	Q		100	NA	NA	<2	
	Same as above, increasing sand content, 1" sand seam at 32.5' bgs.									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-304 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.2 Completion Depth 48.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373493.0 E (Y) 786726.5

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
387.2	Same as above. 4" sand seam at 34'.		34	R		100	NA	NA	<2	
386.2			35							
385.2	Same as above, wet, no odor, color to gray 10YR 5/1.		36	S		100	NA	NA	<2	
384.2			37							
383.2	**SILTY SAND (SM)**, gray 10YR 5/1, wet, no odor.		38	T		100	NA	NA	<2	
382.2	**SANDY SILT (ML)**, gray 10YR 5/1, wet, no odor.		39							
381.2			40	U		100	NA	NA	<2	
380.2			41							
379.2	**WELL GRADED SAND (SW)**, trace medium gravel, gray 10YR 5/1, wet, no odor.		42	V		100	NA	NA	<2	
378.2	Some silt from 43' to 43.8' bgs.		43							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-304 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 421.2 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/30/00 Finish 9/30/00

UTM (or State Plane) Coord. N.(X) 373493.0 E.(Y) 786726.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SANDY SILT (ML)			W		100	<2	NA	1.5	
	LEAN CLAY (CL), trace gravel, gray 10YR 5/1, uniform color and texture, moist, no odor. (Till)									
376.2			45							
375.2	Same as above.		46	X		100	<2	NA	3.5	
374.2			47							
373.2	**End of Boring at 48 feet.**		48							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-305 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.6 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373338.8 E.(Y) 786897.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-20% silt, trace fine sand, plastic, light olive brown 2.5Y 5/4, moist, stiff to very stiff.			A		100	1.0 to 2.5	NA	<1	
414.6			1							
413.6	Same as above, but low plasticity, slightly moist, primarily yellowish brown 10YR 5/4, with gray mottling, stiff.		2	B		100	1.0 to 2.0	NA	<1	
412.6			3							
411.6	Same as above, but light olive brown 2.5Y 5/3 at 4' to 5' bgs, with trace gravel, stiff, wet.		4	C		83	1.0 to 2.75	NA	<1	
410.6	Below 5' bgs, yellowish brown 10YR 5/6, 20%-30% mottling, 5%-10% black staining, very stiff.		5							
409.6			6	D		83	1.5 to 2.0	NA	<1	
408.6			7							
	SILTY SAND (SM), very fine sand, 30% silt, yellowish brown 10YR 5/8, moist, medium density.									
407.6	**LEAN CLAY (CL),** 10% to 20% silt, trace fine sand, plastic, yellowish brown 10YR 5/1, with 10%-15% gray mottling and 5% black stains, slightly moist, stiff.		8	E		100	1.0 to 1.5	NA	<1	
406.6			9							
405.6	Same as above, stiff to very stiff.		10	F		100	1.25 to 2.75	NA	<1	
404.6			11							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-305 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.6 Completion Depth 44.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N (X) 373338.8 E (Y) 786897 1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above. 15% to 25% silt, mottled areas softer that non-mottled areas.			G		100	1.5 to 2.5	NA	<1	
402.6			13							
401.6	Same as above, stiff.		14	H		100	1.0 to 2.0	NA	<1	
400.6			15							
399.6	Same as above, medium stiff.		16	I		100	0.5 to 1.0	NA	<1	
398.6			17							
397.6	Same as above, soft to medium stiff, very plastic, moist to wet, 30%-40% mottled.		18	J		100	0.25 to 1.0	NA	<1	
396.6			19							
395.6	Same as above, decreasing mottling with depth to 5% below 21' bgs, color grades to light olive brown 2.5Y 5/4 below 22' bgs.		20	K		100	0.25 to 0.75	NA	<1	
394.6			21							
393.6	Same as above, light olive brown 2.5Y 5/4.		22	L		100	0.75 to 1.0	NA	<1	
392.6			23							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-305 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.6 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373338.8 E.(Y) 786897.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but with trace fine sand and trace medium gravel, sand increases with depth, soft.			M		100	<0.5	NA	<1	
390.6			25							
389.6	**SILTY SAND (SM),** fine sand, 30%-40% silt, 5%-10% clay, light olive brown 2.5Y 5/4, wet, loose.		26	N		100	<0.5	NA	<1	
388.6	Same as above, but 1/2 light olive brown 2.5Y 5/4, 1/2 yellowish brown 10YR 5/6, 15%-20% silt.		27							
387.6			28	O		100	<0.5	NA	<1	
386.6	**SANDY SILT (ML),** 30%-40% very fine sand, trace clay, dark gray 5Y 4/1, wet, soft.		29							
385.6	Same as above, but 10%-15% sand, increasing clay with depth to 10% at 32' bgs.		30	P		100	0.5 to 1.0	NA	<1	
384.6			31							
383.6	**LEAN CLAY (CL),** no gravel, very plastic, dark gray 5Y 4/1, wet, soft. (Till)		32	Q		100	NR	NA	<1	
382.6	**POORLY GRADED SAND WITH SILT (SP-SM),** 10% silt, trace clay, dark gray 5Y 4/1, wet, loose.		33							
381.6			34	R		100	NA	NA	<1	
380.6	**POORLY GRADED SAND (SP),** fine to medium sand, trace silt, dark gray 2.5Y 4/1, wet, loose.		35							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-305 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.6 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R 2 E Date Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373338.8 E.(Y) 786897.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	WELL GRADED SAND (SW), fine to coarse, dark gray 2.5Y 4/1, wet, loose.			S		100	NA	NA	<1	
378.6			37							
377.6	**LEAN CLAY (CL)**, as at 32' to 33' bgs, but with trace gravel, uniform color and texture, soft to medium stiff. (Till)		38	T		100	0.25 to 0.75	NA	<1	
376.6			39							
375.6	Same as above, wood fragment with dark staining around it.		40	U		100	0.75 to 1.0	NA	<1	
374.6			41							
373.6	Same as above.		42	V		100	0.75 to 1.0	NA	<1	
372.6			43							
371.6	**End of Boring at 44 feet.**		44							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-306 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.3 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/16/00 Finish 10/16/00

UTM (or State Plane) Coord. N.(X) 373426.6 E.(Y) 786670.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
421.3	**LEAN CLAY (CL),** 10%-30% silt, trace fine sand, mottled light yellowish brown 2.5Y 6/3 and brownish yellow 10YR 6/6, plastic to nonplastic, no odor, moist, very stiff. (Loess)		1	A		100	2.5 to 3.7	NA	<2	Grass at the surface.
420.3	Same as above, stiff to very stiff.		2	B		100	1.7 to 2.6	NA	<2	
419.3			3							
418.3	Same as above, very stiff.		4	C		100	2.1 to 2.6	NA	<2	
417.3			5							
416.3	Same as above, very stiff to hard.		6	D		100	2.3 to 4.4	NA	<2	
415.3			7							
414.3	Same as above, medium stiff to very stiff.		8	E		96	0.8 to 2.4	NA	<2	
413.3			9							
412.3	Same as above, stiff to very stiff.		10	F		92	1.8 to 3.6	NA	<2	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-306 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.3 Completion Depth 48.0

Fed. ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 10/16/00 Finish 10/16/00

UTM (or State Plane) Coord. N.(X) 373426.6 E.(Y) 786670.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
410.3	Same as above.		12	G		100	1.6 to 2.7	NA	<2	
409.3			13							
408.3	Same as above.		14	H		100	1.2 to 2.8	NA	<2	
407.3			15							
406.3	Same as above, medium stiff to stiff.		16	I		96	0.7 to 1.6	NA	<2	
405.3			17							
404.3	Same as above.		18	J		92	0.8 to 1.6	NA	<2	
403.3			19							
402.3	Same as above.		20	K		100	0.5 to 1.2	NA	<2	
401.3			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-306 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.3 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/16/00 Finish 10/16/00

UTM (or State Plane) Coord. N.(X) 373426.6 E.(Y) 786670.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	0.5 to 1.7	NA	<2	
399.3			23							
398.3	**SILT (ML)**,10% to 15% fine sand, slightly plastic, becomes more uniform with depth, less to no mottling, brownish yellow 10YR 6/6, wet, softer.		24	M		100	0.4 to 1.6	NA	<2	
397.3			25							Possibly lacustrine, no apparent structure/laminae.
396.3	Same as above, very soft to medium stiff.		26	N		100	<0.2 to 0.7	NA	<2	
395.3			27							
394.3	Same as above.		28	O		100	<0.2 to 0.3	NA	<2	
393.3			29							
392.3	Same as above, becomes more sandy with depth.		30	P		100	<0.2 to 0.4	NA	<2	
391.3			31							
390.3	**SILTY SAND (SM)**, fine sand, non-plastic, brownish yellow 10YR 6/6, no odor, wet. Varying amounts of fine sand and silt, 20%-80% silt, 20%-50% sand, wet, very soft.		32	Q		100	<0.2	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-306 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.3 Completion Depth 48.0

Fed. ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 10/16/00 Finish 10/16/00

UTM (or State Plane) Coord. N (X) 373426.6 E (Y) 786670.5

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
388.3	Same as above.		34	R		100	<0.2	NA	<2	
387.3			35							
386.3	Same as above, 6" fine to medium sand and 10% silt seam at 36.0' to 36.5' bgs. very soft to stiff. (Lacustrine)		36	S		100	0.2 to 1.6	NA	<2	
385.3			37							
384.3	Same as above, medium stiff to stiff, occasional centimeter thick medium sand seams, gray.		38	T		100	0.6 to 1.6	NA	<2	
383.3			39							
382.3	Same as above, coarsening downward.		40	U		50	0.4	NA	<2	
381.3			41							
380.3	**POORLY GRADED SAND (SP)**, medium sand, 5%-10% silt, non-plastic, gray 2.5Y 5/1, no odor, wet, loose.		42	V		46	0.5	NA	<2	
379.3			43							
	WELL GRADED GRAVEL (GW), 30% fine to coarse sand, 10%-20% silt, gray 2.5Y 5/1, loose.									

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-306 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 422.3 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NW 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/16/00 Finish 10/16/00

UTM (or State Plane) Coord. N.(X) 373426.6 E.(Y) 786670.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				W		100	0.4 to 1.1	NA	<2	
377.3	**LEAN CLAY (CL)**, 5% fine to coarse sand, occasional pebbles, plastic, gray 2.5Y 5/1, no odor, wet, soft to stiff. (Till)		45							Duplicate FDUP32/33-039-001016 collected.
376.3			46	X		100	0.4 to 1.3	NA	<2	
375.3			47							
374.3	**End of Boring at 48 feet.**		48							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-307 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.8 Completion Depth 40.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373419.6 E.(Y) 786994.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, roots, slightly plastic, brown and gray mottling, dry, no odor.			A		100	1.0	NA	<2	
412.8			1							
411.8	Same as above.		2	B		100	0.5	NA	<2	
410.8			3							
409.8	Same as above, dry, no odor, brown spots.		4	C		100	1.0	NA	<2	
408.8			5							
407.8	Same as above, but more plastic.		6	D		100	1.5	NA	<2	
406.8			7							
405.8	Same as above.		8	E		100	3.0	NA	<2	
404.8			9							
403.8	Same as above.		10	F		100	1.5	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-307 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.8 Completion Depth 40.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373419.6 E.(Y) 786994.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
401.8	Same as above, moist, no odor.		12	G		100	2.5	NA	<2	
400.8			13							
399.8	Same as above, moist, no odor.		14	H		100	1.0	NA	<2	
398.8			15							
397.8	Same as above, moist, no odor.		16	I		100	1.0	NA	<2	
396.8			17							
395.8	Same as above, moist, no odor, some silt at 18' to 18.4' bgs.		18	J		100	1.0	NA	<2	
394.8			19							
393.8	**SILTY SAND (SM)**, trace clay, yellowish brown 10YR 6/8, wet, no odor, very soft.		20	K		100	NA	NA	<2	
392.8			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-307 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.8 Completion Depth 40.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373419.6 E.(Y) 786994.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	NA	NA	<2	
390.8			23							
389.8	Same as above, wet, no odor.		24	M		100	NA	NA	<2	
388.8			25							
387.8			26	N		100	NA	NA	<2	
386.8	**SANDY SILT (ML)**, gray 10YR 5/1, wet, no odor.		27							
385.8	**SILTY SAND (SM)**, trace clay, gray 10YR 5/1, wet, no odor.		28	O		100	NA	NA	<2	
384.8			29							
383.8	Same as above.		30	P		100	NA	NA	<2	
382.8			31							
381.8	Same as above, wet, no odor.		32	Q		100	NA	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-307 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.8 Completion Depth 40.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373419.6 E (Y) 786994.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL: G - R. Hafemeister; D - G. Swift; H - R. Hoin; H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
379.8			34	R		100	3.0	NA	<2	
378.8	LEAN CLAY (CL), trace gravel, gray 10YR 5/1, moist, no odor. (Till)		35							
377.8	Same as above, dry, no odor.		36	S		100	3.0	NA	<2	
376.8			37							
375.8	Same as above, dry, no odor.		38	T		100	3.0	NA	<2	
374.8			39							
373.8	End of Boring at 40 feet.		40							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-308 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.3 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373469.4 E.(Y) 787022.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20% to 30% silt, trace fine sand, plastic, brown and gray mottling, gray 10YR 5/1, moist, no odor.			A		100	1.0	NA	<2	
412.3			1							
411.3	Same as above, moist, no odor.		2	B		100	1.5	NA	<2	
410.3			3							
409.3	Same as above, becoming more brown, moist, no odor.		4	C		100	2.0	NA	<2	
408.3			5							
407.3	Same as above, moist, no odor.		6	D		100	1.5	NA	<2	
406.3			7							
405.3	Same as above, moist, no odor.		8	E		100	2.0	NA	<2	
404.3			9							
403.3	Same as above, moist, no odor.		10	F		100	3.5	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-308 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.3 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373469.4 E (Y) 787022.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
401.3	Same as above, little black staining, moist, no odor.		12	G		100	2.0	NA	<2	
400.3			13							
399.3	Same as above, moist, no odor.		14	H		100	2.0	NA	<2	
398.3			15							
397.3	Same as above.		16	I		100	2.0	NA	<2	
396.3			17							
395.3			18	J		100	NR	NA	<2	Duplicate FDUP32/33-030-001001 collected.
394.3	SILTY SAND (SM), gray 10YR 5/1, wet, no odor.		19							
393.3	Same as above, wet, no odor.		20	K		100	NA	NA	<2	
392.3			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-308 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.3 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373469.4 E.(Y) 787022.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A Area

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, wet, no odor.			L		100	NA	NA	<2	
390.3			23							
389.3	Same as above, loose, wet, no odor.		24	M		100	NA	NA	<2	
388.3			25							
387.3	Same as above, loose, wet, no odor.		26	N		100	NA	NA	<2	
386.3			27							
385.3	Same as above.		28	O		100	NA	NA	<2	
384.3			29							
383.3			30	P		100	NA	NA	<2	
382.3			31							
381.3	**LEAN CLAY (CL)**, 10% to 20% silt, trace fine sand, trace gravel, plastic, gray 10YR 5/1, moist, no odor. (Till)		32	Q		100	3.0	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No		County: Williamson	Boring No: SB-308
Site File Name	Crab Orchard National Wildlife Refuge	Surface Elevation	413.3
Fed ID No		Auger Depth	
Quadrangle	NE 1/4 of SW 1/4	Sec. 32 T 9 S R 2 E	Date: Start 10/1/00
UTM (or State Plane) Coord. N.(X)	373469.4	E (Y) 787022.9	
Latitude	° ' "	Longitude	° ' "
Boring Location	Building I-1-36A Area		
Drilling Equipment	Geoprobe 66DT Track		

Monitor Well No:
Completion Depth: 36.0
Rotary Depth:
Finish: 10/1/00

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
379.3	Same as above, moist, no odor.		34	R		100	3.0	NA	<2	
378.3			35							
377.3	End of Boring at 36 feet.		36							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-400 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.0 Completion Depth 32.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374340.3 E.(Y) 786828.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% sand, 5%-10% clay, non-plastic, brownish yellow 10YR 6/6, no odor, moist to dry, cobbles. (Fill)			A		71	1.8	NA	<1	Grass at the surface.
414.0			1							
413.0	**LEAN CLAY (CL)**, 5%-30% silt, trace sand, plastic to non-plastic, yellowish brown 10YR 5/6, no odor, moist, very stiff.		2	B		67	2.8 to 3.3	NA	<1	
412.0			3							
411.0	Same as above.		4	C		100	2.2 to 2.7	NA	<1	
410.0			5							
409.0	Same as above.		6	D		100	2.2 to 3.0	NA	<1	
408.0			7							
407.0	Same as above, but mottled brownish yellow 10YR 6/6 and gray 2.5Y 6/1, very stiff to hard. (Loess)		8	E		100	2.5 to 4.2	NA	<1	
406.0			9							
405.0	Same as above, very stiff.		10	F		100	2.4 to 3.0	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-400 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.0 Completion Depth 32.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374340.3 E (Y) 786828.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
403.0	Same as above.		12	G		100	0.2 to 2.0	NA	<1	
402.0			13							
401.0	LEAN CLAY (CL), 5%-10% silt, plastic, brownish yellow 10YR 6/6 and light yellowish brown 10YR 6/4, no odor, moist, some laminae present, very soft to stiff. (Lacustrine) Same as above, soft to medium stiff.		14	H		100	0.3 to 1.2	NA	<1	
400.0			15							
399.0	Same as above, color is more uniform, some laminae and possible varves are present, very stiff.		16	I		100	2.0 to 3.6	NA	<1	
398.0			17							
397.0	Same as above, medium stiff to stiff.		18	J		100	0.5 to 2.0	NA	<1	
396.0	Zone of silty sand, fine to medium sand, at 19.5' to 19.6' bgs.		19							
395.0	Same as above, very soft to stiff, some laminae contain fine sand.		20	K		100	0.2 to 1.0	NA	<1	
394.0			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-400 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.0 Completion Depth 32.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374340.3 E.(Y) 786828.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, medium stiff to stiff.			L		100	0.5 to 1.6	NA	<1	
392.0			23							
391.0	Same as above, stiff. (Lacustrine)		24	M		100	1.3 to 1.8	NA	<1	
390.0			25							
389.0	Same as above.		26	N		100	1.5 to 1.6	NA	<1	
388.0			27							
387.0			28	O		100	0.8 to 1.8	NA	<1	
386.0	**LEAN CLAY (CL),** 10% silt, trace fine to coarse sand, occasional pebbles, plastic, gray 10YR 5/1, no odor, wet, medium stiff to stiff. (Till)		29							
385.0	Same as above, medium stiff.		30	P		100	0.5	NA	<1	
384.0			31							
383.0	**End of Boring at 32 feet.**		32							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-401 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.6 Completion Depth 32.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374281.8 E.(Y) 786880.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% silt, 5%-10% fine to medium sand, non-plastic, brownish yellow 10YR 6/6, no odor, dry, hard. (Fill)			A		100	4.5	NA	<1	Grass at the surface.
414.6	**LEAN CLAY (CL)**, 5%-30% silt, trace fine sand, plastic to non-plastic, yellowish brown 10YR 5/6 and pale brown 10YR 6/3, and black, no odor, moist, stiff to very stiff.		1							
413.6			2	B		100	1.5 to 2.8	NA	<1	
412.6			3							
411.6	Same as above, stiff to very stiff.		4	C		100	1.8 to 2.2	NA	<1	Duplicate FDUP32/33-015-000919 collected.
410.6	Mottling begins at 5.5' bgs, brownish yellow 10YR 6/6 and gray 2.5Y 6/1. (Loess)		5							
409.6	Same as above, mottled, soft to very stiff.		6	D		100	0.2 to 2.8	NA	<1	
408.6			7							
407.6	Same as above, very stiff.		8	E		100	2.5 to 3.0	NA	<1	
406.6			9							
405.6	Same as above, medium stiff to very stiff.		10	F		100	0.7 to 2.3	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-401 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.6 Completion Depth 32.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N (X) 374281.8 E (Y) 786880.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
403.6	Same as above.		12	G		88	0.2 to 0.5	NA	<1	
402.6			13							
401.6	SILT (ML), 10% fine sand, non-plastic, brownish yellow 10YR 6/8, no odor, wet.		14	H		96	0.3 to 1.0	NA	<1	
400.6	LEAN CLAY (CL), plastic, brownish yellow 10YR 6/8 and pale brown 10YR 6/3, no odor, wet.		15							
399.6	Same as above, very soft to medium stiff.		16	I		100	0.2 to 1.0	NA	<1	
398.6	Laminae begin at 17.5' bgs. (Lacustrine)		17							
397.6	Same as above, very soft to medium stiff.		18	J		100	0.2 to 0.5	NA	<1	
396.6			19							
395.6	Same as above, soft to very stiff, color is more uniform and laminae are less apparent.		20	K		100	0.7 to 3.1	NA	<1	
394.6			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-401 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.6 Completion Depth 32.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374281.8 E.(Y) 786880.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff, light brownish gray 10YR 6/2.			L		100	1.2 to 1.6	NA	<1	
392.6			23							
391.6	Same as above, medium stiff to stiff. (Lacustrine)		24	M		88	0.6 to 1.5	NA	<1	
390.6			25							
389.6	Same as above, some laminae and possible varves present.		26	N		88	0.5 to 1.6	NA	<1	
388.6	**LEAN CLAY (CL),** 5%-10% silt, trace fine to coarse sand, occasional pebbles, plastic, zones of gray 10YR 5/1 and light olive brown 2.5Y 5/3, uniform color and texture, no odor, moist, stiff. (Till)		27							
387.6	Same as above, medium stiff to stiff.		28	O		100	0.6 to 1.0	NA	<1	
386.6			29							
385.6	Same as above, medium stiff.		30	P		100	0.5	NA	<1	
384.6			31							
383.6	**End of Boring at 32 feet.**		32							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-402 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.8 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374248.9 E.(Y) 786923.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5% to 10% clay, 5% to 10% fine to coarse sand, non-plastic, brownish yellow 10YR 6/6, no odor, dry, hard. (Fill)			A		100	NA	NA	<1	Grass at the surface.
414.8			1							
413.8	**LEAN CLAY (CL)**, 30%-50% silt, plastic to non-plastic, yellowish brown 10YR 5/6, no odor, moist, stiff.		2	B		100	1.0 to 1.6	NA	<1	
412.8			3							
411.8	Same as above, stiff to very stiff.		4	C		100	1.2 to 3.0	NA	<1	
410.8			5							
409.8	Same as above.		6	D		100	1.2 to 2.7	NA	<1	
408.8	**LEAN CLAY (CL)**, 10% to 20% silt, plastic to non-plastic, mottled brownish yellow 10YR 6/6 and light brownish yellow 10YR 6/2, some black staining, no odor, moist, stiff to very stiff. (Loess)		7							
407.8			8	E		100	1.7 to 3.0	NA	<1	
406.8			9							
405.8	Same as above, stiff, small zones of very dark gray 10YR 3/1.		10	F		100	1.0 to 1.2	NA	<1	Duplicate FDUP32/33-016-000919 collected.

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-402 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.8 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374248.9 E (Y) 786923.5

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
403.8	Same as above.		12	G		100	0.7 to 1.5	NA	<1	
402.8			13							
	SANDY SILT (SM), non-plastic, yellowish brown 10YR 5/6, no odor, wet, very soft to very stiff.									
401.8			14	H		100	0.2 to 2.5	NA	<1	
400.8			15							
399.8	**LEAN CLAY (CL)**, 10% silt, brownish yellow 10YR 6/6 and light yellowish brown 10YR 6/4, no odor, wet, laminae and possibly varves present, medium stiff. (Lacustrine)		16	I		100	0.5 to 1.0	NA	<1	
398.8			17							
397.8	Same as above, medium stiff to stiff.		18	J		100	0.5 to 1.2	NA	<1	
396.8			19							
395.8	Same as above, color is more uniform and laminae less apparent, medium stiff to very stiff.		20	K		100	0.5 to 2.5	NA	<1	
394.8			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-402 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.8 Completion Depth 28.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374248.9 E.(Y) 786923.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff to very stiff.			L		100	1.5 to 2.5	NA	<1	
392.8			23							
391.8	Same as above, vertical fracture present (gray staining), medium stiff to very stiff.		24	M		100	0.7 to 2.2	NA	<1	
390.8			25							
389.8	**LEAN CLAY (CL),** 10% to 20% silt, trace fine to coarse sand, occasional pebbles, plastic, gray 2.5Y 5/1, uniform color and texture, no odor, moist, medium stiff to very stiff. (Till)		26	N		100	0.7 to 1.7	NA	<1	
388.8			27							
387.8	**End of Boring at 28 feet.**		28							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-403 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 428.9 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374352.2 E.(Y) 786971.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% sand, 5%-10% clay, non-plastic, brownish yellow 10YR 6/6, moist to dry, medium stiff to stiff. (Fill)			A		83	0.4 to 1.5	NA	<1	
427.9			1							
426.9	Same as above, but dark grayish brown 10YR 3/2, some red bricks fragments, very stiff.		2	B		67	2.0 to 3.8	NA	<1	
425.9			3							
424.9	**LEAN CLAY (CL)**, 10%-30% silt, plastic to non-plastic, gray 5Y 5/1 to dark olive gray 5Y 3/2, no odor, moist. (Fill)		4	C		4	NR	NA	<1	
423.9			5							
422.9	Same as above.		6	D		4	NR	NA	<1	
421.9			7							
420.9	Same as above, medium stiff to stiff.		8	E		83	0.8 to 1.9	NA	<1	
419.9			9							
418.9	Same as above, very stiff to hard.		10	F		79	3.6 to 4.0	NA	<1	
417.9			11							
	SILT (ML), same as interval at 2' to 4' bgs. (Fill)									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-403 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 428.9 Completion Depth 44.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374352.2 E (Y) 786971.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				G		100	0.7 to 4.3	NA	<1	
415.9			13							
414.9	LEAN CLAY (CL), same as interval at 4' to 6' bgs, stiff. (Fill)		14	H		100	1.5 to 4.5	NA	<1	
413.9			15							
412.9	SILT (ML), same as interval at 2' to 4' bgs, hard. (Fill)		16	I		96	2.2 to 3.0	NA	<1	
411.9	LEAN CLAY (CL), 10% to 30% silt, plastic to non-plastic, mottled brownish yellow 10YR 6/6 and gray 2.5Y 6/1, no odor, moist, very stiff. (Loess)		17							
410.9	Same as above, very stiff.		18	J		88	2.8 to 3.5	NA	31	
409.9			19							
408.9	Same as above, stiff to very stiff.		20	K		100	1.4 to 3.3	NA	53	
407.9			21							
406.9	Same as above, soft to very stiff.		22	L		100	0.3 to 2.2	NA	58	
405.9			23							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-403 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 428.9 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374352.2 E.(Y) 786971.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff to very stiff.			M		100	1.4 to 2.8	NA	55	
403.9			25							
402.9	Same as above, medium stiff to stiff.		26	N		100	0.5 to 2.0	NA	57	
401.9			27							
400.9	Same as above.		28	O		100	0.4 to 2.2	NA	88	
399.9	**LEAN CLAY (CL)**, 5%-20% silt, plastic to non-plastic, yellowish brown 10YR 5/6 and light olive brown 2.5Y 5/4, no odor, wet, soft to stiff, laminated, varves. (Lacustrine)		29							
398.9			30	P		100	0.4 to 1.5	NA	22	
397.9			31							
396.9	Same as above.		32	Q		100	0.4 to 1.5	NA	14	
395.9			33							
394.9	Same as above, stiff.		34	R		100	1.5 to 1.5	NA	11	
393.9			35							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-403 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 428.9 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374352.2 E.(Y) 786971.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 5%-10% silt, trace fine to coarse sand, occasional pebbles, plastic, yellowish brown 10YR 5/4, no odor, wet, very stiff. (Till)			S		100	2.2 to 2.7	NA	7	
391.9			37							
390.9	Same as above, stiff to very stiff.		38	T		100	1.5 to 3.5	NA	<1	
389.9			39							
388.9	Same as above, stiff.		40	U		100	1.2 to 1.8	NA	<1	
387.9			41							
386.9	Same as above.		42	V		100	1.5 to 2.0	NA	<1	
385.9			43							
384.9	**End of Boring at 44 feet.**		44							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-404 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.7 Completion Depth 30.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374201.8 E.(Y) 786970.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5% to 10% clay, 5% to 10% fine to coarse sand, non-plastic, brownish yellow 10YR 6/6, no odor, dry, very stiff. (Fill)			A		100	2.0 to 3.0	NA	<1	Grass at the surface.
414.7			1							
413.7	**LEAN CLAY (CL)**, 10%-20% silt, plastic to non-plastic, yellowish brown 10YR 5/6, no odor, moist, stiff.		2	B		100	1.5 to 1.8	NA	<1	
412.7			3							
411.7	Same as above, stiff to very stiff.		4	C		100	1.5 to 3.8	NA	<1	
410.7			5							
409.7	Same as above, but mottled brownish yellow 10YR 6/6 and light brownish yellow 10YR 6/2, very stiff. (Loess)		6	D		100	2.0 to 3.2	NA	<1	
408.7			7							
407.7	Same as above, stiff to very stiff, small zones (1cm or less) of very dark gray 10YR 3/1.		8	E		100	1.8 to 2.5	NA	<1	
406.7			9							
405.7	Same as above.		10	F		100	1.8 to 2.3	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-404 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.7 Completion Depth 30.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374201.8 E.(Y) 786970.4

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL: G - K. Baker; D - G. Swift; H - R. Hoin; H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
403.7	Same as above, medium stiff to stiff. (Loess)		12	G		100	0.5 to 1.2	NA	<1	
402.7			13							
401.7	Same as above.		14	H		100	0.5 to 1.2	NA	<1	
400.7			15							
399.7	LEAN CLAY (CL), 10% silt, brownish yellow 10YR 6/6 and light yellowish brown 10YR 6/4, no odor, wet, medium stiff to stiff, laminae present. (Lacustrine)		16	I		88	0.7 to 1.2	NA	<1	
398.7			17							
397.7	Same as above, medium stiff to stiff.		18	J		96	0.5 to 1.5	NA	<1	
396.7			19							
395.7	Same as above, color more uniform, laminae less apparent, medium stiff to very stiff.		20	K		100	1.2 to 2.5	NA	<1	
394.7			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-404 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.7 Completion Depth 30.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/19/00 Finish 9/19/00

UTM (or State Plane) Coord. N.(X) 374201.8 E.(Y) 786970.4

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	2.5 to 3.2	NA	<1	
392.7			23							
391.7	**LEAN CLAY (CL)**, 10% to 20% silt, 5% to 30% sand, plastic to nonplastic, no odor, wet, very stiff to hand. (Till)		24	M		96	2.5 to 4.5	NA	<1	
390.7	Small cobble at 25.2' bgs, 10% to 20% gravel (near cobble size).		25							
389.7			26	N		100	1.2 to 2.0	NA	<1	Hit refusal, likely a cobble, moved north 3 feet to finish boring.
388.7	Same as above, less gravel, stiff.		27							
387.7	Same as above, stiff to very stiff.		28	O		100	1.4 to 2.2	NA	<1	
386.7			29							
385.7	**End of Boring at 30 feet.**		30							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-405 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.0 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374464.3 E.(Y) 787046.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% sand, 5%-10% clay, non-plastic, brownish yellow 10YR 6/6, no odor, moist to dry, very hard. (Fill)			A		100	>4.5	NA	<1	Grass at the surface.
431.0			1							
430.0	Same as above, but dark grayish brown 10YR 3/2, stiff, some red brick fragments, some cobbles.		2	B		100	1.5	NA	<1	
429.0			3							
428.0	**LEAN CLAY (CL)**, plastic, gray 2.5Y 6/1 to dark gray 2.5Y 4/1, moist, no odor, very stiff. (Fill)		4	C		88	2.4 to 2.9	NA	<1	
427.0			5							
426.0	Same as above.		6	D		92	2.5 to 2.8	NA	<1	
425.0			7							
424.0	Same as above, stiff to very stiff.		8	E		100	1.8 to 2.5	NA	<1	
423.0	**SILT (ML)**, as in interval 2' to 4' bgs above.		9							
422.0	**LEAN CLAY (CL)**, as at 4' bgs.		10	F		100	1.8 to 2.3	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-405 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.0 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N (X) 374464.3 E (Y) 787046.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
420.0	Same as above, stiff to very stiff, fragments of red brick.		12	G		100	1.4 to 2.7	NA	<1	
419.0			13							
418.0	Same as above.		14	H		96	1.1 to 3.2	NA	<1	
417.0			15							
416.0	Same as above, stiff to hard, zone of cobbles at 16.4' to 17.0' bgs.		16	I		84	1.2 to >4.5	NA	<1	
415.0			17							
414.0	Same as above, very soft to stiff.		18	J		71	0.2 to 1.0	NA	<1	
413.0			19							
412.0	Same as above, but higher silt concentration (approx. 30%), stiff to hard, contains tarpaulin.		20	K		88	1.5 to 4.5	NA	<1	
411.0			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-405 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.0 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374464.3 E.(Y) 787046.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff to very stiff, contains ceramic glazed cobbles.			L		92	1.0 to 2.7	NA	<1	
409.0			23							
408.0	**SILT (ML)**, same as in interval 2' to 4' bgs, but wet. (Fill)		24	M		75	1.0 to 2.2	NA	<1	
407.0			25							
406.0	Same as above, medium stiff to very stiff.		26	N		67	0.7 to 3.2	NA	<1	
405.0			27							
404.0			28	O		100	1.7 to 3.6	NA	<1	
403.0	**LEAN CLAY (CL)**, 10%-30% silt, plastic to non-plastic, mottled brownish yellow 10YR 6/6 and gray 2.5Y 6/1, no odor, moist, stiff to very stiff. (Loess)		29							
402.0			30	P		100	1.7 to 2.4	NA	<1	
401.0	**LEAN CLAY (CL)**, 5%-10% silt, plastic, yellowish brown 10YR 5/6 and light olive brown 2.5Y 5/4, no odor, moist, laminae present. (Lacustrine)		31							
400.0	Same as above, medium stiff to stiff, varves.		32	Q		100	0.7 to 2.2	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-405 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.0 Completion Depth 48.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374464.3 E (Y) 787046.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
398.0	Same as above, stiff.		34	R		100	1.2 to 1.7	NA	<1	
397.0			35							
396.0	Same as above, but more uniform color, light olive brown 2.5Y 5/6, less apparent laminae, medium stiff to stiff. (Lacustrine)		36	S		100	0.7 to 1.0	NA	<1	
395.0			37							
394.0	Same as above, medium stiff to very stiff.		38	T		100	0.7 to 2.2	NA	<1	
393.0			39							
392.0	Same as above, stiff.		40	U		100	1.3 to 1.7	NA	<1	
391.0			41							
390.0			42	V		100	1.7 to 3.0	NA	<1	
389.0	LEAN CLAY (CL), 5% to 10% silt, trace fine to coarse sand, occasional pebbles, plastic, yellowish brown 10YR 5/4 to brown 10YR 5/3, no odor, moist, stiff to very stiff. (Till)		43							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-405 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.0 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374464.3 E.(Y) 787046.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			W		100	1.9 to 2.2	NA	<1	
387.0			45							
386.0	Same as above, but zones of gray 2.5Y 6/1.		46	X		100	1.5 to 2.2	NA	<1	
385.0			47							
384.0	**End of Boring at 48 feet.**		48							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-406 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 429.8 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 374294.8 E.(Y) 787042.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 5%-10% sand, 30%-40% silt, plastic to non-plastic, brownish yellow 10YR 6/6, no odor, moist, hard. (Fill)			A		88	4.0	NA	<1	Grass at the surface.
428.8			1							
	SILT (ML), 5%-10% fine sand, organic rich, non-plastic, very dark grayish brown 10YR 3/2, no odor, moist, soft. (Fill)						<0.5			
427.8			2	B		96	2.5	NA	<1	
426.8	**LEAN CLAY (CL),** 5%-10% fine to coarse sand, 10%-20% fine gravel, 10%-20% silt, plastic to non-plastic, brown 10YR 4/3, no odor, moist, very stiff. (Fill)		3							
425.8	**LEAN CLAY (CL),** 10%-40% silt, trace gravel, trace fine sand, plastic to non-plastic, mottled yellowish brown 10YR 5/4 and pale brown 10YR 6/3, no odor, moist, medium stiff to stiff. (Fill)		4	C		50	0.5 to 1.2	NA	<1	
424.8			5							
423.8	Same as above, becomes more dark gray 10YR 4/1, stiff to very stiff.		6	D		58	1.2 to 2.6	NA	<1	
422.8			7							
421.8	Same as above, hard.		8	E		75	>4.5	NA	<1	
420.8	Construction debris, fiber board, aluminum, laminated insulation, wood, and silt at 9' to 10' bgs.		9							
419.8	**SILT (ML),** 10%-20% fine sand, 20% clay, dark grayish brown 10YR 4/2, no odor, moist, some brick and ceramic pieces, very stiff. (Fill)		10	F		84	3.0 to 3.7	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No: SB-406 — Monitor Well No: _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 429.8 — Completion Depth: 36.0

Fed. ID. No: _____ — Auger Depth: _____ — Rotary Depth: _____

Quadrangle: SW 1/4 of NW 1/4 — Sec. 32 — T. 9 S — R 2 E — Date: Start 9/14/00 — Finish 9/14/00

UTM (or State Plane) Coord. N.(X): 374294.8 — E.(Y): 787042.0

Latitude ___° ___' ___" — Longitude ___° ___' ___"

Boring Location: Area 9 Repository

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
417.8	Same as above, stiff to very stiff.		12	G		71	1.7 to 2.2	NA	<1	
416.8			13							
415.8	Same as above, but more clay (30%-50%), stiff, contains a cobble.		14	H		88	1.2 to 1.5	NA	<1	
414.8			15							
413.8	LEAN CLAY (CL), 30%-50% silt, plastic to non-plastic, very dark gray 10YR 3/1, no odor, moist, medium stiff. (Native)		16	I		17	0.7	NA	<1	
412.8			17							
411.8	Same as above, medium stiff.		18	J		25	0.7	NA	<1	
410.8			19							
409.8	Same as above, medium stiff to stiff.		20	K		83	0.7 to 1.7	NA	2	
408.8			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-406 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 429.8 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 374294.8 E.(Y) 787042.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but mottled, strong brown 7.5YR 5/6 and brownish yellow 10YR 6/6, stiff to hard.			L		96	1.7 to 4.2	NA	17	
406.8			23							
405.8	Same as above, stiff to very stiff.		24	M		100	1.7 to 2.5	NA	2	
404.8			25							
403.8	Same as above, medium stiff to very stiff.		26	N		100	0.5 to 2.3	NA	6	
402.8			27							
401.8	**SILTY SAND (SM)**, fine sand, non-plastic, brownish yellow 10YR 6/6, no odor, wet, very soft to stiff.		28	O		100	0.5 to 1.2	NA	2	
400.8			29						10	
399.8	**LEAN CLAY (CL)**, plastic, light yellowish brown 10YR 6/4, no odor, wet, somewhat thixotropic. (Lacustrine)		30	P		100	1.0 to 1.7	NA	2	Very faint laminae in QC sample.
398.8			31							
397.8	Same as above, soft.		32	Q		100	0.5	NA	2	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-406 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 429.8 Completion Depth 36.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 374294.8 E (Y) 787042.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
395.8	Same as above, soft to stiff.		34	R		100	0.5 to 1.2	NA	<1	
394.8			35							
393.8	End of Boring at 36 feet.		36							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-407 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.9 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374373.2 E.(Y) 787119.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% fine to coarse sand, 5%-10% clay, non-plastic, brownish yellow 10YR 6/6, no odor, moist to dry, hard. (Fill)			A		100	4.2	NA	<1	Grass at the surface.
431.9			1							
430.9	Same as above, but dark grayish brown 10YR 3/2, very stiff, some red brick fragments, some cobbles.		2	B		100	2.2 to 2.4	NA	<1	
429.9	Zone of lean clay from 3.3' to 3.7' bgs.		3							
428.9	Same as above, stiff.		4	C		100	1.6 to 2.0	NA	<1	
427.9			5							
426.9	Same as above.		6	D		100	1.2 to 2.0	NA	<1	
425.9			7							
424.9	Same as above, stiff to very stiff.		8	E		100	1.5 to 3.0	NA	<1	
423.9			9							
422.9	Same as above.		10	F		100	1.2 to 2.5	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-407 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.9 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374373.2 E (Y) 787119.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
420.9	Same as above, stiff, varies in clay content (5% to 30%).		12	G		71	1.0 to 1.5	NA	<1	
419.9			13							
418.9	Same as above.		14	H		83	1.2 to 1.8	NA	<1	
417.9			15							
416.9	Same as above, stiff to very stiff.		16	I		58	1.4 to 2.2	NA	<1	
415.9			17							
414.9	Same as above, stiff.		18	J		67	1.0 to 1.4	NA	<1	
413.9			19							
412.9	Same as above, soft to stiff.		20	K		67	0.4 to 1.7	NA	<1	
411.9			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-407 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.9 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374373.2 E.(Y) 787119.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff.			L		71	1.0 to 1.7	NA	<1	
409.9			23							
408.9	Same as above, stiff to very stiff.		24	M		100	1.7 to 2.2	NA	<1	
407.9			25							
406.9	Same as above, stiff.		26	N		100	1.0 to 1.5	NA	<1	
405.9			27							
	LEAN CLAY (CL), 10%-20% silt, trace fine sand, plastic to non-plastic, brownish yellow 10YR 6/6 and gray 2.5Y 6/1 mottled, no odor, moist, stiff. (Loess)								<1	
404.9			28	O		100	1.0 to 2.0	NA	<1	
403.9			29							
402.9	Same as above, stiff to very stiff.		30	P		100	1.8 to 2.3	NA	<1	
401.9			31							
400.9	Same as above, very soft.		32	Q		67	0.3	NA	11	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-407 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.9 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N (X) 374373.2 E (Y) 787119.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
398.9	LEAN CLAY (CL), 5%-10% silt, plastic, yellowish brown 10YR 5/6 and light olive brown 2.5Y 5/4, no odor, moist, medium stiff to very stiff, laminae present. (Lacustrine)		34	R		54	0.7 to 2.5	NA	12	
397.9			35							
396.9	Same as above, soft to medium stiff.		36	S		100	0.3 to 0.7	NA	48	
395.9			37							
394.9	Same as above, medium stiff to very stiff.		38	T		100	0.8 to 2.6	NA	45	
393.9			39							
392.9	Same as above, very stiff.		40	U		100	2.5 to 3.0	NA	4	
391.9			41							
390.9	Same as above, stiff.		42	V		100	1.5	NA	<1	
389.9			43							
	LEAN CLAY (CL), 5%-10% silt, trace fine to coarse sand, some occasional pebbles.									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-407 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.9 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/18/00 Finish 9/18/00

UTM (or State Plane) Coord. N.(X) 374373.2 E.(Y) 787119.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	plastic, dark grayish brown 2.5Y 4/2 to gray 2.5Y 5/1, no odor, moist, medium stiff to stiff. (Till)			W		100	0.8 to 1.8	NA	<1	
387.9			45							
386.9			46	X		100	1.5	NA	<1	
385.9			47							
384.9	**End of Boring at 48 feet.**		48							

(950226)

3A

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-408 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.0 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374378.6 E.(Y) 787188.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% fine to coarse sand, 5% to 10% clay, non-plastic, brownish yellow 10YR 6/6, no odor, moist to dry, hard. (Fill)			A		100	4.5	NA	<1	Grass at the surface.
430.0			1							
429.0	Same as above, but dark grayish brown 10YR 3/2, some red brick fragments, soft to very stiff.		2	B		100	0.2 to 2.2	NA	<1	
428.0			3							
427.0	Same as above, stiff to very stiff.		4	C		83	1.8 to 2.5	NA	<1	
426.0			5							
425.0	Same as above.		6	D		88	1.8 to 2.4	NA	<1	
424.0			7							
423.0	Same as above.		8	E.		88	1.8 to 2.0	NA	<1	
422.0			9							
421.0	Same as above.		10	F		92	1.5 to 1.8	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-408 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.0 Completion Depth 48.0

Fed. ID. No _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374378.6 E (Y) 787188.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
419.0	LEAN CLAY (CL), plastic, gray 2.5Y 6/1, no odor, moist, medium stiff to stiff. (Fill)		12	G		79	0.8 to 1.2	NA	<1	
418.0			13							
417.0	3 zones of fine sand, each 2" thick. One each at 13.8', 14.2', and 15.7' bgs. Tarpaulin found at each sand interval.		14	H		71	0.2 to 1.0	NA	<1	
416.0			15							
415.0			16	I		0	NA	NA	NA	No recovery.
414.0			17							
413.0			18	J		0	NA	NA	NA	No recovery.
412.0			19							
411.0	LEAN CLAY (CL), as above, also contains dark gray 2.5Y 4/1, soft to medium stiff.		20	K		67	0.4 to 0.6	NA	<1	
410.0			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-408 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.0 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374378.6 E.(Y) 787188.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				L		54	0.4 to 1.8	NA	<1	
408.0	**SILT (ML)**, as in interval at 2' to 4' bgs above, but wet, soft to stiff.		23							
407.0	Same as above, medium stiff to stiff, wet.		24	M		100	0.7 to 1.7	NA	<1	
406.0	**LEAN CLAY (CL)**, 10%-30% silt, plastic to non-plastic, mottled yellowish brown 10YR 5/8 with gray 2.5Y 6/1, no odor, moist. (Loess)		25							
405.0			26	N		100	2.0 to 3.3	NA	7	
404.0			27							
403.0	Same as above, stiff to very stiff.		28	O		83	1.5 to 2.2	NA	23	
402.0			29							
401.0	Same as above.		30	P		88	1.8 to 2.4	NA	22	
400.0			31							
399.0	**LEAN CLAY (CL)**, as above, less mottling, no laminae are apparent, very soft to medium stiff. (Lacustrine)		32	Q		100	<0.2 to 0.5	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-408 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.0 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374378.6 E (Y) 787188.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
397.0	Same as above, color more uniform with depth, all clay is light yellowish brown 2.5Y 6/4, no structure apparent, stiff.		34	R		96	1.0 to 2.0	NA	<1	
396.0			35							
395.0	Same as above.		36	S		100	1.0 to 1.6	NA	<1	
394.0			37							
393.0	Same as above, medium stiff to stiff.		38	T		100	0.5 to 1.6	NA	<1	
392.0			39							
	LEAN CLAY (CL), 10%-20% silt, trace fine to coarse sand, occasional pebbles, plastic, yellowish brown 10YR 5/4, no odor, moist, stiff. (Till)									
391.0			40	U		100	1.0 to 2.0	NA	<1	
390.0			41							
389.0	Same as above, but color is gray 2.5Y 6/1, medium stiff to stiff.		42	V		100	0.5 to 1.8	NA	<1	
388.0			43							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-408 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.0 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374378.6 E.(Y) 787188.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, medium stiff.			W		100	0.5 to 1.0	NA	<1	
386.0			45							
385.0	Same as above, very soft to very stiff.		46	X		100	0.2 to 3.2	NA	<1	
384.0			47							
383.0	**End of Boring at 48 feet.**		48							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-409 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.5 Completion Depth 60.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 374313.1 E.(Y) 787174.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% fine sand, non-plastic, no odor, moist to dry, brownish yellow 10YR 6/6, at 6" color changes to very dark grayish brown 10YR 3/2, organic rich, brick pieces. (Fill)			A		100	1.0 to 4.5	NA	<1	Grass at the surface.
431.5			1							
430.5	Same as above, trace fine gravel, stiff. Thin layer of clay at 2.3' to 2.9' bgs.		2	B		100	1.0 to 1.7	NA	<1	
429.5			3							
428.5	Same as above, stiff to very stiff.		4	C		100	1.0 to 3.0	NA	<1	
427.5			5							
426.5	Same as above, medium stiff to stiff.		6	D		100	0.7 to 1.7	NA	<1	
425.5			7							
424.5	Same as above, very stiff.		8	E		100	2.5 to 3.5	NA	<1	
423.5			9							
422.5	Same as above.		10	F		100	2.2 to 3.2	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-409 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.5 Completion Depth 60.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord N.(X) 374313.1 E (Y) 787174.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
420.5	Same as above, varying amounts of clay, stiff to very stiff.		12	G		71	1.5 to 2.7	NA	<1	
419.5			13							
418.5	Same as above, very stiff.		14	H		100	2.2 to 4.0	NA	<1	
417.5			15							
416.5	Same as above, medium stiff to stiff.		16	I		75	0.5 to 2.0	NA	<1	
415.5			17							
414.5	**LEAN CLAY (CL)**, 10%-40% silt, trace fine sand, plastic to non-plastic, mottled gray 2.5Y 6/1 with light yellowish brown 2.5Y 6/3, no odor, moist, medium stiff to stiff. (Fill)		18	J		92	0.7 to 1.2	NA	<1	
413.5			19							
412.5	Same as above, but color is dark brown 10YR 3/3 between 20.2' and 20.4' bgs, stiff.		20	K		71	1.0 to 1.7	NA	<1	
411.5			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-409 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.5 Completion Depth 60.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 374313.1 E.(Y) 787174.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above (as at 18' to 20' bgs interval), gray and light yellow brown, stiff to very stiff.			L		88	1.7 to 2.7	NA	<1	
409.5			23							
	Wood pieces at 23.7' bgs.									
408.5	Same as above, medium stiff.		24	M		84	0.5 to 1.0	NA	<1	
407.5			25							
	Becomes very dark gray 5Y 3/1 at 25.5' bgs.									
406.5	**SILT (ML)**, varying amounts of clay (10%-30%), non-plastic, organic rich, some wood pieces, very dark grayish brown 10YR 3/2, no odor, moist, stiff. (Fill)		26	N		96	1.2 to 2.0	NA	<1	
405.5			27							
404.5	Same as above, wet, medium stiff to stiff.		28	O		100	0.5 to 1.7	NA	<1	
403.5			29							
402.5	**LEAN CLAY (CL)**, 30%-40% silt, plastic to non-plastic, mottled brownish yellow 10YR 6/6 with gray 10YR 6/1. (Fill)		30	P		100	0.5 to 3.5	NA	<1	
401.5	**SILT (ML)**, as above, with organic matter. (Fill)		31							
	SILTY SAND (SM), non-plastic, brownish yellow 10YR 6/6, no odor, wet. (Fill)								5	
400.5			32	Q		100	0.5 to 2.0	NA	32	
	LEAN CLAY (CL), plastic, light yellowish									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-409 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.5 Completion Depth 60.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N (X) 374313.1 E (Y) 787174.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	brown 10YR 6/4, no odor, wet, soft to stiff.									
398.5	Same as above, medium stiff, some zones are finely laminated. (Lacustrine)		34	R		100	0.5 to 1.0	NA	143	Duplicate FDUP32/33-005-000914 collected.
397.5			35							
396.5	Same as above, uniform color, olive brown 2.5Y 4/3, no odor, wet, stiff.		36	S		100	1.5 to 2.0	NA	26	Trace very fine gravel in QC samples S thru X - samples do not look like till. Gravel is very fine, and occurs on order of 1 piece per QC sample.
395.5			37							
394.5	Same as above.		38	T		100	1.0 to 1.5	NA	<1	
393.5			39							
392.5	Same as above, but grayish brown 2.5Y 5/1.		40	U		88	1.0 to 1.5	NA	<1	
391.5			41							
390.5	Same as above, medium stiff to very stiff.		42	V		88	0.7 to 2.5	NA	<1	
389.5			43							
	Clay at 43.4' bgs is very stiff and yellowish brown 10YR 6/6.									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-409 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.5 Completion Depth 60.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 374313.1 E.(Y) 787174.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, grayish brown 10YR 5/2, soft.			W		96	0.5	NA	<1	
387.5			45							
386.5	Same as above, soft to medium stiff.		46	X		96	0.4 to 1.0	NA	<1	
385.5			47							
384.5	**LEAN CLAY (CL),** as above, trace fine to coarse sand, trace fine gravel, dark gray 5Y 4/1, stiff to very stiff. (Till)		48	Y		100	1.0 to 2.2	NA	<1	
383.5			49							
382.5	Same as above, medium stiff to stiff, occasional pebbles, fine sand stringers.		50	Z		100	0.5 to 1.5	NA	<1	
381.5			51							
380.5	Same as above, very stiff.		52	AA		100	2.0 to 4.0	NA	<1	
379.5			53							
378.5	Same as above, medium stiff to very stiff.		54	BB		100	0.6 to 3.5	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-409 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.5 Completion Depth 60.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/14/00 Finish 9/14/00

UTM (or State Plane) Coord. N.(X) 374313.1 E.(Y) 787174.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
376.5	Same as above, medium stiff to stiff.		56	CC		100	0.5 to 2.0	NA	<1	
375.5			57							
374.5	Same as above.		58	DD		100	0.7 to 1.8	NA	<1	
373.5			59							
372.5	End of Boring at 60 feet.		60							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-410 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.7 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374265.4 E.(Y) 787173.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% fine sand, 5%-10% clay, trace fine gravel, non-plastic, light yellowish brown 10YR 6/4, no odor, moist to dry, medium stiff to stiff. (Fill)			A		100	0.8 to 1.5	NA	<1	Grass at the surface.
431.7	Same as above, but dark grayish brown 10YR 4/2, some gravel, red brick pieces, soft to stiff.		1							
430.7			2	B		100	0.2 to 1.5	NA	<1	
429.7			3							
428.7	Same as above, stiff to very stiff, moist.		4	C		100	1.5 to 3.0	NA	<1	
427.7			5							
426.7	Same as above, stiff.		6	D		100	1.8 to 2.0	NA	<1	
425.7			7							
424.7	Same as above.		8	E		100	1.2 to 1.8	NA	<1	
423.7			9							
422.7	Same as above, medium stiff to stiff.		10	F		100	0.7 to 2.0	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County: Williamson — Boring No: SB-410 — Monitor Well No. _____

Site File Name: Crab Orchard National Wildlife Refuge — Surface Elevation: 432.7 — Completion Depth: 48.0

Fed. ID. No. _____ — Auger Depth _____ — Rotary Depth _____

Quadrangle: SW 1/4 of NW 1/4 — Sec: 32 — T: 9 S — R: 2 E — Date: Start: 9/15/00 — Finish: 9/15/00

UTM (or State Plane) Coord. N.(X): 374265.4 — E (Y): 787173.2

Latitude ___ ° ___ ' ___ " — Longitude ___ ° ___ ' ___ "

Boring Location: Area 9 Repository

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
420.7	Same as above, stiff to very stiff.		12	G		100	1.5 to 2.4	NA	<1	
419.7			13							
418.7	Same as above, wood pieces.		14	H		100	1.4 to 2.2	NA	<1	
417.7			15							
416.7	Same as above, medium stiff.		16	I		80	0.7	NA	<1	
415.7	**LEAN CLAY (CL), 10%-30% silt, plastic, gray 5Y 5/1, no odor, moist, medium stiff to very stiff. (Fill)**		17							
414.7			18	J		100	0.7 to 2.2	NA	<1	
413.7			19							
412.7	Thin layer of fine sand at 20.0' to 20.3' bgs. **SILT (ML), as in interval at 2' to 4' bgs above, medium stiff to very stiff. (Fill)**		20	K		100	0.7 to 3.0	NA	<1	
411.7			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-410 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.7 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374265.4 E.(Y) 787173.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Increase in fine to coarse sand content with depth to a silty sand, wet, very soft to very stiff, contains some red brick pieces.			L		100	0.2 to 2.2	NA	<1	
409.7			23							
408.7	**LEAN CLAY (CL),** plastic, dark gray 2.5Y 4/1, no odor, moist to wet, soft to medium stiff. (Fill)		24	M		88	0.2 to 0.7	NA	<1	
407.7			25							
406.7	**SILT (ML),** same as interval at 2' to 4' bgs above, medium stiff to stiff. (Fill)		26	N		88	0.9 to 1.7	NA	<1	
405.7			27							
404.7			28	O		92	3.1 to 4.3	NA	8	
403.7	**LEAN CLAY (CL),** plastic, mottled brownish yellow 10YR 6/6 with gray 10YR 6/1, no odor, moist, very stiff to hard. (Native)		29							
402.7			30	P		92	0.7 to 1.0	NA	14	
401.7	**SILTY SAND (SM),** non-plastic, yellowish brown 10YR 5/6, no odor, wet, loose to medium dense.		31							
400.7	**LEAN CLAY (CL),** plastic, brown 10YR 5/3 and brownish yellow 10YR 6/6, no odor, moist, laminated to finely layered, soft to very stiff. (Lacustrine)		32	Q		100	0.2 to 2.2	NA	6	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-410 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.7 Completion Depth 48.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374265.4 E (Y) 787173.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
398.7	Same as above, soft to stiff.		34	R		100	0.2 to 1.5	NA	17	
397.7			35							
396.7	Same as above, medium stiff to very stiff.		36	S		100	0.6 to 2.2	NA	54	
395.7			37							
394.7	Same as above, stiff to very stiff.		38	T		100	1.2 to 2.5	NA	36	
393.7			39							
392.7	Same as above, occasional pebbles, sandy interbeds.		40	U		100	1.3 to 2.0	NA	15	
391.7			41							
390.7	Same as above.		42	V		100	1.0 to 2.0	NA	6	
389.7			43							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-410 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.7 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374265.4 E.(Y) 787173.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 5%-10% silt, trace fine to coarse sand, occasional pebbles, plastic, gray 2.5Y 5/1, no odor, moist to wet, medium stiff. (Till)			W		100	0.6 to 0.8	NA	<1	
387.7			45	-		-				
386.7	Same as above.		46	X		100	0.5 to 1.0	NA	<1	
385.7			47							
384.7	**End of Boring at 48 feet.**		48							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-411 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.7 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374168.8 E.(Y) 787153.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% fine to coarse sand, 5% to 10% clay, non-plastic, brownish yellow 10YR 6/6, no odor, moist to dry, soft to hard. (Fill)			A		100	0.5 to 4.5	NA	<1	Grass at the surface.
430.7			1							
429.7	Same as above, but dark grayish brown 10YR 3/2, medium stiff to very stiff, some brick fragments.		2	B		100	0.8 to 3.2	NA	<1	
428.7			3							
427.7	**LEAN CLAY (CL),** 10% silt, gray 2.5Y 5/1 and dark gray 2.5Y 4/1, plastic to non-plastic, no odor, moist. (Fill) Same as above, stiff.		4	C		50	1.5	NA	<1	
426.7			5							
425.7	**SILT (ML),** same as interval 2' to 3' bgs above, wooden stick fragments. (Fill)		6	D		100	2.5 to 2.8	NA	<1	
	LEAN CLAY (CL), same as interval at 4' bgs above. (Fill)									
424.7	**SILT (ML),** same as interval 2' to 3' bgs above, very stiff. (Fill)		7							
423.7	Same as above, very stiff.		8	E		75	2.5 to 3.2	NA	<1	
422.7			9							
421.7	Same as above.		10	F		71	3.2 to 4.0	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-411 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.7 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374168.8 E (Y) 787153.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
419.7	Same as above, stiff to very stiff.		12	G		88	1.7 to 3.2	NA	<1	
418.7			13							
417.7	Same as above, very stiff.		14	H		92	2.0 to 2.2	NA	<1	
416.7			15							
415.7	Same as above, stiff to very stiff.		16	I		92	1.7 to 2.6	NA	<1	
414.7			17							
413.7	Same as above, very stiff.		18	J		92	2.2 to 2.4	NA	<1	
412.7			19							
411.7	Same as above, medium stiff to stiff, zones of gray clay as in interval at 4' bgs.		20	K		54	0.9 to 1.2	NA	<1	
410.7			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-411 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.7 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374168.8 E.(Y) 787153.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, in interval at 18' to 20' bgs, stiff to very stiff.			L		67	1.2 to 2.7	NA	<1	
408.7			23							
407.7	Same as above, but wet, very soft.		24	M		46	<0.2	NA	<1	
406.7			25							
405.7	Same as above.		26	N		54	<0.2	NA	<1	
404.7			27							
403.7	**LEAN CLAY (CL),** 5%-30% silt, plastic to non-plastic, mottled yellowish brown 10YR 5/8 with gray 2.5Y 6/1, no odor, moist, medium stiff to very stiff. (Loess)		28	O		100	0.9 to 3.0	NA	12	
402.7			29							
401.7			30	P		100	0.3 to 0.5	NA	16	
400.7	**SILTY SAND (SM),** fine sand, 20%-40% silt, non-plastic, gray 2.5Y 6/1 and olive yellow 2.5Y 6/8, no odor, wet, loose.		31							
399.7			32	Q		100	<0.2 to 2.0	NA	23	
	LEAN CLAY (CL), 0%-30% silt, plastic to non-plastic, light olive brown 2.5Y 5/6, no									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-411 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.7 Completion Depth 52.0

Fed ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374168.8 E (Y) 787153.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	odor, wet, very soft to stiff, laminae present. (Lacustrine)									
397.7	Same as above.		34	R		100	<0.2 to 1.5	NA	124	
396.7			35							
395.7	Same as above, color more uniform, laminae less apparent, stiff to very stiff. (Lacustrine)		36	S		100	1.0 to 3.1	NA	1360	Duplicate FDUP32/33-011-000917 collected.
394.7			37							
393.7	Same as above, stiff.		38	T		100	1.1 to 1.8	NA	590	
392.7			39							
	LEAN CLAY (CL), 5%-20% silt, trace fine to coarse sand, occasional pebbles, plastic to non-plastic, light olive brown 2.5Y 5/4, no odor, moist to wet, soft to stiff, some zones are very plastic with little silt or sand. (Till)									
391.7			40	U		100	<0.2 to 1.6	NA	245	
390.7			41							
389.7	Same as above, stiff to very stiff.		42	V		100	1.3 to 2.6	NA		
388.7			43							
	SILTY SAND (SM), non-plastic, light olive brown 2.5Y 5/4, no odor, wet.								51	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-411 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.7 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/17/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374168.8 E.(Y) 787153.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), as in interval at 39.2' to 43.4' bgs. (Till)			W		100	NR	NA	142	
386.7			45							
	SILTY SAND (SM), same as at 44' bgs.								32	
385.7	**LEAN CLAY (CL)**, same as at 39.2' to 43.4' bgs. (Till)		46	X		100	NR	NA	58	
384.7			47							
383.7	Same as above, soft to very stiff.		48	Y		100	0.4 to 2.2	NA	144	
382.7			49							
381.7	Same as above, soft, but gray 2.5Y 6/1.		50	Z		100	0.4 to 0.5	NA	32	
380.7			51							
379.7	**End of Boring at 52 feet.**		52							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-412 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.1 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374199.8 E.(Y) 787185.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% fine to coarse sand, 5%-10% clay, trace fine gravel, non-plastic, brownish yellow 10YR 6/6, no odor, moist, dry, very stiff, to hard. (Fill)			A		100	2.4 to 4.3	NA	<1	Grass at the surface.
431.1			1							
430.1	Same as above, but dark grayish brown 10YR 3/2, very stiff, some red brick fragments.		2	B		100	2.3 to 2.7	NA	<1	
429.1			3							
428.1	Same as above, medium stiff to stiff.		4	C		100	0.8 to 1.8	NA	<1	
427.1			5							
426.1	Same as above.		6	D		100	0.5 to 1.5	NA	<1	
425.1			7							
424.1	**LEAN CLAY (CL),** from 8.0' to 8.5' bgs.		8	E		54	1.2 to 1.8	NA	<1	
423.1	**SILT (ML),** same as in interval 2' to 4' bgs, stiff.		9							
422.1	Same as above, medium stiff to stiff.		10	F		83	0.8 to 1.5	NA	<1	
421.1	**LEAN CLAY (CL),** 5%-10% sand, grayish brown 2.5Y 5/2 and brownish yellow 10YR 6/6, plastic to non-plastic, no odor, moist, medium stiff to stiff. (Fill)		11							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-412 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.1 Completion Depth 44.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date: Start 9/16/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374199.8 E (Y) 787185.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, very stiff.			G		63	2.2 to 4.0	NA	<1	
419.1			13							
418.1	Same as above, medium stiff to stiff.		14	H		67	0.7 to 1.5	NA	<1	
417.1			15							
416.1	Same as above, medium stiff.		16	I		4	0.7	NA	<1	
415.1			17							
414.1	Same as above, stiff.		18	J		4	1.5	NA	<1	
413.1			19							
412.1	Same as above, medium stiff.		20	K		96	0.4 to 0.7	NA	<1	
411.1			21							
410.1	Same as above.		22	L		100	0.5	NA	<1	
409.1			23							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-412 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.1 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374199.8 E.(Y) 787185.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), same as in interval 2' to 4' bgs, stiff, but wet.			M		100	1.0 to 2.0	NA	<1	
407.1			25							
406.1	Same as above.		26	N		100	1.0 to 1.7	NA	<1	
405.1			27							
404.1	Same as above, medium stiff to stiff.		28	O		92	0.5 to 1.2	NA	<1	
403.1			29							
402.1	Same as above.		30	P		88	0.6 to 1.2	NA	<1	
401.1			31							
400.1	Same as above.		32	Q		88	0.7 to 1.4	NA	<1	
399.1			33							
398.1	Same as above.		34	R		88	0.6 to 1.6	NA	<1	
397.1	**LEAN CLAY (CL)**, 10%-20% silt, plastic, yellowish brown 10YR 5/6 and light olive brown 2.5Y 5/4, no odor, moist to wet, medium stiff to stiff, laminae present. (Lacustrine)		35							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-412 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.1 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date: Start 9/16/00 Finish 9/17/00

UTM (or State Plane) Coord. N.(X) 374199.8 E (Y) 787185.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff.			S		88	1.2 to 1.5	NA	22	
395.1			37							
394.1			38	T		92	1.2 to 2.2	NA	28	
393.1	**LEAN CLAY (CL), 5%-20% silt, trace fine to coarse sand, occasional pebbles, plastic to non-plastic, yellowish brown 10YR 5/4, no odor, moist, stiff to very stiff. (Till)**		39							
392.1	Same as above.		40	U		71	1.2 to 3.0	NA	<1	
391.1			41							
390.1	Same as above, but gray 2.5Y 5/1, soft to stiff.		42	V		67	0.4 to 1.8	NA	<1	
389.1			43							
388.1	**End of Boring at 44 feet.**		44							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-413 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.7 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374310.2 E.(Y) 787204.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% fine sand, 10%-20% clay, non-plastic, brownish yellow 10YR 6/6, no odor, moist to dry. (Fill)			A		100	1.5	NA	<1	
430.7			1							
	Same as above, but dark grayish brown 10YR 3/2, stiff, occasional coarse gravel. (Fill)									
429.7	Same as above, medium stiff to stiff.		2	B		100	0.8 to 1.8	NA	<1	
428.7			3							
427.7	Same as above, stiff.		4	C		100	1.0 to 1.8	NA	<1	
426.7			5							
425.7	Same as above.		6	D		100	1.0 to 1.7	NA	<1	
424.7			7							
423.7	Same as above, stiff to very stiff, pieces of red brick.		8	E		100	1.5 to 3.2	NA	<1	
422.7			9							
421.7	Same as above, stiff. (Fill)		10	F		100	1.5	NA	<1	
420.7			11							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-413 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.7 Completion Depth 44.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374310.2 E.(Y) 787204.6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), plastic, dark gray 2.5Y 4/1 to grayish brown 2.5Y 5/2, no odor, moist, medium stiff to stiff, contains a piece of tarpaulin. (Fill)			G		58	0.8 to 1.8	NA	<1	
418.7			13							
417.7	Same as above, but no debris.		14	H		100	0.5 to 1.3	NA	<1	
416.7			15							
415.7	Same as above, varies in color from olive yellow 2.5Y 6/6 to black 2.5Y 2.5/1, piece of black wood, possibly charred.		16	I		79	0.5 to 1.0	NA	<1	
414.7			17							
413.7	Same as above, medium stiff to stiff.		18	J		96	0.5 to 1.2	NA	<1	
412.7			19							
411.7	Same as above, soft to stiff.		20	K		96	0.2 to 1.2	NA	<1	
410.7			21							
409.7	Same as above, soft, woody material. (Fill)		22	L		83	0.3 to 0.5	NA	<1	
408.7			23							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-413 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.7 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374310.2 E.(Y) 787204.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
406.7	**SILT (ML),** 5%-10% fine to coarse sand, 5%-10% clay, non-plastic, very dark grayish brown 10YR 3/2, no odor, wet, stiff, possibly organic rich. (Fill)		25	M		100	1.0 to 2.0	NA	<1	
405.7	Same as above, medium stiff.		26	N		100	0.5 to 0.8	NA	<1	
404.7			27							
403.7	Same as above, soft to stiff.		28	O		100	0.4 to 1.3	NA	<1	
402.7			29							
401.7	Same as above.		30	P		100	0.4 to 1.4	NA	<1	
400.7			31							
399.7	**LEAN CLAY (CL),** 5% fine to coarse sand, 10%-30% silt, plastic to non-plastic, mottled yellowish brown 10YR 5/6 with gray 10YR 5/1, no odor, moist, stiff. (Native)		32	Q		100	1.8 0.4 to 0.6	NA	36	
398.7	Same as above, soft, wet.		33							
397.7	Same as above, but finely laminated and not mottled, same colors, but some laminae are black, wet to moist, medium stiff to stiff. (Lacustrine)		34	R		100	0.4 to 1.8	NA	52	Duplicate FDUP32/33-006-000915 collected.
396.7	Thin silt layer from 34.1' to 34.3' bgs.		35							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-413 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.7 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374310.2 E (Y) 787204.6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, laminae less prevalent, but layering on a cm scale is still present, color is more uniform light olive brown 2.5Y 5/3, medium stiff. (Lacustrine)			S		100	0.8	NA	<1	
394.7			37							
393.7			38	T		100	0.6 to 1.8	NA	<1	
392.7			39							
	LEAN CLAY (CL), 5%-10% silt, trace fine to coarse sand and occasional pebbles, plastic, gray 2.5Y 5/1, no odor, moist to wet, soft. (Till)									
391.7			40	U		100	0.4	NA	<1	
390.7			41							
389.7	Same as above, soft to medium stiff.		42	V		100	0.4 to 0.8	NA	<1	
388.7			43							
387.7	End of Boring at 44 feet.		44							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-414 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.1 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374266.0 E.(Y) 787216.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% fine to coarse sand, 5%-10% clay, trace gravel, non-plastic, brownish yellow 10YR 6/6, no odor, moist to dry, stiff to hard. (Fill)			A		100	1.0 to 4.5	NA	<1	Grass at the surface.
431.1			1							
	Same as above, but dark grayish brown 10YR 3/2, some brick fragments, cobbles. (Sediment from lake dredging?)									
430.1			2	B		100	2.0 to 2.2	NA	<1	
429.1			3							
428.1	Same as above, stiff to very stiff.		4	C		100	1.8 to 2.7	NA	<1	
427.1			5							
426.1	Same as above, stiff.		6	D		100	1.3 to 1.5	NA	<1	
425.1			7							
424.1	Same as above, cobble.		8	E		100	1.5 to 1.8	NA	<1	
423.1			9							
422.1	**LEAN CLAY (CL)**, 20%-40% silt, 5%-10% sand, dark gray 2.5Y 4/1, no odor, moist, stiff.		10	F		100	1.3 to 2.3	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-414 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.1 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374266.0 E.(Y) 787216.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff to very stiff.									
420.1	Same as above, medium stiff.		12	G		46	0.7 to 1.0	NA	<1	
419.1			13							
418.1	Same as above.		14	H		63	0.4 to 0.7	NA	<1	
417.1			15							
416.1	Same as above, but dark greenish gray 10GY 4/1.		16	I		46	0.2 to 0.4	NA	<1	
415.1			17							
414.1	Same as above.		18	J		54	0.3 to 0.5	NA	<1	
413.1			19							
412.1	Same as above.		20	K		79	0.2 to 0.4	NA	<1	
411.1			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-414 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.1 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374266.0 E.(Y) 787216.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, contains a wood fragment.			L		83	0.4 to 0.7	NA	<1	
409.1			23							
408.1			24	M		67	1.2 to 2.5	NA	<1	
	SILT (ML), same as interval at 2' to 4' bgs, but wet, stiff to very stiff. (Fill)									Looks like sediment from lake dredging.
407.1			25							
406.1	Same as above.		26	N		100	1.0 to 2.7	NA	<1	
405.1			27							
404.1	Same as above, very soft to soft.		28	O		100	0.2 to 0.5	NA	<1	
403.1			29							
402.1			30	P		100	0.5	NA	5	
401.1			31							
400.1	**LEAN CLAY (CL)**, 5% fine to coarse sand, 10%-30% silt, plastic, yellowish brown 10YR 5/6 and gray 10YR 5/1, no odor, moist, stiff to very stiff, laminated.		32	Q		100	1.3 to 2.2	NA	157	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-414 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.1 Completion Depth 48.0

Fed ID No _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T 9 S R 2 E Date Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374266.0 E (Y) 787216.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL: G - K. Baker; D - G. Swift; H - R. Hoin; H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	(Lacustrine)								
398.1	Same as above, soft to stiff.	34	R		100	0.4 to 1.2	NA	58	
397.1		35							
396.1	Same as above, stiff. (Lacustrine)	36	S		100	1.1 to 1.9	NA	41	
395.1		37							
394.1	Same as above, more uniform, laminae less apparent.	38	T		100	1.2 to 1.4	NA	45	
393.1		39							
392.1	**LEAN CLAY (CL), 5%-10% silt, trace fine to coarse sand, occasional pebbles, plastic, yellowish brown 10YR 5/4, no odor, moist, medium stiff to very stiff. (Till)**	40	U		100	0.7 to 2.2	NA	67	
391.1		41							
390.1	Same as above.	42	V		100	0.7 to 2.2	NA	26	
389.1		43							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-414 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.1 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/15/00

UTM (or State Plane) Coord. N.(X) 374266.0 E.(Y) 787216.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, medium stiff.			W		100	0.5 to 1.0	NA	17	
387.1			45							
	Gray 2.5Y 5/1 at 45.7' bgs.									
386.1	Same as above, medium stiff to stiff.		46	X		100	0.5 to 1.2	NA	<1	
385.1			47							
	Yellowish brown again at 47.1' bgs.									
384.1	**End of Boring at 48 feet.**		48							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-415 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.2 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 374213.2 E.(Y) 787214.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% fine to coarse sand, 5%-10% clay, trace fine gravel, non-plastic, brownish yellow 10YR 6/6, no odor, moist to dry, very stiff to hard. (Fill)			A		100	2.5 to 4.5	NA	<1	
431.2			1							
430.2	Same as above, but dark grayish brown 10YR 3/2, stiff to very stiff, some red brick fragments.		2	B		100	1.5 to 2.6	NA	<1	
429.2			3							
428.2	Same as above.		4	C		100	1.5 to 2.6	NA	<1	
427.2			5							
426.2	Same as above.		6	D		100	1.3 to 1.5	NA	<1	
425.2			7							
424.2	**LEAN CLAY (CL),** 10%-20% silt, plastic to non-plastic, grayish brown 2.5Y 5/2 and olive gray 5Y 4/2, no odor, moist, stiff to very stiff. (Fill)		8	E		83	1.5 to 2.6	NA	<1	
423.2			9							
422.2	Same as above, wood pieces.		10	F		79	0.7 to 2.1	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-415 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.2 Completion Depth 52.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 374213.2 E (Y) 787214.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Bauer
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Fine sand at 11.0' to 11.2' bgs, tarpaulin immediately above sand, medium stiff to very stiff.									
420.2	Same as above, varies in color, including colors above to brown 10YR5/3.		12	G		63	0.7 to 1.9	NA	<1	
419.2			13							
418.2	Same as above, very soft to stiff.		14	H		58	<0.2 to 1.3	NA	<1	
417.2			15							
416.2	Same as above, medium stiff to stiff.		16	I		79	0.6 to 1.6	NA	<1	
415.2			17							
414.2	Same as above, stiff to very stiff.		18	J		67	1.0 to 2.2	NA	<1	
413.2			19							
412.2	Same as above, soft to stiff.		20	K		50	0.4 to 1.7	NA	<1	
411.2			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-415 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.2 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 374213.2 E.(Y) 787214.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, medium stiff, wood pieces, roots.			L		83	0.6 to 0.8	NA	<1	
409.2			23							
408.2	**SILT (ML)**, same as interval at 2' to 4' bgs, but wet, medium stiff to very stiff. (Fill)		24	M		100	0.7 to 2.7	NA	<1	
407.2			25							
406.2	Same as above, medium stiff to stiff.		26	N		83	0.7 to 1.2	NA	<1	
405.2			27							
404.2	Same as above, soft to stiff.		28	O		46	0.3 to 1.7	NA	<1	
403.2			29							
402.2	**SILTY SAND (SM)**, fine sand, 30%-40% silt, non-plastic, mottled yellowish brown 10YR 5/6 and gray 10YR 6/1, no odor, moist to wet, loose to medium dense. (Native)		30	P		42	0.9 to 1.8	NA	<1	
401.2			31							
400.2			32	Q		100	0.5 to 2.1	NA	6	
	LEAN CLAY (CL), plastic, yellowish									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-415 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.2 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 374213.2 E (Y) 787214.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	brown 10YR 5/6 to gray 10YR 6/1, no odor, moist to wet, medium stiff to very stiff, laminated. (Lacustrine)									
398.2	Same as above, very soft to medium stiff, becomes more uniform in color and less laminated, but some laminae present. (Lacustrine)		34	R		100	0.2 to 0.8	NA	20	
397.2			35							
396.2	Same as above, stiff, laminae still present.		36	S		100	1.0 to 1.6	NA	56	Duplicate FDUP32/33-010-000916 collected.
395.2			37							
394.2	Same as above stiff to very stiff, some zones are gray 2.5Y 5/1.		38	T		100	1.0 to 2.5	NA	39	
393.2			39							
392.2	Same as above, stiff.		40	U		100	1.3 to 1.5	NA	8	
391.2			41							
390.2	Same as above, medium stiff to stiff.		42	V		100	0.6 to 1.8	NA	4	
389.2			43							
	LEAN CLAY (CL), 5%-10% fine to coarse sand, occasional pebbles, plastic,									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-415 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 432.2 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/16/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 374213.2 E.(Y) 787214.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	gray 2.5Y 5/1, no odor, wet, soft to stiff. (Till)			W		100	0.4 to 1.1	NA	<1	
387.2			45							
	Brown 10YR 5/3 zone at 45.9' to 47.3' bgs, contains coal.									
386.2			46	X		100	0.7 to 1.2	NA	<1	
385.2	Same as gray clay above, medium stiff to stiff.		47							
384.2	Same as above, medium stiff.		48	Y		100	0.5 to 0.9	NA	<1	
383.2			49							
382.2	Same as above, stiff.		50	Z		100	1.0 to 1.2	NA	<1	
381.2			51							
380.2	**End of Boring at 52 feet.**		52							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-416 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.2 Completion Depth 56.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 374287.1 E.(Y) 787243.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% fine to coarse sand, 5%-10% clay, trace gravel, non-plastic, brownish yellow 10YR 6/6, no odor, moist to dry, soft to hard. (Fill)		A		100	0.4 to 4.5	NA	<1	Grass at the surface.
430.2		1							
429.2	Same as above, but dark grayish brown 10YR 3/2, some red brick fragments, stiff to very stiff.	2	B		100	1.0 to 3.4	NA	<1	
428.2		3							
427.2	Same as above.	4	C		92	1.4 to 2.3	NA	<1	
426.2	**LEAN CLAY (CL)**, varying silt concentration (5%-40% silt), trace fine gravel, plastic to non-plastic, dark gray 2.5Y 4/1, no odor, moist, stiff to very stiff. (Fill)	5							
425.2	Same as above, piece of wood.	6	D		96	1.0 to 3.1	NA	<1	
424.2		7							
423.2	Same as above, soft to medium stiff.	8	E		17	0.4 to 0.7	NA	<1	
422.2		9							
421.2	Same as above.	10	F		33	0.4 to 0.7	NA	<1	
420.2		11							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-416 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.2 Completion Depth 56.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T 9 S R 2 E Date. Start 9/15/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 374287.1 E.(Y) 787243.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL: G - K. Baker; D - G. Swift; H - R. Hoin; H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, soft.		G		42	0.3 to 0.5	NA	<1	
418.2		13							
417.2	Same as above, color varies to a brownish yellow 10YR 6/6, very soft to soft.	14	H		46	<0.2 to 0.4	NA	<1	
416.2		15							
415.2	Same as above, varying dark gray and brownish yellow, soft.	16	I		38	0.4 to 0.5	NA	<1	
414.2		17							
413.2	Same as above, very soft to soft.	18	J		38	0.2 to 0.4	NA	<1	
412.2		19							
411.2	Same as above.	20	K		100	0.4 to 0.5	NA	<1	
410.2		21							
409.2	Same as above, medium stiff.	22	L		96	0.7	NA	<1	
408.2		23							
	SILT (ML), same as interval at 2' to 4' bgs, but wet and soft. (Fill)					0.2			

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-416 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.2 Completion Depth 56.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 374287.1 E.(Y) 787243.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL: G - K. Baker; D - G. Swift; H - R. Hoin; H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, soft to stiff.		M		96	0.2 to 1.5	NA	<1	
406.2		25							
405.2	**LEAN CLAY (CL)**, 5% fine sand, 10%-30% silt, plastic to non-plastic, mottled yellowish brown 10YR 5/6 and pale brown 10 YR 6/3, no odor, moist, very stiff. (Loess)	26	N		88	2.2 to 3.7	NA	<1	Trace very fine gravel in QC sample (clay).
404.2		27							
403.2	Same as above, stiff to very stiff, some gray 10YR 5/1.	28	O		100	1.5 to 2.8	NA	17	Trace very fine gravel in QC sample. Sample O/P is very mottled.
402.2		29							
401.2	Same as above.	30	P		100	1.4 to 2.4	NA	<1	
400.2		31							
399.2	**LEAN CLAY (CL)**, 5% fine sand, 10%-20% silt, laminae present, yellowish brown 10YR 5/6 and light brownish gray 10YR 6/2, no odor, moist, soft to medium stiff. (Lacustrine)	32	Q		100	0.4 to 0.6	NA	<1	
398.2		33							
397.2	Same as above, clay becomes more uniform in color and less laminated, brownish yellow 10YR 6/6, medium stiff to stiff.	34	R		100	0.6 to 1.4	NA	<1	
396.2		35							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-416 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.2 Completion Depth 56.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 374287.1 E (Y) 787243.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL: G - K. Baker; D - G. Swift; H - R. Hoin; H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff.			S		100	1.5 to 1.7	NA	6	
394.2			37							
393.2	LEAN CLAY (CL), 0%-10% silt, trace fine to coarse sand, occasional pebbles, plastic, yellowish brown 10YR 5/4, no odor, moist, stiff to hard. (Till)		38	T		83	1.5 to 4.5	NA	38	Duplicate FDUP32/33-008-000916 collected.
392.2			39							
391.2	Same as above, stiff.		40	U		100	1.4 to 1.8	NA	14	
390.2			41							
389.2	Same as above, medium stiff to very stiff.		42	V		100	0.8 to 2.2	NA	8	
388.2			43							
387.2	Same as above, but stiff.		44	W		100	1.2 to 2.0	NA	<1	
386.2			45							
385.2	Same as above, but gray 2.5Y 5/1, medium stiff to stiff.		46	X		100	0.7 to 1.0	NA	<1	
384.2			47							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-416 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.2 Completion Depth 56.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/15/00 Finish 9/16/00

UTM (or State Plane) Coord. N.(X) 374287.1 E.(Y) 787243.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, soft.			Y		100	0.2 to 0.4	NA	<1	
382.2			49							
381.2	Same as above.		50	Z		100	0.3	NA	<1	
380.2			51							
379.2	Same as above.		52	AA		100	0.2 to 0.4	NA	<1	
378.2			53							
377.2	Same as above.		54	BB		100	0.4	NA	<1	
376.2			55							
375.2	**End of Boring at 56 feet.**		56							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-417 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.0 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374131.0 E.(Y) 787337.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), little clay, trace fine sand, dark brown 10YR 3/3, no odor, dry. (Fill)			A		100	NR	NA	<2	
426.0			1							
425.0	Same as above.		2	B		100	NR	NA	<2	
424.0			3							
423.0	Same as above.		4	C		100	NR	NA	<2	
422.0			5							
421.0	Same as above.		6	D		100	NR	NA	<2	
420.0			7							
419.0	**LEAN CLAY (CL),** little silt, trace fine gravel, plastic, gray 10YR 5/1, no odor, moist, wood chips. (Fill)		8	E		100	3.0 2.0	NA	<2	
418.0	Same as above, but color to olive gray 5Y 4/2, moist, no odor, wood chips.		9							
417.0	Same as above, moist, no odor.		10	F		100	1.0	NA	<2	
416.0			11							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-417 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.0 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374131.0 E (Y) 787337.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hallemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, trace coarse gravel, some plastic fragments, moist, no odor.			G		100	1.0	NA	<2	
414.0			13							
413.0	Same as above, moist, no odor.		14	H		100	1.0	NA	<2	
412.0			15							
411.0			16	I		0	NR	NA	NR	No recovery, driller thinks he pushed a rock.
410.0			17							
409.0	Same as above, wood chips.		18	J		8	NR	NA	NR	
408.0			19							
407.0			20	K		100	1.5	NA	<2	
406.0	Same as above, but color change to brown and gray mottling at 20.5' bgs, moist, no odor.		21							
405.0	Same as above, roots.		22	L		100	1.0	NA	<2	
404.0			23							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-417 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.0 Completion Depth 44.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374131.0 E.(Y) 787337.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 20%-30% silt, trace fine sand, with brown and gray mottling, dark brown/black staining, coal fragments, moist, no odor. (Native)			M		100	2.5	NA	<2	
402.0			25							
401.0	Same as above, moist, no odor.		26	N		100	1.0	NA	<2	
400.0			27							
399.0	Clay as above, but some sand.		28	O		100	2.0	NA	<2	
398.0			29							
							1.0 1.5			
397.0	**SILTY SAND (SM),** little gravel, occasional coal fragments, dark brown 10YR 5/2, moist to wet, no odor.		30	P		100	NA	NA	<2	
396.0			31							
395.0	Same as above, wet, no odor.		32	Q		100	NA	NA	<2	
394.0			33							
	3" clay seam at 33.5' bgs.									
393.0	Same as above, wet, no odor.		34	R		100	NA	NA	<2	
392.0			35							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-417 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 427.0 Completion Depth 44.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374131.0 E.(Y) 787337.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Halemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), trace gravel, plastic, light olive brown 2.5Y 5/4, moist, no odor. (Till) 1/8" sand seam at 36.5' bgs.			S		100	1.5	NA	<2	QC sample S/T has no gravel, and 25% to 35% silt; maybe faintly laminated, but may also be uppermost portion of till. QC sample U/V has gravel and no hint of laminae.
390.0			37							
	Vertical fracture at 37.5' bgs.									
389.0			38	T		100	1.5	NA	<2	
388.0			39							
387.0	Same as above, moist, no odor.		40	U		100	2.0	NA	<2	
386.0			41							
385.0	Same as above, moist, no odor.		42	V		100	2.0	NA	<2	
384.0			43							
383.0	**End of Boring at 44 feet.**		44							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-418 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.4 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374158.6 E.(Y) 787245.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 10%-15% clay, non-plastic, brown 10YR 5/3, dry, stiff to very stiff, but flakey. (Fill)			A		100	1.5 to 2.3	NA	<1	
430.4			1							
429.4	Same as above, but very dark grayish brown 10YR 3/2, with trace gravel below 1.5' bgs.		2	B		100	1.0 to 4.5	NA	<1	
428.4			3							
	30-40% clay between 3.5' to 4.0' bgs, very hard.									
427.4	Same as above, but 10%-15% clay, flakey, stiff.		4	C		100	1.0	NA	<1	
426.4			5							
425.4	Increasing clay with depth.		6	D		100	0.5 to 2.0	NA	<1	
424.4	**LEAN CLAY (CL)**, 20%-30% silt, trace medium gravel, low to medium plasticity, dark grayish brown 2.5Y 4/2, slightly moist, moderately stiff to stiff. (Fill)		7							
423.4	Same as above, coarse gravel and organic material (wood) at 8.5' to 8.7' bgs, stiff.		8	E		83	1.0 to 1.5	NA	<1	
422.4			9							
421.4	Same as above, but color ranges between gray 5Y 5/1 and dark gray 2.5Y 4/1, trace gravel.		10	F		83	1.5	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-418 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.4 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374158.6 E (Y) 787245.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
419.4	Same as above, color ranges between olive gray 5Y 4/2 and dark gray 5Y 4/1, medium stiff.		12	G		79	0.5 to 0.75	NA	<1	
418.4			13							
417.4	Same as above, with some black staining (5%-10%), medium stiff to stiff.		14	H		79	0.5 to 1.0	NA	<1	
416.4			15							
415.4	Same as above, some organic material at 16.5' to 16.6' bgs.		16	I		83	0.5 to 1.0	NA	<1	
414.4			17							
413.4	Same as above.		18	J		83	0.5 to 1.0	NA	<1	
412.4			19							
411.4	Same as above.		20	K		88	0.5 to 1.25	NA	<1	
410.4			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-418 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.4 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374158.6 E.(Y) 787245.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but light yellowish brown 10YR 6/4 to yellowish brown 10YR 3/4, with 20%-40% black staining.			L		88	1.0 to 1.75	NA	<1	
408.4			23							
407.4	**LEAN CLAY (CL)**, 10%-25% silt, trace fine sand, low to medium plasticity, yellowish brown 10YR 5/6 with gray mottling (20%-40%), trace black staining, slightly moist, stiff to very stiff. (Native)		24	M		100	1.0 to 2.25	NA	4	Trace very fine gravel in QC samples M thru P, samples look like native soil.
406.4			25							
405.4	Same as above, but 5%-10% black staining.		26	N		100	1.5 to 2.5	NA	8	
404.4			27							
403.4	Same as above, low plasticity, 25%-35% silt, 50%-70% mottling, stiff to very stiff.		28	O		100	2.0 to 3.0	NA	14	
402.4			29							
401.4	Same as above, 10%-25% silt, medium plasticity, stiff.		30	P		100	1.5 to 2.0	NA	5	
400.4			31							
399.4	Same as above, but 10%-15% sand, 10%-30% mottled, medium stiff to stiff.		32	Q		83	0.75 to 1.5	NA	12	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-418 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.4 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord N.(X) 374158.6 E (Y) 787245.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
397.4			34	R		83	1.0	NA	32	
396.4	CLAYEY SAND (SC), fine to medium sand, 15%-25% clay, trace gravel, 10%-15% silt, yellowish brown 10YR 5/6, wet, low density, decreasing clay and silt with depth, high PID hit in sand.		35							
395.4	SILTY SAND (SM), 30%-40% fines, trace fine to coarse gravel, 2.5Y 5/4 light olive brown, wet, loose to medium dense.		36	S		100	NA	NA	9	
394.4			37							
393.4	Same as above.		38	T		100	NA	NA	21	
392.4			39							
391.4	Same as above, but 15%-25% silt, light olive brown 2.5Y 5/4, wet, loose, increasing clay with depth (up to 15%-20% at 42' to 43' bgs.)		40	U		100	NA	NA	11	
390.4			41							
389.4			42	V		100	NA	NA	13	
388.4	LEAN CLAY (CL), 15%-25% silt, trace gravel, plastic, dark gray 5Y 4/1, uniform texture and color, slightly moist, stiff. (Till)		43				1.5			

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-418 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.4 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374158.6 E.(Y) 787245.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but 5%-10% silt.			W		100	1.0	NA	<1	
386.4			45							
385.4	Same as above, 20%-30% silt between 46' to 47' bgs, low plasticity. 5%-10% silt below 47' bgs, plastic.		46	X		100	1.0 to 1.5	NA	<1	
384.4			47							
383.4	Same as above, but trace silt, very plastic, very soft.		48	Y		100	<0.5	NA	<1	
382.4			49							
381.4	Same as above.		50	Z		100	<0.5	NA	<1	
380.4			51							
379.4	**End of Boring at 52 feet.**		52							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-419 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.9 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 374103.7 E.(Y) 787149.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Blind Drilled from 0' to 8' bgs.									
429.9			1							
428.9			2							
427.9			3							
426.9			4							
425.9			5							
424.9			6							
423.9			7							
422.9	**SILT (ML)**, little clay, dark brown 10YR 3/3, dry, no odor, brick fragments. (Fill)		8	E		100	NR	NA	<2	
421.9			9							
420.9	Same as above.		10	F		100	2.5	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-419 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.9 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T 9 S R 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 374103.7 E.(Y) 787149.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), plastic, gray 2.5Y 5/1, moist, no odor. (Fill)									
418.9	Same as above, but some silt, no odor, glass fragments.		12	G		100	2.0	NA	<2	
417.9			13							
416.9	Same as clay above, but some silt, no odor, glass fragments.		14	H		100	1.5	NA	<2	
415.9			15							
414.9	Same as clay above, wood fragments.		16	I		100	1.5	NA	<2	
413.9			17							
412.9	**LEAN CLAY (CL)**, 10%-30% silt, trace fine sand, color to brownish yellow. (Native)		18	J		100	3.0	NA	<2	
411.9			19							
410.9	Same as above, with gray mottling, dry, no odor.		20	K		100	2.0	NA	<2	
409.9			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-419 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.9 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 374103.7 E.(Y) 787149.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, dry, no odor.			L		100	3.0	NA	<2	
407.9			23							
406.9	Same as above, moist, no odor, trace sand.		24	M		100	2.0	NA	<2	
405.9	Some silt 25' to 26' bgs.		25							
404.9	Same as above, moist, no odor.		26	N		100	2.0	NA	<2	
403.9			27							
402.9	**SANDY CLAY (CL)**, plastic, brown and gray mottling, moist, no odor.		28	O		100	2.0	NA	<2	
401.9			29							
400.9	Same as above, no odor.		30	P		100	1.0	NA	<2	
399.9			31							
398.9	2" sand seam at 32' bgs, wet, no odor.		32	Q		100	1.0	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-419 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.9 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T 9 S R 2 E Date Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord N.(X) 374103.7 E.(Y) 787149.0

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
396.9	LEAN CLAY (CL), 20%-25% silt, trace fine sand, trace fine gravel, plastic, brown and gray mottling, to light olive brown 2.5Y 5/4, no odor. (Till)		34	R		100	1.5	NA	<2	
395.9			35							
394.9	Same as above, no odor, little sand, coal fragment.		36	S		100	2.5	NA	<2	
393.9			37							
	3" sand seam at 37.5' bgs.									
392.9	Same as above.		38	T		100	3.0	NA	<2	
391.9	Same as above, trace gravel, plastic, light olive brown 2.5Y 5/4, no odor, moist, coal fragments.		39							
390.9	Same as above, moist, no odor.		40	U		100	1.5	NA	<2	
389.9			41							
388.9	Same as above, moist, no odor.		42	V		100	1.5	NA	<2	
387.9			43							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-419 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.9 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 374103.7 E.(Y) 787149.0

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, moist, no odor.			W		100	1.0	NA	<2	
385.9			45							
384.9	Same as above, moist, no odor.		46	X		100	1.0	NA	<2	
383.9			47							
	1/2" sand seam at 47.5' bgs.									
382.9			48	Y		100	1.5	NA	<2	
381.9			49							
380.9	Same as clay above, moist, no odor.		50	Z		100	1.0	NA	<2	
379.9			51							
378.9	**End of Boring at 52 feet.**		52							

(950226)

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-420 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.6 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/2/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 374418.5 E.(Y) 787155.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% clay, non-plastic, yellowish brown 10YR 5/6, dry, hard. (Fill)			A		100	4.0 to 4.5	NA	<1	
429.6			1							
428.6	Same as above, but very dark grayish brown 10YR 3/2, with trace gravel, flakey.		2	B		100	NA	NA	<1	
427.6			3							
426.6	Same as above, increasing clay with depth.		4	C		100	3.5	NA	<1	
425.6	**LEAN CLAY (CL)**, 20%-30% silt, trace fine sand, trace gravel, low plasticity, dark grayish brown 2.5Y 4/2, dry, very stiff. (Fill)		5							
424.6	Same as above, but slightly moist, stiff.		6	D		100	1.0 to 1.5	NA	<1	
423.6			7							
422.6	Same as above, but 30%-40% silt, no gravel.		8	E		83	1.5 to 1.75	NA	<1	
421.6			9							
420.6	Same as above.		10	F		83	1.0 to 1.5	NA	<1	

Illinois Environmental Protection Agency — Field Boring Log

Site File No.		County	Williamson	Boring No.	SB-420
Monitor Well No					
Site File Name	Crab Orchard National Wildlife Refuge	Surface Elevation	430.6	Completion Depth	48.0
Fed. ID No.		Auger Depth		Rotary Depth	
Quadrangle	SW 1/4 of NW 1/4	Sec. 32	T. 9 S	R 2 E	Date: Start 10/2/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 374418.5 E (Y) 787155.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location: Area 9 Repository

Drilling Equipment: Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
418.6	Same as above, but 10%-20% silt, trace gravel, low to medium plasticity, moist, some black staining.		12	G		83	1.0 to 1.5	NA	<1	
417.6			13							
416.6	Same as above, but with pieces of wood/charcoal (black).		14	H		83	1.0 to 1.5	NA	<1	
415.6			15							
414.6	Same as above, but medium plasticity, pieces of red brick and wood, medium stiff to stiff.		16	I		71	0.5 to 1.0	NA	<1	
413.6			17							
412.6			18	J		71	1.0 to 1.25	NA	<1	
411.6	LEAN CLAY (CL), 10%-20% silt, trace fine sand, plastic, mottled 10%-20%, yellowish brown 10YR 5/4, moist, stiff. (Native)		19							
410.6	Same as above, but 30%-40% silt, low plasticity, dark yellowish brown 10YR 4/4, medium stiff to stiff, no mottling.		20	K		100	0.5 to 1.0	NA	<1	
409.6			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-420 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.6 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/2/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 374418.5 E.(Y) 787155.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but 10%-20% silt, medium plasticity, stiff.			L		100	1.0 to 2.0	NA	<1	
407.6			23							
	30%-40% silt between 23.5' to 24' bgs.									
406.6	Same as above, 20%-30% silt, low to medium plasticity.		24	M		96	1.5 to 2.0	NA	<1	
405.6			25							
404.6	Same as above, 10%-15% silt, plastic, with 10%-15% black staining and 15%-20% gray mottling, color change to yellowish brown 10YR 5/4, very stiff below 27' bgs.		26	N		96	1.5 to 2.5	NA	<1	
403.6			27							
402.6	Same as above, 5% black staining, stiff to very stiff.		28	O		96	2.0 to 2.5	NA	<1	
401.6			29							
400.6	Same as above, trace black staining, very stiff.		30	P		96	2.5 to 4.0	NA	<1	
399.6			31							
398.6	Same as above, medium stiff, decreasing stiffness to soft between 33' to 34' bgs.		32	Q		100	0.5	NA	18	Includes sample volume for MS/MSD. QC sample Q/R looks like lacustrine deposit, but no laminae are present (less

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-420 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.6 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date. Start 10/2/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 374418.5 E.(Y) 787155.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
										mottled, higher silt content, and softer)
396.6	Same as above, medium stiff to stiff, light olive brown 2.5Y 5/4, very plastic.		34	R		100	0.5 to 1.25	NA	14	
395.6			35							
394.6	Same as above, plastic, stiff.		36	S		100	2.0	NA	15	
393.6			37							
392.6			38	T		100	1.0 to 4.0	NA	3	
391.6	LEAN CLAY (CL), trace silt, medium plasticity, light olive brown 2.5Y 5/4, slightly moist, hard below 39' bgs, some fractures between 39' and 40' bgs. (Till)		39							
390.6	Same as above, olive brown 5Y 5/2, slightly moist, stiff, no fractures.		40	U		100	1.0	NA	<1	
389.6			41							
388.6	Same as above, but stiff, color changes to dark gray 5Y 4/1 below 43.7' bgs.		42	V		100	1.0 to 1.5	NA	<1	
387.6			43							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-420 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.6 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/2/00 Finish 10/2/00

UTM (or State Plane) Coord. N.(X) 374418.5 E.(Y) 787155.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, trace gravel, medium stiff.			W		100	0.5 to 0.75	NA	<1	
385.6			45							
384.6	Same as above.		46	X		100	0.5 to 1.0	NA	<1	
383.6			47							
382.6	**End of Boring at 48 feet.**		48							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-421 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.4 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374191.4 E.(Y) 787102.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), trace fine gravel, trace sand, non-plastic, brownish yellow 10YR 6/8, dry, no odor. (Fill)			A		100	NR	NA	<2	
429.4			1							
428.4	Same as above, dry, no odor.		2	B		100	NR	NA	<2	
427.4			3							
426.4	**LEAN CLAY (CL)**, 20%-30% silt, trace gravel, trace fine sand, olive gray. (Fill)		4	C		100	1.0	NA	<2	
425.4			5							
424.4	Same as above.		6	D		100	1.0	NA	<2	
423.4	color change to dark brown at 7' bgs.		7							
422.4	Same as above, dry, no odor, trace sand.		8	E		100	4.0	NA	<2	
421.4			9							
420.4	Same as above, dry, no odor, brick pieces.		10	F		100	3.5	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-421 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.4 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec 32 T 9 S R 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374191.4 E.(Y) 787102.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
418.4	SILT (ML), dark brown 10YR 3/3, dry, no odor, brick pieces.		12	G		100	NR	NA	<2	
417.4			13							
416.4	Same as above, dry, no odor, brick pieces.		14	H		100	NR	NA	<2	
415.4			15							
414.4	Same as above, moist, no odor.		16	I		100	NR	NA	<2	
413.4			17							
	6" clay at 17.5' bgs.									
412.4	Same as silt above, dry, no odor.		18	J		100	NR	NA	<2	
411.4			19							
410.4	LEAN CLAY (CL), 20%-30% silt, trace fine sand, plastic, brownish yellow 10YR 6/8, mottled, little dark brown/black staining, moist, no odor.		20	K		100	4.0	NA	<2	Duplicate FDUP32/33-035-001003 collected.
409.4			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-421 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.4 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374191.4 E.(Y) 787102.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	4.0	NA	<2	
407.4			23							
406.4	Same as above, occasional vertical to subvertical fractures.		24	M		100	4.0	NA	<2	
405.4			25							
404.4	Coal chunks. Same as above.		26	N		100	4.0	NA	<2	
403.4	Gray and brown mottling at 27' to 28' bgs.		27							
402.4	**SANDY SILT (ML)**, 30%-40% sand, trace clay, moist, no odor.		28	O		100	1.0	NA	<2	
401.4			29							
400.4	Same as above.		30	P		100	1.0	NA	<2	
399.4			31							
398.4	**LEAN CLAY (CL)**, 30%-40% silt, trace fine sand. 6" sand at 32' bgs.		32	Q		100	1.5	NA	<2	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No: | County: Williamson | Boring No: SB-421 | Monitor Well No.:

Site File Name: Crab Orchard National Wildlife Refuge | Surface Elevation: 430.4 | Completion Depth: 48.0

Fed. ID. No.: | Auger Depth: | Rotary Depth:

Quadrangle: SW 1/4 of NW 1/4 | Sec. 32 | T 9 S | R 2 E | Date Start: 10/3/00 | Finish: 10/3/00

UTM (or State Plane) Coord. N.(X): 374191.4 | E (Y): 787102.8

Latitude: ° ' " | Longitude: ° ' "

Boring Location: Area 9 Repository

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL

G - R. Hallemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
396.4	Same as above, moist, no odor.		34	R		100	1.0	NA	<2	
395.4			35							
394.4	LEAN CLAY (CL), 15%-25% silt, trace fine sand, trace gravel, plastic, gray 10YR 5/1, uniform color and texture, moist, no odor. (Till)		36	S		100	0.5	NA	<2	
393.4			37							
392.4	Same as above.		38	T		100	0.5	NA	<2	
391.4			39							
390.4	12" sand seam between 40' and 41' bgs, wet, no odor.		40	U		100	0.5	NA	<2	
389.4			41							
388.4	Same as clay till above, very plastic.		42	V		100	0.5	NA	<2	
387.4			43							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-421 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.4 Completion Depth 48.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/3/00

UTM (or State Plane) Coord. N.(X) 374191.4 E.(Y) 787102.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, moist, no odor.			W		100	0.5	NA	<2	
385.4			45							
384.4	Same as above, moist, no odor.		46	X		100	0.5	NA	<2	
383.4			47							
382.4	**End of Boring at 48 feet.**		48							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-422 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.2 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 374368.3 E.(Y) 787035.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman/R. Hafemeister
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 20%-30% clay, non-plastic, yellowish brown 10YR 5/4, dry, very stiff. (Fill)		A		100	3.0 to 3.5	NA	<1	Grass at the surface.
430.2	**SILTY SAND (SM)**, 10%-15% gravel, very dark grayish brown 10YR 3/2, dry, loose. (Fill)	1							
429.2	**CLAY (CL)**, 30%-40% silt, trace gravel, low plasticity, brown 10YR 5/3, slightly moist, very stiff. (Fill)	2	B		100	2.5 to 3.0	NA	<1	
428.2		3							
427.2	Same as above, but olive brown 2.5Y 4/3, stiff.	4	C		100	2.0	NA	<1	
426.2		5							
425.2	Organic material at 6' to 6.3' bgs.	6	D		100	3.25 to 3.75	NA	<1	
	Same as above, but gray 5Y 5/1, with some olive brown 2.5Y 4/3, very stiff.								
424.2		7							
	Very dark gray 10YR 3/1 between 7.5' to 8.0' bgs.								
423.2	Same as above, but interspersed with silty sand as at 1' to 2' bgs, with some pieces of grass/wood, stiff.	8	E		100	1.0 to 2.0	NA	<1	
422.2		9							
421.2	Same as above.	10	F		100	1.0 to 2.5	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-422 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.2 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date Start 10/3/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 374368.3 E (Y) 787035.6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman/R. Hafemeister
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
419.2	**SILTY SAND (SM)**, as at 1' to 2' bgs. (Fill)		12	G		100	NA	NA	<1	
418.2	**LEAN CLAY (CL)**, as at 8' to 12' bgs. (Fill)		13							
417.2			14	H		50	1.0	NA	<1	
416.2	Refusal at 15' bgs, moved 2 feet away and continued.		15				1.0			
415.2	**SILT (ML)**, dark brown 10YR 3/3, dry, no odor. (Fill)		16	I		100	NR	NA	<1	
414.2			17							
413.2	Same as above.		18	J		50	NR	NA	<1	
412.2			19							
411.2	**LEAN CLAY (CL)**, 20%-30% silt, trace fine sand, trace very fine gravel, plastic, brownish yellow 10YR 6/8, little black/dark brown staining, moist, no odor. (Native)		20	K		100	NR	NA	<1	
410.2			21							

(9502286)

400

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-422 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.2 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 374368.3 E.(Y) 787035.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL
G - T. Silverman/R. Hafemeister
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	NR	NA	<1	
408.2			23							
407.2	Same as above, moist, no odor, vertical gray streaks. (Native)		24	M		100	2.0	NA	<1	
406.2			25							
405.2	Same as above, moist, no odor, brown and gray mottling, little sand at 27' to 27.3' bgs.		26	N		100	3.5	NA	<1	
404.2			27							
403.2	Same as above, moist, no odor, little silt, varves at 28' to 29' bgs.		28	O		100	1.5	NA	3	
402.2			29							
401.2	Same as above, moist, no odor, less silt.		30	P		100	2.0	NA	15	Duplicate FDUP32/33-037-001004 collected.
400.2			31							
399.2	Same as above, some silt, varves at 32' to 35' bgs.		32	Q		100	3	NA	3	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-422 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.2 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T 9 S R 2 E Date: Start 10/3/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 374368.3 E (Y) 787035.6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman/R. Hafemeister
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
397.2	Same as above, some silt.		34	R		100	1.5	NA	15	
396.2			35							
395.2	Same as above, vertical fractures throughout, varves (indistinct).		36	S		100	2.0	NA	<1	
394.2			37							
393.2	Same as above, moist, no odor.		38	T		100	2.0	NA	3	
392.2			39							
391.2	**LEAN CLAY (CL), 10%-20% silt, trace fine sand, trace gravel, color to gray 10YR 5/1, uniform color and texture, moist, no odor. (Till)**		40	U		100	0.5	NA	<1	
390.2			41							
389.2	2" sand and gravel seam at 42' bgs.		42	V		100	1.0	NA	<1	
388.2	Same as above, moist, no odor.		43							

(950228)

402

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-422 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 431.2 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/3/00 Finish 10/4/00

UTM (or State Plane) Coord. N.(X) 374368.3 E.(Y) 787035.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 55DT Truck

PERSONNEL

G - T. Silverman/R. Hafemeister
D - D. Powney
H - R. Williams
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, moist, no odor.			W		100	2.5	NA	<1	
386.2			45							
	Vertical fracture at 45.5' to 46.5' bgs.									
385.2	Same as above, moist, no odor.		46	X		100	1.5	NA	<1	
384.2			47							
383.2	Same as above, moist, no odor.		48	Y		100	0.5	NA	<1	
382.2			49							
381.2	Same as above, moist, no odor.		50	Z		100	1.0	NA	<1	
380.2			51							
379.2	**End of Boring at 52 feet.**		52							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-423 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.4 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 374425.6 E.(Y) 786945.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	TOPSOIL,3".			A		100	4.0	NA	<2	
	SILT (ML), brownish yellow 10YR 6/6, no odor, dry, hard. (Fill)									
429.4			1							
	8" brown organic soil at 1.5' bgs, dry, no odor.									
428.4			2	B		100	2.5	NA	<2	
427.4	**LEAN CLAY (CL)**, trace gravel, plastic, gray 10YR 5/1, moist, no odor. (Fill)		3							
426.4	Same as above, moist, no odor.		4	C		100	1.0	NA	<2	
425.4			5							
424.4	Same as above, moist, no odor.		6	D		100	1.5	NA	<2	
423.4			7							
422.4	Same as above, moist, no odor, medium gravel		8	E		100	1.0	NA	<2	
421.4	6" rock zone at 9' to 9.5' bgs.		9							
420.4	Same as above, moist, no odor.		10	F		100	1.0	NA	<2	

(950226)

405

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-423 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.4 Completion Depth 52.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 374425.6 E (Y) 786945.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hallemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
418.4	Same as above, no odor, moist.	12	G		100	3.0	NA	<2	
417.4	12" brown silt at 13' to 14' bgs, dry, no odor.	13							
416.4	Same as clay above, no odor, moist, hard.	14	H		100	4.5	NA	<2	
415.4	12" brown silt at 15' to 16' bgs, dry, no odor.	15							
414.4	SILT (ML), trace clay, trace gravel, dark grayish brown 10YR 3/2, dry, no odor. (Fill)	16	I		100	NR	NA	<2	
413.4		17							
412.4	Same as silt above, brick fragments.	18	J		100	NR	NA	106	
411.4		19							
410.4	LEAN CLAY (CL), little clay, trace fine sand, plastic, brownish yellow 10YR 6/6, no odor, moist. (Loess)	20	K		100	3.0	NA	471	Duplicate FDUP32/33-032-001 001 collected (for ECCS). Duplicate FDUP32/33-033-001 001 collected (for STL).
	Same as above, coal chips.								
409.4		21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-423 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.4 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 374425.6 E.(Y) 786945.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			L		100	3.0	NA	181	
407.4			23							
406.4	Same as above, moist, no odor, less silt.		24	M		100	2.5	NA	72	
405.4	Little silt at 25' to 25.5' bgs.		25							
404.4	Same as above, moist, no odor, with gray and brownish yellow mottling.		26	N		100	3.0	NA	106	
403.4			27							
402.4	Same as above, moist, plastic, cement-like odor.		28	O		100	2.75	NA	80	
401.4			29							
400.4	Same as above, moist, plastic, cement-like odor.		30	P		100	2.25	NA	80	
399.4			31							
398.4	**LEAN CLAY (CL)**, as above, 30% silt, more uniform color, very faint laminae. (Lacustrine)		32	Q		100	3.0	NA	25	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-423 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.4 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 374425.6 E (Y) 786945.3

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
396.4	Same as above, some silt at 34.5' to 35' bgs.		34	R		100	0.5	NA	10	
395.4	Varves at 35' to 35.5' bgs, with silt.		35							
394.4	Same as clay above.		36	S		100	1.0 to 1.5	NA	7	
393.4	LEAN CLAY (CL), trace gravel, plastic, brown and gray mottling, vertical to subvertical fractures, moist, no odor. (Till)		37							
392.4	Same as above, no odor.		38	T		100	2.0 to 2.5	NA	5	
391.4			39							
390.4	Same as above, no odor, color change to light olive brown 2.5Y 5/6, no noticable fractures, more uniform color and texture.		40	U		100	2.0	NA	<2	
389.4			41							
388.4	Same as above, no odor.		42	V		100	1.75	NA	5	
387.4			43							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-423 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 430.4 Completion Depth 52.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle SW 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 374425.6 E.(Y) 786945.3

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Area 9 Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, but little sand.			W		100	2.0 to 2.5	NA	<2	
385.4	3" sand seam at 45 feet, dry.		45							
384.4	Same as above, little sand.		46	X		100	2.5	NA	<2	
383.4	Color change to gray 10YR 5/1 at 47 feet.		47							
382.4	Same as above, moist, no odor.		48	Y		100	1.0	NA	<2	
381.4			49							
380.4	Same as above, moist, no odor.		50	Z		100	1.0	NA	<2	
379.4			51							
378.4	**End of Boring at 52 feet.**		52							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-500 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.3 Completion Depth 32.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373817.5 E.(Y) 787269.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 30%-40% silt, trace fine sand, plastic, gray and brown mottling, moist, no odor.			A		100	2.0	NA	<2	
410.3			1							
409.3	Same as above, no odor.		2	B		100	2.5	NA	<2	
408.3			3							
407.3	Same as above.		4	C		100	1.0	NA	<2	
406.3			5							
405.3	Same as above.		6	D		100	2.0	NA	<2	
404.3			7							
403.3	Same as above, 20%-30% silt.		8	E		100	3.0	NA	<2	
402.3			9							
401.3	Same as above.		10	F		100	2.0	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-500 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.3 Completion Depth 32.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R 2 E Date Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373817.5 E (Y) 787269.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hallemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
399.3	Same as above, black/dark brown staining, moist, no odor.		12	G		100	2.0	NA	<2	
398.3			13							
397.3	Same as above, moist, no odor.		14	H		100	2.5	NA	<2	
396.3			15							
395.3	Same as above, but little silt and sand.		16	I		100	2.5	NA	<2	
394.3			17							
393.3			18	J		100	NR	NA	<2	
392.3	**SILTY SAND (SM)**, gray 10YR 5/1, wet, loose, no odor.		19							
391.3			20	K		100	NA	NA	<2	
390.3	**LEAN CLAY (CL)**, 10%-20% silt, trace fine sand, trace gravel, plastic, gray 10YR 5/1, uniform color and texture, dry, no odor. (Till)		21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-500 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.3 Completion Depth 32.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373817.5 E.(Y) 787269.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				L		100	3.0	NA	<2	
388.3			23							
387.3	Same as above, very plastic.		24	M		100	3.0	NA	<2	
386.3			25							
385.3	Same as above.		26	N		100	2.0	NA	<2	
384.3			27							
383.3	Same as above.		28	O		100	3.0	NA	<2	Duplicate FDUP32/33-031-001001 collected.
382.3			29							
381.3	Same as above.		30	P		100	3.0	NA	<2	
380.3			31							
379.3	**End of Boring at 32 feet.**		32							

(950226)

4/3

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-502 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.0 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373604.2 E.(Y) 787170.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% clay, trace fine sand, non-plastic, light yellowish brown 10YR 6/4, no odor, moist to dry, very stiff to hard.			A		100	2.5 to 4.5	NA	<1	
414.0			1							
413.0	Same as above, moist.		2	B		100	1.5 to 4.5	NA	<1	
412.0			3							
411.0	Same as above, grades downward to a clay.		4	C		100	2.7 to 3.5	NA	<1	
410.0	**LEAN CLAY (CL),** 5%-30% silt, mottled brownish yellow 10YR 6/6 and light brownish yellow 10YR 6/2, very stiff. (Loess)		5							
409.0	Same as above.		6	D		100	2.5 to 4.0	NA	<1	
408.0			7							
407.0	Same as above.		8	E		100	2.1 to 2.5	NA	<1	
406.0			9							
405.0	Same as above, but small (cm scale) zones of very dark gray 10YR 3/1.		10	F		100	2.5 to 3.8	NA	<1	

(950226)

415

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-502 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.0 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373604.2 E (Y) 787170.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
403.0	Same as above, dark brown/black staining, very stiff.		12	G		100	2.5 to 2.7	NA	<1	
402.0			13							
401.0	Same as above, stiff.		14	H		100	1.1 to 1.0	NA	<1	
400.0			15							
399.0	Same as above, no staining, medium stiff to stiff.		16	I		100	0.7 to 1.9	NA	<1	
398.0			17							
397.0	Same as above, stiff to very stiff.		18	J		100	1.7 to 3.0	NA	<1	
396.0			19							
395.0	Same as above, stiff.		20	K		67	1.8 to 2.0	NA	<1	
394.0			21							

(950226)

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-502 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.0 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373604.2 E.(Y) 787170.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, increasing silt.			L		63	0.2 to 0.7	NA	<1	
392.0	**SANDY SILT (ML),** 30%-50% fine sand, 5%-10% clay, non-plastic, light brownish gray 2.5Y 6/2, no odor, wet, very soft to soft. (Lacustrine)		23							
391.0	Same as above, very soft.		24	M		54	0.2 to 0.4	NA	<1	
390.0	**SILTY SAND (SM),** fine sand, 15%-20% silt, non-plastic, light yellowish brown 10YR 6/3, no odor, wet, loose. (Lacustrine)		25							
389.0	Same as above.		26	N		58	<0.2	NA	<1	
388.0			27							
387.0	**LEAN CLAY (CL),** 10%-50% silt, 10%-20% fine sand, wet. (Lacustrine)		28	O		100	0.5	NA	<1	
386.0	**POORLY GRADED SAND (SP),** 5% silt, non-plastic, light brownish gray 10YR 6/3, no odor, wet, very loose, some laminae present. (Lacustrine)		29				0.3			
385.0	Same as above.		30	P		100	0.3	NA	<1	
384.0			31							
383.0			32	Q		100	0.2 to 0.5	NA	<1	
	LEAN CLAY (CL), 5%-10% silt, trace fine to coarse sand, occasional pebbles, plastic, gray 2.5Y 5/1, uniform color and									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-502 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.0 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373604.2 E (Y) 787170.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	texture, no odor, wet, soft. (Till)									
381.0	Same as above.		34	R		100	0.2 to 0.5	NA	<1	
380.0			35							
379.0	End of Boring at 36 feet.		36							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-503 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.4 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373742.3 E.(Y) 787191.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 10%-30% silt, trace fine sand, plastic to non-plastic, gray 10YR 5/1 and some brownish yellow 10YR 6/6, no odor, moist, stiff to very stiff.			A		96	1.7 to 3.0	NA	<1	Grass at the surface.
410.4			1							
409.4	Same as above, soft to very stiff.		2	B		92	0.3 to 3.1	NA	<1	
408.4			3							
407.4	Same as above, stiff.		4	C		100	1.0 to 1.7	NA	<1	
406.4			5							
405.4	Same as above, mottled brownish yellow 10YR 6/6 and light brownish yellow 10YR 6/2, some cm scale zones of dark grayish brown 10YR 4/2, plastic to non-plastic, no odor, wet, stiff to very stiff. (Loess)		6	D		100	1.2 to 2.8	NA	<1	Duplicate FDUP32/33-019-000920 collected.
404.4			7							
403.4	Same as above, very stiff.		8	E		100	2.0 to 2.3	NA	<1	
402.4			9							
401.4	Same as above, little black staining, very soft to stiff, silty sand zone at 10.2' to 10.4' bgs.		10	F		100	0.2 to 1.2	NA	<1	

(950226)

Illinois Environmental Protection Agency **Field Boring Log** Page 2 of 4

Site File No. _____ County Williamson Boring No SB-503 Monitor Well No _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.4 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373742.3 E (Y) 787191.6

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
399.4	Same as above, soft to stiff.		12	G		100	0.2 to 1.2	NA	<1	
398.4			13							
397.4	Same as above, medium stiff to stiff.		14	H		100	0.7 to 1.2	NA	<1	
396.4			15							
395.4	POORLY GRADED SAND (SP), fine to medium sand, non-plastic, yellowish brown 10YR 5/6, no odor, wet, loose.		16	I		38	0.2 to 0.3	NA	<1	
394.4			17							
393.4	Same as above.		18	J		33	0.2 to 0.3	NA	<1	
392.4			19							
391.4	LEAN CLAY (CL), 5%-10% silt, plastic, zones of both light olive brown 2.5Y 5/3 and gray 2.5Y 5/1, no odor, wet, stiff, some laminae present. (Lacustrine)		20	K		100	1.5 to 1.8	NA	<1	
390.4			21							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-503 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.4 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373742.3 E.(Y) 787191.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, stiff to very stiff.			L		100	1.5 to 3.6	NA	<1	
388.4			23							
387.4	Same as above, stiff to very stiff.		24	M		100	1.2 to 2.7	NA	<1	
386.4			25							
385.4	Same as above, stiff.		26	N		100	1.5 to 1.8	NA	<1	
384.4			27							
383.4	**LEAN CLAY (CL)**, 5%-10% silt, trace fine to coarse sand, occasional pebbles, plastic, gray 2.5Y5/1, no odor, wet, stiff. (Till)		28	O		100	0.8	NA	<1	No recovery on first try. Moved 4' north to collect sample.
382.4			29							
381.4	Same as above, soft to medium stiff.		30	P		100	0.5 to 0.8	NA	<1	
380.4			31							
379.4	Same as above, soft to stiff.		32	Q		100	0.5 to 1.2	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-503 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.4 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373742.3 E.(Y) 787191.6

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
377.4	Same as above, very stiff to hard.		34	R		100	2.0 to 4.5	NA	<1	
376.4			35							
375.4	End of Boring at 36 feet.		36							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-504 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.0 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373596.3 E.(Y) 787225.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 5%-10% clay, trace fine sand, non-plastic, light yellowish brown 10YR 6/4, no odor, moist to dry, very stiff to stiff.			A		100	2.5 to 4.0	NA	<1	
414.0			1							
413.0	Same as above.		2	B		100	2.0 to 3.4	NA	14	Duplicate FDUP32/33-018-000920 collected.
412.0			3							
411.0	Same as above, very stiff, grades downward to clay.		4	C		100	3.1 to 3.7	NA	<1	
410.0	**LEAN CLAY (CL),** 5%-30% silt, trace fine sand, mottled brownish yellow 10YR 6/6 and light brownish yellow 10YR 6/2. (Loess)		5							
409.0	Same as above.		6	D		100	2.9 to 3.1	NA	<1	
408.0			7							
407.0	Same as above.		8	E		100	2.2 to 2.5	NA	<1	
406.0			9							
405.0	Same as above, some dark brown/black staining.		10	F		100	2.2 to 2.4	NA	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-504 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.0 Completion Depth 36.0

Fed. ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373596.3 E.(Y) 787225.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL: G - K. Baker; D - G. Swift; H - R. Hoin; H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
403.0	Same as above, stiff to very stiff		12	G		100	1.7 to 3.3	NA	<1	
402.0			13							
401.0	Same as above.		14	H		100	1.7 to 2.4	NA	<1	
400.0			15							
399.0	Same as above, no staining.		16	I		79	1.7 to 2.5	NA	<1	
398.0			17							
397.0	LEAN CLAY (CL), 5%-10% silt, trace fine sand, plastic, light yellowish brown 10YR 6/4, no odor, wet, very soft to soft. (Lacustrine)		18	J		96	0.2 to 0.3	NA	<1	
396.0			19							
395.0	Same as above, some laminae.		20	K		71	0.2 to 0.7	NA	<1	
394.0			21							
	SANDY SILT (ML), 30%-40% fine sand, 5%-10% clay, non-plastic, light brownish									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-504 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 415.0 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373596.3 E.(Y) 787225.7

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	gray 2.5Y 6/2, no odor, wet, very soft to medium stiff. (Lacustrine)			L		63	0.2 to 0.8	NA	<1	
392.0	Same as above.		23							
391.0	Same as above, varies in clay concentration from 10%-50% clay, very soft to soft.		24	M		75	0.2 to 0.4	NA	<1	
390.0			25							
389.0	Same as above.		26	N		79	0.2	NA	<1	
388.0			27							
387.0	**POORLY GRADED SAND (SP)**, 5% silt, non-plastic, light brownish gray 10YR 6/3, no odor, wet, very loose. (Lacustrine)		28	O		100	0.2 to 0.5	NA	<1	
386.0			29							
385.0	Same as above.		30	P		100	0.2 to 0.4	NA	<1	
384.0			31							
383.0	**LEAN CLAY (CL)**, 5%-10% silt, trace fine to coarse sand, plastic, gray 2.5Y 5/1, uniform color and texture, no odor, wet, stiff to very stiff. (Till)		32	Q		100	1.2 to 2.2	NA	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No: _____ County: Williamson Boring No.: SB-504 Monitor Well No.: _____

Site File Name: Crab Orchard National Wildlife Refuge Surface Elevation: 415.0 Completion Depth: 36.0

Fed. ID. No.: _____ Auger Depth: _____ Rotary Depth: _____

Quadrangle: NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 9/20/00 Finish 9/20/00

UTM (or State Plane) Coord. N.(X) 373596.3 E (Y) 787225.7

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location: South Side of Repository

Drilling Equipment: Geoprobe 66DT Track

PERSONNEL:
G - K. Baker
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
381.0	Same as above, medium stiff to stiff.		34	R		100	0.5 to 1.7	NA	<1	
380.0			35							
379.0	End of Boring at 36 feet.		36							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-505 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 416.6 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373464.6 E.(Y) 787175.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	LEAN CLAY (CL), 30%-40% silt, trace fine sand, plastic, yellowish brown 10YR 6/8, moist, no odor.			A		100	1.0	NA	<2	
415.6			1							
414.6	Same as above, dry, no odor.		2	B		100	1.5	NA	<2	
413.6			3							
412.6	Same as above, 20%-30% silt, dry, no odor, but gray and brown mottling, black/dark brown staining.		4	C		100	2.0	NA	<2	
411.6			5							
410.6	Same as above, dry, no odor.		6	D		100	2.5	NA	<2	
409.6			7							
408.6	Same as above, dry, no odor.		8	E		100	4.0	NA	<2	
407.6			9							
406.6	Same as above, dry, no odor.		10	F		100	2.0	NA	<2	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-505 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 416.6 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373464.6 E.(Y) 787175.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
404.6	Same as above, moist, no odor.		12	G		100	2.0	NA	<2	
403.6			13							
402.6	Same as above, moist, no odor, trace sand.		14	H		100	2.5	NA	<2	
401.6	2" sand seam at 15.3' bgs.		15							
400.6	Same as above, no staining, moist, no odor.		16	I		100	3.0	NA	<2	
399.6			17							
398.6	Same as above, moist, no odor.		18	J		100	1.0	NA	<2	
397.6			19							
396.6	Same as above, moist, no odor.		20	K		100	1.5	NA	<2	
395.6			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-505 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 416.6 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373464.6 E.(Y) 787175.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				L		100	NR	NA	<2	
393.6	**SILTY SAND (SM)**, 30%-40% silt, 10% clay, gray 10YR 5/1, wet, no odor.		23							
392.6	Same as above, less fines (20%-40%)		24	M		100	NA	NA	<2	
391.6			25							
390.6	Same as above, loose.		26	N		100	NA	NA	<2	
389.6			27							
388.6	**POORLY GRADED SAND (SP)**, fine sand, trace silt, gray 10YR 5/1, wet, no odor.		28	O		100	NA	NA	<2	
387.6			29							
386.6	Same as above.		30	P		100	NA	NA	<2	
385.6			31							
384.6	**LEAN CLAY (CL)**, trace gravel, plastic, gray 10YR 5/1, moist, no odor. (Till)		32	Q		100	3.0	NA	<2	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No SB-505 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 416.6 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec 32 T. 9 S R 2 E Date: Start 10/1/00 Finish 10/1/00

UTM (or State Plane) Coord. N.(X) 373464.6 E (Y) 787175.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - R. Hafemeister
D - G. Swift
H - R. Hoin
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
382.6	Same as above.		34	R		100	3.0	NA	<2	
381.6			35							
	2" sand seam at 35.5' bgs.									
380.6	End of Boring at 36 feet.		36							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-506 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.9 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/12/00 Finish 10/12/00

UTM (or State Plane) Coord. N.(X) 373580.1 E.(Y) 787098.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
412.9	**LEAN CLAY (CL)**, 5%-30% silt, trace fine sand, plastic to non-plastic, mottled brownish yellow 10YR 6/6 and light brownish yellow 10YR 6/2, no odor, moist, very stiff. (Loess)		1	A		100	2.8 to 4.0	NA	<2	
411.9	Same as above, little black staining.		2	B		100	2.5 to 3.5	NA	<2	
410.9			3							
409.9	Same as above.		4	C		100	2.7 to 3.2	NA	<2	
408.9			5							
407.9	Same as above, stiff to very stiff.		6	D		100	1.8 to 2.8	NA	<2	
406.9			7							
405.9	Same as above, stiff.		8	E		100	1.5 to 1.8	NA	<2	
404.9			9							
403.9	Same as above, stiff to hard.		10	F		100	3.2 to 4.3	NA	<2	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-506 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.9 Completion Depth 36.0

Fed ID No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date: Start 10/12/00 Finish 10/12/00

UTM (or State Plane) Coord. N.(X) 373580.1 E (Y) 787098.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
401.9	Same as above, no staining, stiff.		12	G		100	1.7 to 2.5	NA	<2	
400.9			13							
399.9	Same as above, stiff to very stiff.		14	H		100	1.0 to 3.3	NA	<2	
398.9			15							
397.9	Same as above.		16	I		100	1.1 to 2.5	NA	<2	
396.9			17							
395.9	Same as above, with 5%-10% fine sand.		18	J		100	1.0 to 2.5	NA	<2	
394.9			19							
393.9	Same as above, less sand.		20	K		100	1.0 to 2.2	NA	<2	
392.9			21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-506 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.9 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/12/00 Finish 10/12/00

UTM (or State Plane) Coord. N.(X) 373580.1 E.(Y) 787098.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL
G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, lower 12" has 30%-40% silt, 5% fine sand.			L		100	1.5 to 2.2	NA	<2	
390.9			23							
389.9	**SILTY SAND (SM),** 10%-20% silt, fine to medium sand, non-plastic, light yellowish brown 2.5Y 6/4 to strong brown 7.5YR 5/6, no odor, wet, very loose.		24	M		100	<0.2	NA	<2	
388.9			25							
387.9			26	N		100	1.2 to 1.4	NA	<2	
386.9	**LEAN CLAY (CL),** trace fine to coarse sand, occasional pebbles, plastic, gray 2.5Y 5/1, uniform color and texture, moist to wet, stiff. (Till)		27							
385.9	Same as above, soft.		28	O		17	0.2 to 0.4	NA	<2	
384.9			29							
383.9	Same as above.		30	P		33	0.4	NA	<2	
382.9			31							
381.9	Same as above, stiff.		32	Q		100	1.0 to 1.8	NA	<2	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. SB-506 Monitor Well No. _____

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 413.9 Completion Depth 36.0

Fed. ID. No. _____ Auger Depth _____ Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 10/12/00 Finish 10/12/00

UTM (or State Plane) Coord. N.(X) 373580.1 E (Y) 787098.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South Side of Repository

Drilling Equipment Geoprobe 66DT Track

PERSONNEL

G - K. Baker
D - G. Swift
H - D. Powney
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
379.9	Same as above.		34	R		100	1.0 to 2.0	NA	<2	
378.9			35							
377.9	End of Boring at 36 feet.		36							

(950228)

Appendix B
Groundwater Monitoring Well Boring Logs and Well Construction Information

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-42 Monitor Well No. 33MWC-42

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 410.1 Completion Depth 14.2

Fed. ID. No. _____ Auger Depth 14.2 Rotary Depth _____

Quadrangle SE 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/12/00 Finish 10/12/00

UTM (or State Plane) Coord. N.(X) 374372.2 E.(Y) 787924.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location East of the East Swale

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
409.1			1							
408.1	BLIND DRILLED TO 14.2 FEET BGS. SEE LOG FOR 33MWC-43 FOR DETAILED GEOLOGIC DESCRIPTIONS.		2							
407.1			3							
406.1			4							
405.1			5							
404.1			6							
403.1			7							
402.1			8							
401.1			9							
400.1			10							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No 33MWC-42 Monitor Well No 33MWC-42

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 410.1 Completion Depth 14.2

Fed ID. No. _____ Auger Depth 14.2 Rotary Depth _____

Quadrangle SE 1/4 of NW 1/4 Sec. 32 T 9 S R 2 E Date Start 10/12/00 Finish 10/12/00

UTM (or State Plane) Coord. N.(X) 374372.2 E (Y) 787924.5

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location East of the East Swale

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
398.1			12							
397.1			13							
396.1			14							
	End of Boring at 14.2 feet.									

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-43 Monitor Well No. 33MWC-43

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 410.0 Completion Depth 28.5

Fed. ID. No. _____ Auger Depth 26 Rotary Depth _____

Quadrangle SE 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/11/00 Finish 10/11/00

UTM (or State Plane) Coord. N.(X) 374370.4 E.(Y) 787921.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location East of the East Swale

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 30% clay, 10% to 20% fine sand, non-plastic, 10YR 5/4 yellowish brown, no odor, dry, crumbly, faint laminations.			A		25	NM	4 7 8 8	13	
409.0			1							
408.0	Same as above, slightly less crumbly, becomes 10YR 6/1 light gray at 3.5' bgs, mottled with 10YR 5/4 yellow brown.		2	B		63	1.5 to 2.5	3 3 3 3	5	
407.0			3							
406.0	Same as above, increasing clay content with depth, slightly plastic, less mottling, no laminations.		4	C		50	1.0 to 2.5	3 3 5 6	<1	
405.0			5							
404.0	**LEAN CLAY (CL)**, 25% to 30% silt, trace to 10% fine sand, plastic to slightly plastic, 10YR 4/3 brown mottled with 10YR 5/2 grayish brown, more gray near base of sample, no odor, slightly moist.		6	D		100	0.5 to 2.0	4 5 7 8	<1	
403.0			7							
402.0	Same as above, occasional pockets of silt, more 10YR 4/4 dark yellow brown than gray.		8	E		75	1.0 to 2.5	3 5 7 8	<1	
401.0	Zone of black staining from 9.3' to 10' bgs.		9							
400.0	<Shelby tube collected from 10' to 12.5' bgs.>		10	F			NA	NA	NA	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No 33MWC-43 Monitor Well No 33MWC-43

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 410.0 Completion Depth 28.5

Fed ID. No. _____ Auger Depth 26 Rotary Depth _____

Quadrangle SE 1/4 of NW 1/4 Sec. 32 T. 9 S R 2 E Date: Start 10/11/00 Finish 10/11/00

UTM (or State Plane) Coord. N.(X) 374370.4 E.(Y) 787921.2

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location East of the East Swale

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
398.0			12					3 4 7 7		
397.0	LEAN CLAY (CL), as above, but nearly 40% silt, 20% fine sand, slightly plastic 10YR 5/6 yellowish brown.		13	G		63	2.0 to 3.0		<1	
396.0	Same as above, faint laminations present.		14	H		71	1.0	3 3 4 5	<1	
395.0	SILT (ML), little clay, 10% to 20% fine sand, slightly plastic to non-plastic, 10YR 5/3 brown, slightly mottled with 10YR 4/3 brown, laminated, some laminae are silty sand, wet.		15				<0.5			Gradational change.
394.0	Same as above, laminae are less distinct, occasional zones of silty lean clay (<2" thick), mottled with 10YR 5/1 gray, moist to wet.		16	I		63	0.5 to 1.5	3 3 6 7	<1	
393.0			17							
392.0	Same as above, 4" poorly graded sand at 18' bgs.		18	J		100	0.5 to 1.0	3 5 5 5	<1	
391.0	SILTY SAND (SM), 15% to 20% silt, 10% fine gravel, non-plastic, 10YR 4/3 brown, wet.		19				<0.5			
390.0	POORLY GRADED SAND (SP), 5% to 10% silt, trace fine gravel, 10YR 5/1 gray, no odor, wet.		20	K		75	<0.5	2 2 2 2	<1	Rock in spoon tip is gray weathered sandstone.
	Color change to 10YR 5/2 grayish brown.									
389.0			21							
	SANDY SILT WITH GRAVEL (ML), 30% fine sand, 10% to 20% fine gravel.						1.0 to 1.5			

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-43 Monitor Well No. 33MWC-43

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 410.0 Completion Depth 28.5

Fed. ID. No. _____ Auger Depth 26 Rotary Depth _____

Quadrangle SE 1/4 of NW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/11/00 Finish 10/11/00

UTM (or State Plane) Coord. N.(X) 374370.4 E.(Y) 787921.2

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location East of the East Swale

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	non-plastic, 10YR 5/1 gray, moist. Same as above, trace fine gravel, becoming siltier with depth.			L		75	0.5 to 1.0	2 3 3 4	<1	
387.0			23							
386.0	**LEAN CLAY (CL),** 25% to 30% silt, trace to 10% fine sand, trace fine gravel, plastic, 10YR 5/1 gray, moist, uniform color and texture. (Till) Same as above, trace to 10% fine gravel. (Till)		24	M		63	0.5 to 1.0	6 1 1 1	<1	
385.0			25							
384.0	<Shelby tube collected from 26' to 28.5' bgs. Lean clay in spoon tip, as at 24' bgs.>		26	N			NA	NA	NA	
383.0			27							
382.0			28							
	End of Boring at 28.5 feet. Drilled to 26' bgs; Shelby Tube to 28.5' bgs.									

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-44 Monitor Well No. 33MWC-44

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.8 Completion Depth 21.0

Fed. ID. No. _____ Auger Depth 21 Rotary Depth _____

Quadrangle NW 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 10/11/00 Finish 10/11/00

UTM (or State Plane) Coord. N.(X) 371682.5 E.(Y) 785201.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location HWY 148

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
410.8			1							
409.8	BLIND DRILLED TO 21 FEET BGS. SEE LOG FOR 33MWC-45 FOR DETAILED GEOLOGIC DESCRIPTIONS.		2							
408.8			3							
407.8	<Heavy oil odor noted in soil cuttings in shallow soil (upper 3 feet). Maybe oil from former road surface.>		4							
406.8			5							
405.8			6							
404.8			7							
403.8			8							
402.8			9							
401.8			10							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No 33MWC-44 Monitor Well No. 33MWC-44

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.8 Completion Depth 21.0

Fed. ID. No. _____ Auger Depth 21 Rotary Depth _____

Quadrangle NW 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date Start 10/11/00 Finish 10/11/00

UTM (or State Plane) Coord. N.(X) 371682.5 E (Y) 785201.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location HWY 148

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
389.8			12							
388.8			13							
387.8			14							
386.8			15							
385.8			16							
384.8			17							
383.8			18							
382.8			19							
381.8			20							
380.8	End of Boring at 21 feet.		21							

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-45 Monitor Well No. 33MWC-45

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.5 Completion Depth 48.5

Fed. ID. No. _____ Auger Depth 46 Rotary Depth _____

Quadrangle NW 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 10/10/00 Finish 10/10/00

UTM (or State Plane) Coord. N.(X) 371677.8 E.(Y) 785202.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location HWY 148

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	WELL GRADED GRAVEL AND SAND (GW), base course (former road surface), light gray, no odor, dry.			A		25		8 30 15 17	<1	
410.5			1							
409.5	**SILT (ML)**, 10% clay, non-plastic, 10YR 4/2 dark gray brown, no odor, dry, extensive vertical and horizontal fracturing.		2	B		50	1.0	4 4 4 6	<1	
408.5			3							
407.5	Poor recovery--roots and twigs in a silty matrix (rock in spoon tip).		4	C		0		4 4 5 6	<1	
406.5			5							
405.5	No recovery--cutting are gray silt, 30-40% clay, trace to 10% fine sand, plastic, 10YR 4/1 dark gray, no odor, moist.		6	D		0		2 3 5 6	<1	
404.5			7							
403.5	**LEAN CLAY (CL)**, 20-30% silt, trace to 10% fine sand, plastic to slightly plastic, 10YR 5/4 yellow brown mottled with 10YR 6/1 gray, moist, becomes sandier in last 2" of interval.		8	E		75	1.0 to 2.0	2 2 3 4	<1	
402.5			9							
401.5	<Shelby tube collected from 10' to 12.5' bgs.>		10	F			NA	NA	NA	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No 33MWC-45 Monitor Well No 33MWC-45

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.5 Completion Depth 48.5

Fed. ID. No. _____ Auger Depth 46 Rotary Depth _____

Quadrangle NW 1/4 of NW 1/4 Sec 5 T 10 S R 2 E Date Start 10/10/00 Finish 10/10/00

UTM (or State Plane) Coord. N.(X) 371677.8 E.(Y) 785202.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location HWY 148

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
399.5			12					4 5 7 8		
399.5	Base of shelby tube, silty clay as at 8' bgs. LEAN CLAY (CL), as at 8' bgs, but more brown (less mottled), some black staining, more stiff at base.		13	G		100	1.0 to 3.0		<1	
397.5	Same as above, few vertical fractures, black staining along fracture faces.		14	H		100	1.5 to 3.0	2 3 4 6	<1	
396.5			15							
395.5	Same as above, less black staining, still mottled gray and brown, fewer vertical fractures--gray staining along fracture faces.		16	I		75	1.5 to 3.0	3 3 4 5	<1	
394.5			17							
393.5	Same as above, but trace very fine gravel, 10YR 5/4 yellow brown, little black staining, less fracturing (trace fractures).		18	J		83	1.0 to 3.5	3 4 5 5	<1	
392.5			19							
391.5	Same as above, trace medium gravel.		20	K		100	2.0 to 3.0	4 5 7 7	<1	
390.5			21							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-45 Monitor Well No. 33MWC-45

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.5 Completion Depth 48.5

Fed. ID. No. _____ Auger Depth 46 Rotary Depth _____

Quadrangle NW 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 10/10/00 Finish 10/10/00

UTM (or State Plane) Coord. N.(X) 371677.8 E.(Y) 785202.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location HWY 148

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, wet in some fractures.			L		83	2.0 to 3.0	4 5 7 9	<1	
388.5			23							
387.5	Same as above, top 4"-6" soft (pp < 0.5).		24	M		100	0.5 to 1.5	3 3 3 3	<1	
386.5			25							
385.5	Color change to 10YR 4/1 dark gray, uniform clay, trace to 5% fine gravel, 20%-40% silt, 5% fine sand. Same as above at 25.5' bgs, silt and sand content increase with depth.		26	N		75	1.0 to 1.5	3 3 4 5	3	
384.5			27							
383.5	**POORLY GRADED SAND (SP)**, medium sand, 10% silt, 10YR 4/1 dark gray, no odor, wet.		28	O		100	<0.5	3 5 5 6	<1	
	LEAN CLAY (CL), as at 26' bgs.									
382.5			29							
381.5	**SILTY SAND WITH GRAVEL (SM)**, 20% silt, 15% fine to medium gravel, no odor, 10YR 4/1 dark gray, wet. Same as above, 30%-40% silt, some banding of siltier layers with sand in base of spoon.		30	P		50	<0.5	8 10 16 20	<1	
380.5			31							
379.5	Same as above, varies from 10%-40% silt, trace to 20% fine gravel.		32	Q		83	<0.5	8 12 15 19	<1	

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No 33MWC-45 Monitor Well No 33MWC-45

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.5 Completion Depth 48.5

Fed. ID. No. _____ Auger Depth 46 Rotary Depth _____

Quadrangle NW 1/4 of NW 1/4 Sec. 5 T 10 S R 2 E Date Start 10/10/00 Finish 10/10/00

UTM (or State Plane) Coord. N.(X) 371677.8 E (Y) 785202.8

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location HWY 148

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Zone of 40% gravel from 33.5'-33.8' bgs.									
377.5	Same as above, trace to 5% fine gravel, siltier at base (30%-40% silt).		34	R		75	<0.5	8 12 18 20	<1	
376.5			35							
375.5	**POORLY GRADED SAND (SP)**, trace to 10% silt (varies), 10YR 4/1 dark gray, no odor, wet. (Poor recovery)		36	S		1		10 13 15 21	3	
374.5			37							
373.5	**SILTY SAND (SM)**, 5%-10% fine gravel, 10YR 4/1 dark gray, wet.		38	T		100		10 17 19 19	<1	
372.5	**SILTY LEAN CLAY (CL)**, 20% fine sand, 30% silt, slightly plastic to non-plastic, 10YR 4/1 dark gray, moist.		39							
371.5	**SANDY SILT WITH CLAY (ML)**, 30%-40% clay, 20%-30% fine sand, non-plastic, 10YR 4/1 dark gray, moist.		40	U		63	3.0 to 3.5	8 12 17 32	<1	
370.5	Same as above, grading to a silt with sand at 41' bgs, faint banding of silty and sandy layers present.		41							
369.5	2" poorly graded sand with silt layer, fine sand, 10% silt, 10YR 4/1 dark gray, moist. **SILT (ML)**, with sand, 30%-40% fine sand, non-plastic, no odor, moist, 10YR 4/1 dark gray, faint layering continues.		42	V		63	3.5	8 13 16 30	<1	
368.5			43							

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Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-45 Monitor Well No. 33MWC-45

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 411.5 Completion Depth 48.5

Fed. ID. No. _____ Auger Depth 46 Rotary Depth _____

Quadrangle NW 1/4 of NW 1/4 Sec. 5 T. 10 S R. 2 E Date: Start 10/10/00 Finish 10/10/00

UTM (or State Plane) Coord. N.(X) 371677.8 E.(Y) 785202.8

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location HWY 148

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above.			W		71		10 11 11 12	<1	
366.5			45							
	LEAN CLAY (CL), 30% silt, 10% fine sand, trace fine gravel, plastic, 10YR 4/1 dark gray, no odor, moist. (Till) <Shelby tube collected from 46' to 48.5' bgs.>						2.0 to 3.0			
365.5			46	X			NA	NA	NA	
364.5			47							
363.5			48							
	End of Boring at 48.5 feet. Drilled to 46' bgs; Shelby Tube to 48.5' bgs.									

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-46 Monitor Well No. 33MWC-46

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 417.7 Completion Depth 20.3

Fed. ID. No. _____ Auger Depth 20.3 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/13/00 Finish 10/13/00

UTM (or State Plane) Coord. N.(X) 373608.7 E.(Y) 787291.1

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South of Area 9 Repository

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
416.7			1							
415.7	BLIND DRILLED TO 20.3 FEET BGS. SEE LOG FOR 33MWC-47 FOR DETAILED GEOLOGIC DESCRIPTIONS.		2							
414.7			3							
413.7			4							
412.7			5							
411.7			6							
410.7			7							
409.7			8							
408.7			9							
407.7			10							

(950226)

Illinois Environmental Protection Agency **Field Boring Log** Page 2 of 2

Site File No. _____ County Williamson Boring No 33MWC-46 Monitor Well No. 33MWC-46

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 417.7 Completion Depth 20.3

Fed ID. No _____ Auger Depth 20.3 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 10/13/00 Finish 10/13/00

UTM (or State Plane) Coord. N.(X) 373608.7 E (Y) 787291.1

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South of Area 9 Repository

Drilling Equipment CME 750

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLES: SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
405.7			12							
404.7			13							
403.7			14							
402.7			15							
401.7			16							
400.7			17							
399.7			18							
398.7			19							
397.7			20							

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

End of Boring at 20.3 feet.

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-47 Monitor Well No. 33MWC-47

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 417.7 Completion Depth 36.5

Fed. ID. No. _____ Auger Depth 34 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/12/00 Finish 10/12/00

UTM (or State Plane) Coord. N.(X) 373606.3 E.(Y) 787289.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South of Area 9 Repository

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 40% clay, 10% fine sand, non-plastic, 10YR 5/3 brown, no odor, dry. Poor recovery, pushed a rock.			A		1	NM	5 8 7 8	<1	
416.7			1							
415.7			2	B		63	2.0 to 3.0	3 3 3 7	<1	
414.7			3							
413.7	**LEAN CLAY (CL)**, 25%-30% silt, 10% fine sand, slightly plastic, 10YR 5/4 brown mottled with 10YR 6/2 light brownish gray, no odor, moist.		4	C		50	2.0	3 4 6 7	<1	
412.7	Same as above.		5							
411.7	Same as above, little black staining.		6	D		100	2.0 to 3.0	7 8 9 11	<1	
410.7			7							
409.7	Same as above, more black staining.		8	E		75	1.0 to 2.5	2 3 5 7	<1	
408.7			9							
407.7	Same as above, trace very fine gravel (2 pieces), less black staining (as at 6'), occassional pockets of gray silt, faint laminae in top 1".		10	F		75	1.0 to 3.0	2 3 5 7	<1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No 33MWC-47 Monitor Well No. 33MWC-47

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 417.7 Completion Depth 36.5

Fed. ID No. _____ Auger Depth 34 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 10/12/00 Finish 10/12/00

UTM (or State Plane) Coord. N.(X) 373606.3 E (Y) 787289.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South of Area 9 Repository

Drilling Equipment CME 750

PERSONNEL
G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
405.7	<Shelby tube collected from 12' to 14.5' bgs.>	12	G			NA	NA	NA	
404.7		13							
403.7		14					4 5 7 7		
	Same as above (at 10'), no laminae, black staining along vertical fracture faces.		H		67	2.5 to 3.0		<1	
402.7		15							
401.7	Same as above, less black staining, fracturing less apparent.	16	I		92	1.5 to 3.0	3 4 5 5	<1	
400.7		17							
399.7	Same as above, no black staining, no noticeable fracturing.	18	J		92	1.0 to 2.5	4 4 4 4	<1	
398.7		19							
397.7	Same as above, less mottling, mostly 10YR 5/6 yellowish brown, little black staining.	20	K		100	2.0 to 3.0	2 3 4 4	<1	
396.7		21							

(950228)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-47 Monitor Well No. 33MWC-47

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 417.7 Completion Depth 36.5

Fed. ID. No. _____ Auger Depth 34 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/12/00 Finish 10/12/00

UTM (or State Plane) Coord. N.(X) 373606.3 E.(Y) 787289.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location South of Area 9 Repository

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
				L		83		2 2 2 2	<1	
394.7	**SILTY SAND (SM)**, 30%-40% silt near top to 15%-20% silt at base, 10YR 6/6 brownish yellow, no odor, wet.		23							
393.7	Same as above, 20%-40% silt, less silt at base.		24	M		63		3 3 4 5	<1	
392.7			25							
391.7	**POORLY GRADED SAND (SP)**, 5% silt, 10YR 6/4 light yellowish brown, no odor, wet, occassional zones of silt and silty sand (<1" thick).		26	N		100		3 4 5 10	2	
390.7			27							
389.7	Same as above, no silt or silty sand layers.		28	O		83		4 6 9 11	8	
388.7			29							
387.7	Same as above, 5%-10% silt.		30	P		63		10 14 26 30	12	
386.7			31							
385.7	Same as above.		32	Q		71		4 5 8 8	25	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-47 Monitor Well No 33MWC-47

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 417.7 Completion Depth 36.5

Fed. ID. No. _____ Auger Depth 34 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R 2 E Date Start 10/12/00 Finish 10/12/00

UTM (or State Plane) Coord. N.(X) 373606.3 E.(Y) 787289.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location South of Area 9 Repository

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Color change to 10YR 4/4 dark yellowish brown, coarser sand, 10% fine gravel, grades to a thin black silty zone above clay.									
383.7	LEAN CLAY (CL). 25%-30% silt, 10% fine sand, trace fine gravel (chunks of weathered gray sandstone), plastic, 10YR 5/1 gray, no odor, moist. (Till) <Shelby tube collected from 34' to 36.5' bgs.>		34	R		0.5 to 1.0	NA	NA		Black silt at base of sand has an almost oily appearance and texture. Probably altered clay. No odor, but high PID hit.
382.7			35							
381.7			36							

End of Boring at 36.5 feet.

Drilled to 34' bgs; Shelby Tube to 36.5' bgs. Re-drilled boring to 34.2' bgs to set well.

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-48 Monitor Well No. 33MWC-48

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.5 Completion Depth 20.5

Fed. ID. No. _____ Auger Depth 20.5 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/14/00 Finish 10/14/00

UTM (or State Plane) Coord. N.(X) 373531.8 E.(Y) 786830.5

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
419.5	BLIND DRILLED TO 20.5 FEET BGS. SEE LOG FOR 33MWC-49 FOR DETAILED GEOLOGIC DESCRIPTIONS.		1							
418.5			2							
417.5			3							
416.5			4							
415.5			5							
414.5			6							
413.5			7							
412.5			8							
411.5			9							
410.5			10							

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-48 Monitor Well No. 33MWC-48

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.5 Completion Depth 20.5

Fed. ID. No _____ Auger Depth 20.5 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 10/14/00 Finish 10/14/00

UTM (or State Plane) Coord. N.(X) 373531.8 E (Y) 786830.5

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408.5			12							
407.5			13							
406.5			14							
405.5			15							
404.5			16							
403.5			17							
402.5			18							
401.5			19							
400.5			20							

End of Boring at 20.5 feet.

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-49 Monitor Well No. 33MWC-49

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.4 Completion Depth 38.0

Fed. ID. No. _____ Auger Depth 36 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/13/00 Finish 10/14/00

UTM (or State Plane) Coord. N.(X) 373535.5 E.(Y) 786826.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	SILT (ML), 20%-40% clay, 10% fine sand, trace gravel, non-plastic, 10YR 5/4 yellowish brown, no odor, dry.			A		25	2.5 to 3.5	3 4 5 7	4	
419.4			1							
	Increasing clay near base.									
418.4	**LEAN CLAY (CL)**, 25%-35% silt, 10% fine sand, slightly plastic, 10YR 5/4 yellow brown, moist, slightly mottled.		2	B		83	2.0 to 2.5	3 5 6 8	2	
417.4			3							
416.4	Same as above.		4	C		75	1.5	3 5 5 7	2	
415.4			5							
414.4	Same as above, more mottling, yellow brown with 10YR 6/1 gray.		6	D		75	2.0	3 5 8 8	1	
413.4			7							
412.4	Same as above, faint laminae in upper 4", none below.		8	E		100	1.0 to 2.5	4 6 7 7	1	
411.4			9							
410.4	Same as above, little black staining.		10	F		83	2.0 to 3.0	3 4 8 8	1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No 33MWC-49 Monitor Well No 33MWC-49

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.4 Completion Depth 38.0

Fed ID No. _____ Auger Depth 36 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec 32 T 9 S R 2 E Date Start 10/13/00 Finish 10/14/00

UTM (or State Plane) Coord. N.(X) 373535.5 E.(Y) 786826.9

Latitude ___ ___ ___ Longitude ___ ___ ___

Boring Location Building I-1-36A

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
408.4	Same as above, black staining along fractures.		12	G		100	3.0	NR	<1	
407.4			13							
406.4	Same as above, increased black staining.		14	H		100	1.0 to 1.5	3 3 5 6	2	
405.4			15							
404.4	Same as above, 10YR 5/6 yellowish brown, less gray mottling, less black staining, fractures are wet.		16	I		100	1.5 to 3.0	2 4 6 6	1	
403.4			17							
402.4	<Shelby tube collected from 18' to 20.5' bgs.>		18	J			NA	NA	NA	
401.4			19							
400.4			20					3 3 3 3		
399.4	Same as above, 10YR 5/4 yellowish brown, outside of spoon is wet (may have crossed a sand seam above).		21	K		100	1.0 to 1.5		1	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No. 33MWC-49 Monitor Well No. 33MWC-49

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.4 Completion Depth 38.0

Fed. ID. No. _____ Auger Depth 36 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T. 9 S R. 2 E Date: Start 10/13/00 Finish 10/14/00

UTM (or State Plane) Coord. N.(X) 373535.5 E.(Y) 786826.9

Latitude ___° ___' ___" Longitude ___° ___' ___"

Boring Location Building I-1-36A

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO.	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, occassional soft zones (pp = 0.5).			L		83	0.5 to 2.5	5 7 8 8	<1	
397.4			23							
396.4			24	M		100	0.5 to 2.5	4 6 8 8	<1	
395.4	**SANDY SILT (ML)**, 30% sand, 10%-20% clay, 10YR 5/4 yellow brown, slightly plastic, no odor, moist.		25							
394.4	**LEAN CLAY (CL)**, as at 22' bgs.		26	N		83	0.5 to 1.5	2 2 2 2	<1	
393.4			27							
	SANDY SILT (ML), as at 24.8' bgs, 10YR 6/4 light yellow brown.									
392.4	Same as above.		28	O		33	<0.5	2 2 2 2	1	
391.4			29							
390.4	Same as above.		30	P		75		4 6 5 6	2	
389.4			31							
388.4	**POORLY GRADED SAND (SP)**, 10% silt, 10YR 6/6 brownish yellow, no odor, wet.		32	Q		42		4 7 9 10	16	

(950226)

Illinois Environmental Protection Agency — Field Boring Log

Site File No. _____ County Williamson Boring No 33MWC-49 Monitor Well No 33MWC-49

Site File Name Crab Orchard National Wildlife Refuge Surface Elevation 420.4 Completion Depth 38.0

Fed. ID. No. _____ Auger Depth 36 Rotary Depth _____

Quadrangle NE 1/4 of SW 1/4 Sec. 32 T 9 S R 2 E Date Start 10/13/00 Finish 10/14/00

UTM (or State Plane) Coord. N.(X) 373535.5 E (Y) 786826.9

Latitude ___ ° ___ ' ___ " Longitude ___ ° ___ ' ___ "

Boring Location Building I-1-36A

Drilling Equipment CME 750

PERSONNEL

G - M. Westover
D - Bob Dreyer
H - Joe Butler
H -

Elev.	DESCRIPTION OF MATERIALS	Graphic Log	Depth in feet	SAMPLE NO	SAMPLE TYPE	SAMPLE RECOVERY (%)	PENETROMETER	N VALUES (BLOW COUNTS)	OVA or HNU READINGS	REMARKS
	Same as above, color change to 10YR 5/4 yellow brown at 33.5', with some black staining, sand coarsens with depth, trace fine gravel.									
386.4	SILTY LEAN CLAY (CL), 30% silt, plastic, 10YR 5/1 gray, very uniform color and texture, no odor, moist. (Till)		34	R			1.5			
385.4			35							
	<Shelby tube collected from 35.5' to 38' bgs.>									
384.4	Same as above, faint laminations.		36					4 4 4 5		
				S		25	0.5 to 1.0		2	QC sample looks like glacial till, but has no gravel and very faint laminations.
383.4			37							
382.4	End of Boring at 38.0 feet.		38							

Drilled to 36' bgs; Split Spoon sampled to 38' bgs.

Illinois Environmental Protection Agency — Well Completion Report

SITE #: _____ COUNTY: Williamson WELL #: 33MWC-42

SITE NAME: Crab Orchard National Wildlife Refuge BOREHOLE #: 33MWC-42

STATE PLANE COORDINATE: X 374372.2 Y 787924.5 (or) LATITUDE ___° ___' ___" LONGITUDE ___° ___' ___"

SURVEYED BY: Shawnee Surveying ILL. REGISTRATION #: 3085

DRILLING CONTRACTOR: MATECO, Inc. DRILLER: Bob Dreyer

CONSULTING FIRM: RMT, Inc. GEOLOGIST: M. Westover

DRILLING METHOD: 4 1/4" HSA DRILLING FLUIDS (TYPE): None

LOGGED BY: M. Westover-RMT, Inc. DATE STARTED: 10/12/00 DATE FINISHED: 10/12/00

REPORT FORM COMPLETED BY: RMT, Inc. DATE: 1/30/01

ANNULAR SPACE DETAILS

TYPE OF SURFACE SEAL: Concrete

TYPE OF ANNULAR SEALANT: Bentonite Chips

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

TYPE OF BENTONITE SEAL - GRANULAR (PELLET) SLURRY (CIRCLE ONE)

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

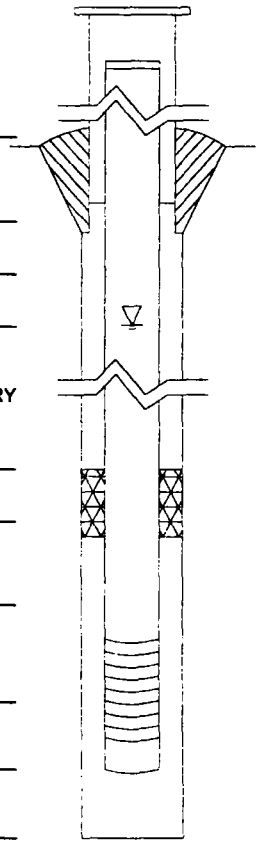
TYPE OF SAND PACK: Quartz (UNIMIN FilterSil)

GRAIN SIZE: #5 (SIEVE SIZE)

INSTALLATION METHOD: Gravity/Tremmie

TYPE OF BACKFILL MATERIAL: None (IF APPLICABLE)

INSTALLATION METHOD: NA



ELEVATIONS (MSL)*	DEPTHS (BGS) (.01 ft)	
		TOP OF PROTECTIVE CASING
412.99	-2.94	TOP OF RISER PIPE
410.05	0.00	GROUND SURFACE
408.55	1.50	TOP OF ANNULAR SEALANT
399.86	10.19	STATIC WATER LEVEL (AFTER COMPLETION)
408.55	1.50	TOP OF SEAL
406.15	3.90	TOP OF SANDPACK
406.05	4.00	TOP OF SCREEN
396.05	14.00	BOTTOM OF SCREEN
395.85	14.20	BOTTOM OF WELL
395.85	14.20	BOTTOM OF BOREHOLE

* REFERENCED TO A NATIONAL GEODETIC VERTICAL DATUM

WELL CONSTRUCTION MATERIALS (CIRCLE ONE)

PROTECTIVE CASING	SS304	(SS316)	PTFE	PVC	OTHER:
RISER PIPE ABOVE W.T.	SS304	(SS316)	PTFE	PVC	OTHER:
RISER PIPE BELOW W.T.	SS304	(SS316)	PTFE	PVC	OTHER:
SCREEN	SS304	(SS316)	PTFE	PVC	OTHER:

CASING MEASUREMENTS

DIAMETER OF BOREHOLE	(in)	8.25
ID OF RISER PIPE	(in)	2
PROTECTIVE CASING LENGTH	(ft)	5
RISER PIPE LENGTH	(ft)	6.9
BOTTOM OF SCREEN TO END CAP	(ft)	0
SCREEN LENGTH (1st SLOT TO LAST SLOT)	(ft)	10
TOTAL LENGTH OF CASING	(ft)	16.9
SCREEN SLOT SIZE **	(in)	0.01

**HAND-SLOTTED WELL SCREENS ARE UNACCEPTABLE

(941014)

Illinois Environmental Protection Agency — Well Completion Report

SITE #: _____ COUNTY: Williamson WELL #: 33MWC-43

SITE NAME: Crab Orchard National Wildlife Refuge BOREHOLE #: 33MWC-43

STATE PLANE COORDINATE: X 374370.4 Y 787921.2 (or) LATITUDE ___ ° ___ ' ___ " LONGITUDE ___ ° ___ ' ___ "

SURVEYED BY: Shawnee Surveying ILL REGISTRATION #: 3085

DRILLING CONTRACTOR: MATECO, Inc. DRILLER: Bob Dreyer

CONSULTING FIRM: RMT, Inc. GEOLOGIST: M. Westover

DRILLING METHOD: 4 1/4" HSA DRILLING FLUIDS (TYPE): None

LOGGED BY: M. Westover-RMT, Inc. DATE STARTED: 10/11/00 DATE FINISHED: 10/11/00

REPORT FORM COMPLETED BY: RMT, Inc. DATE: 1/30/01

ANNULAR SPACE DETAILS

TYPE OF SURFACE SEAL: Concrete

TYPE OF ANNULAR SEALANT: Bentonite Chips

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

TYPE OF BENTONITE SEAL - GRANULAR PELLET SLURRY (CIRCLE ONE)

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

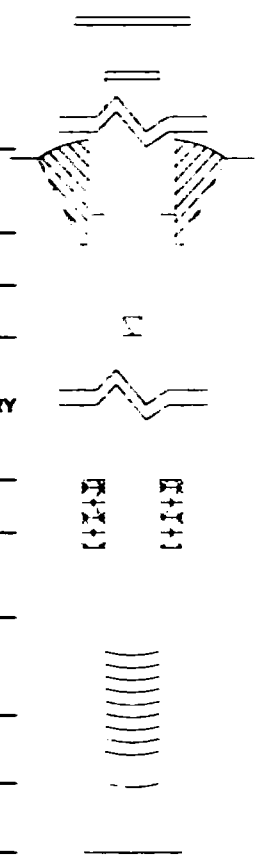
TYPE OF SAND PACK: Quartz (UNIMIN FilterSil)

GRAIN SIZE: #5 (SIEVE SIZE)

INSTALLATION METHOD: Gravity/Tremmie

TYPE OF BACKFILL MATERIAL: None (IF APPLICABLE)

INSTALLATION METHOD: NA



ELEVATIONS (MSL)*	DEPTHS (BGS) (.01 ft)	
		TOP OF PROTECTIVE CASING
412.54	-2.57	TOP OF RISER PIPE
409.97	0.00	GROUND SURFACE
408.97	1.00	TOP OF ANNULAR SEALANT
400.38	9.59	STATIC WATER LEVEL (AFTER COMPLETION)
408.97	1.00	TOP OF SEAL
393.97	16.00	TOP OF SANDPACK
392.17	17.80	TOP OF SCREEN
387.17	22.80	BOTTOM OF SCREEN
383.97	26.00	BOTTOM OF WELL
381.47	28.50	BOTTOM OF BOREHOLE

* REFERENCED TO A NATIONAL GEODETIC VERTICAL DATUM

WELL CONSTRUCTION MATERIALS (CIRCLE ONE)

PROTECTIVE CASING	SS304	SS316	PTFE	PVC	OTHER
RISER PIPE ABOVE W.T.	SS304	SS316	PTFE	PVC	OTHER
RISER PIPE BELOW W.T.	SS304	SS316	PTFE	PVC	OTHER
SCREEN	SS304	SS316	PTFE	PVC	OTHER

CASING MEASUREMENTS

DIAMETER OF BOREHOLE	(in)	8.25
ID OF RISER PIPE	(in)	2
PROTECTIVE CASING LENGTH	(ft)	7
RISER PIPE LENGTH	(ft)	20.4
BOTTOM OF SCREEN TO END CAP	(ft)	0
SCREEN LENGTH (1st SLOT TO LAST SLOT)	(ft)	5
TOTAL LENGTH OF CASING	(ft)	25.4
SCREEN SLOT SIZE **	(in)	0.01

**HAND-SLOTTED WELL SCREENS ARE UNACCEPTABLE

(941014)

Illinois Environmental Protection Agency — Well Completion Report

SITE #: _____ COUNTY: Williamson WELL #: 33MWC-44

SITE NAME: Crab Orchard National Wildlife Refuge BOREHOLE #: 33MWC-44

STATE PLANE COORDINATE: X 371682.5 Y 785201.9 (or) LATITUDE ___° ___' ___" LONGITUDE ___° ___' ___"

SURVEYED BY: Shawnee Surveying ILL. REGISTRATION #: 3085

DRILLING CONTRACTOR: MATECO, Inc. DRILLER: Bob Dreyer

CONSULTING FIRM: RMT, Inc. GEOLOGIST: M. Westover

DRILLING METHOD: 4 1/4" HSA DRILLING FLUIDS (TYPE): None

LOGGED BY: M. Westover-RMT, Inc. DATE STARTED: 10/11/00 DATE FINISHED: 10/11/00

REPORT FORM COMPLETED BY: RMT, Inc. DATE: 1/30/01

ANNULAR SPACE DETAILS

TYPE OF SURFACE SEAL: Concrete

TYPE OF ANNULAR SEALANT: Bentonite Chips

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

TYPE OF BENTONITE SEAL - GRANULAR (PELLET) SLURRY (CIRCLE ONE)

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

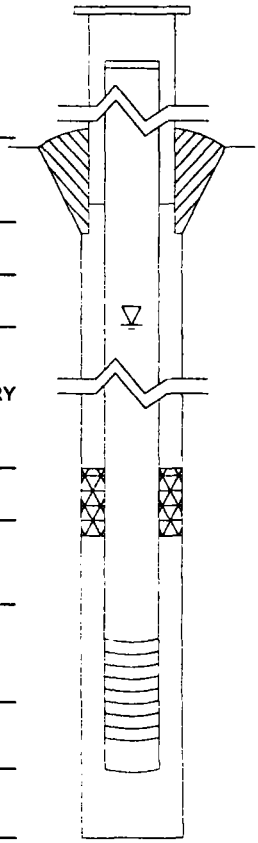
TYPE OF SAND PACK: Quartz (UNIMIN FilterSil)

GRAIN SIZE: #5 (SIEVE SIZE)

INSTALLATION METHOD: Gravity/Tremmie

TYPE OF BACKFILL MATERIAL: None (IF APPLICABLE)

INSTALLATION METHOD: NA



ELEVATIONS (MSL)*	DEPTHS (BGS) (.01 ft)	
		TOP OF PROTECTIVE CASING
414.67	-2.85	TOP OF RISER PIPE
411.82	0.00	GROUND SURFACE
410.82	1.00	TOP OF ANNULAR SEALANT
400.23	11.59	STATIC WATER LEVEL (AFTER COMPLETION)
410.82	1.00	TOP OF SEAL
407.82	4.00	TOP OF SANDPACK
406.62	5.20	TOP OF SCREEN
391.62	20.20	BOTTOM OF SCREEN
390.82	21.00	BOTTOM OF WELL
390.82	21.00	BOTTOM OF BOREHOLE

* REFERENCED TO A NATIONAL GEODETIC VERTICAL DATUM

WELL CONSTRUCTION MATERIALS (CIRCLE ONE)

PROTECTIVE CASING	SS304	(SS316)	PTFE	PVC	OTHER:
RISER PIPE ABOVE W.T.	SS304	(SS316)	PTFE	PVC	OTHER:
RISER PIPE BELOW W.T.	SS304	(SS316)	PTFE	PVC	OTHER:
SCREEN	SS304	(SS316)	PTFE	PVC	OTHER:

CASING MEASUREMENTS

DIAMETER OF BOREHOLE	(in)	8.25
ID OF RISER PIPE	(in)	2
PROTECTIVE CASING LENGTH	(ft)	7
RISER PIPE LENGTH	(ft)	8.1
BOTTOM OF SCREEN TO END CAP	(ft)	0
SCREEN LENGTH (1st SLOT TO LAST SLOT)	(ft)	15
TOTAL LENGTH OF CASING	(ft)	30.1
SCREEN SLOT SIZE **	(in)	0.01

**HAND-SLOTTED WELL SCREENS ARE UNACCEPTABLE

(941014)

Illinois Environmental Protection Agency — Well Completion Report

SITE #: _____ COUNTY: Williamson WELL #: 33MWC-45

SITE NAME: Crab Orchard National Wildlife Refuge BOREHOLE #: 33MWC-45

STATE PLANE COORDINATE: X 371677.8 Y 785202.8 (or) LATITUDE ___ ° ___ ' ___ " LONGITUDE ___ ° ___ ' ___ "

SURVEYED BY: Shawnee Surveying ILL REGISTRATION #: 3085

DRILLING CONTRACTOR: MATECO, Inc. DRILLER: Bob Dreyer

CONSULTING FIRM: RMT, Inc. GEOLOGIST: M. Westover

DRILLING METHOD: 4 1/4" HSA DRILLING FLUIDS (TYPE): None

LOGGED BY: M. Westover-RMT, Inc. DATE STARTED: 10/10/00 DATE FINISHED: 10/10/00

REPORT FORM COMPLETED BY: RMT, Inc. DATE: 1/30/01

ANNULAR SPACE DETAILS

TYPE OF SURFACE SEAL: Concrete

TYPE OF ANNULAR SEALANT: Bentonite Chips

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

TYPE OF BENTONITE SEAL - GRANULAR PELLET SLURRY (CIRCLE ONE)

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

TYPE OF SAND PACK: Quartz (UNIMIN FilterSil)

GRAIN SIZE: #5 (SIEVE SIZE)

INSTALLATION METHOD: Gravity/Tremmie

TYPE OF BACKFILL MATERIAL: None (IF APPLICABLE)

INSTALLATION METHOD: NA

ELEVATIONS (MSL)*	DEPTHS (BGS)	(.01 ft)
		TOP OF PROTECTIVE CASING
413.95	-2.48	TOP OF RISER PIPE
411.47	0.00	GROUND SURFACE
410.47	1.00	TOP OF ANNULAR SEALANT
399.07	12.40	STATIC WATER LEVEL (AFTER COMPLETION)
410.47	1.00	TOP OF SEAL
380.47	31.00	TOP OF SANDPACK
378.67	32.80	TOP OF SCREEN
373.67	37.80	BOTTOM OF SCREEN
365.47	46.00	BOTTOM OF WELL
362.97	48.50	BOTTOM OF BOREHOLE

* REFERENCED TO A NATIONAL GEODETIC VERTICAL DATUM

WELL CONSTRUCTION MATERIALS (CIRCLE ONE)

PROTECTIVE CASING	SS304	SS316	PTFE	PVC	OTHER
RISER PIPE ABOVE W.T.	SS304	SS316	PTFE	PVC	OTHER
RISER PIPE BELOW W.T.	SS304	SS316	PTFE	PVC	OTHER
SCREEN	SS304	SS316	PTFE	PVC	OTHER

CASING MEASUREMENTS

DIAMETER OF BOREHOLE	(in)	8.25
ID OF RISER PIPE	(in)	2
PROTECTIVE CASING LENGTH	(ft)	7
RISER PIPE LENGTH	(ft)	35.3
BOTTOM OF SCREEN TO END CAP	(ft)	0
SCREEN LENGTH (1st SLOT TO LAST SLOT)	(ft)	5
TOTAL LENGTH OF CASING	(ft)	40.3
SCREEN SLOT SIZE **	(in)	0.01

**HAND-SLOTTED WELL SCREENS ARE UNACCEPTABLE

(941014)

Illinois Environmental Protection Agency — Well Completion Report

SITE #: _____ COUNTY: Williamson WELL #: 33MWC-46

SITE NAME: Crab Orchard National Wildlife Refuge BOREHOLE #: 33MWC-46

STATE PLANE COORDINATE: X 373608.7 Y 787291.1 (or) LATITUDE ___° ___' ___" LONGITUDE ___° ___' ___"

SURVEYED BY: Shawnee Surveying ILL. REGISTRATION #: 3085

DRILLING CONTRACTOR: MATECO, Inc. DRILLER: Bob Dreyer

CONSULTING FIRM: RMT, Inc. GEOLOGIST: M. Westover

DRILLING METHOD: 4 1/4" HSA DRILLING FLUIDS (TYPE): None

LOGGED BY: M. Westover-RMT, Inc. DATE STARTED: 10/13/00 DATE FINISHED: 10/13/00

REPORT FORM COMPLETED BY: RMT, Inc. DATE: 1/30/01

ANNULAR SPACE DETAILS

TYPE OF SURFACE SEAL: Concrete

TYPE OF ANNULAR SEALANT: Bentonite Chips

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

TYPE OF BENTONITE SEAL - GRANULAR [PELLET] SLURRY (CIRCLE ONE)

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

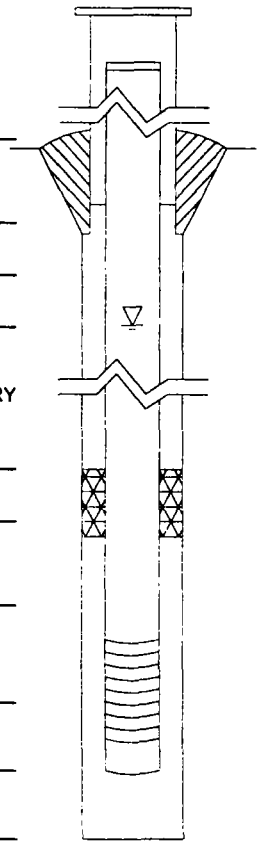
TYPE OF SAND PACK: Quartz (UNIMIN FilterSil)

GRAIN SIZE: #5 (SIEVE SIZE)

INSTALLATION METHOD: Gravity/Tremmie

TYPE OF BACKFILL MATERIAL: None (IF APPLICABLE)

INSTALLATION METHOD: NA



ELEVATIONS (MSL)*	DEPTHS (BGS) (.01 ft)	
		TOP OF PROTECTIVE CASING
419.84	-2.19	TOP OF RISER PIPE
417.65	0.00	GROUND SURFACE
416.65	1.00	TOP OF ANNULAR SEALANT
404.80	12.85	STATIC WATER LEVEL (AFTER COMPLETION)
416.65	1.00	TOP OF SEAL
413.65	4.00	TOP OF SANDPACK
412.65	5.00	TOP OF SCREEN
397.65	20.00	BOTTOM OF SCREEN
397.35	20.30	BOTTOM OF WELL
397.35	20.30	BOTTOM OF BOREHOLE

* REFERENCED TO A NATIONAL GEODETIC VERTICAL DATUM

WELL CONSTRUCTION MATERIALS (CIRCLE ONE)

PROTECTIVE CASING	SS304	[SS316]	PTFE	PVC	OTHER:
RISER PIPE ABOVE W.T.	SS304	[SS316]	PTFE	PVC	OTHER:
RISER PIPE BELOW W.T.	SS304	[SS316]	PTFE	PVC	OTHER:
SCREEN	SS304	[SS316]	PTFE	PVC	OTHER:

CASING MEASUREMENTS

DIAMETER OF BOREHOLE	(in)	8.25
ID OF RISER PIPE	(in)	2
PROTECTIVE CASING LENGTH	(ft)	5
RISER PIPE LENGTH	(ft)	7.2
BOTTOM OF SCREEN TO END CAP	(ft)	0
SCREEN LENGTH (1st SLOT TO LAST SLOT)	(ft)	15
TOTAL LENGTH OF CASING	(ft)	27.2
SCREEN SLOT SIZE **	(in)	0.01

**HAND-SLOTTED WELL SCREENS ARE UNACCEPTABLE

(941014)

Illinois Environmental Protection Agency — Well Completion Report

SITE #: _____ COUNTY: Williamson WELL #: 33MWC-47

SITE NAME: Crab Orchard National Wildlife Refuge BOREHOLE #: 33MWC-47

STATE PLANE COORDINATE: X 373606.3 Y 787289.9 (or) LATITUDE ___ ° ___ ' ___ " LONGITUDE ___ ° ___ ' ___ "

SURVEYED BY: Shawnee Surveying ILL REGISTRATION #: 3085

DRILLING CONTRACTOR: MATECO, Inc. DRILLER: Bob Dreyer

CONSULTING FIRM: RMT, Inc. GEOLOGIST: M. Westover

DRILLING METHOD: 4 1/4" HSA DRILLING FLUIDS (TYPE): None

LOGGED BY: M. Westover-RMT, Inc. DATE STARTED: 10/13/00 DATE FINISHED: 10/13/00

REPORT FORM COMPLETED BY: RMT, Inc. DATE: 1/30/01

ANNULAR SPACE DETAILS

TYPE OF SURFACE SEAL: Concrete

TYPE OF ANNULAR SEALANT: Bentonite Chips

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

TYPE OF BENTONITE SEAL - GRANULAR PELLET SLURRY (CIRCLE ONE)

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

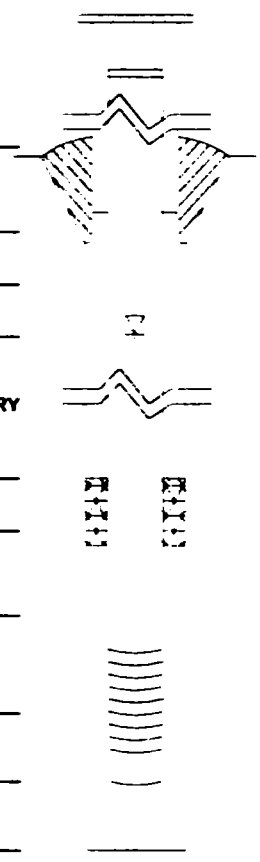
TYPE OF SAND PACK: Quartz (UNIMIN FilterSil)

GRAIN SIZE: #5 (SIEVE SIZE)

INSTALLATION METHOD: Gravity/Tremmie

TYPE OF BACKFILL MATERIAL: None (IF APPLICABLE)

INSTALLATION METHOD: NA



	ELEVATIONS (MSL)*	DEPTHS (BGS) (.01 ft)
TOP OF PROTECTIVE CASING		
TOP OF RISER PIPE	419.78	-2.09
GROUND SURFACE	417.69	0.00
TOP OF ANNULAR SEALANT	416.69	1.00
STATIC WATER LEVEL (AFTER COMPLETION)	405.94	11.75
TOP OF SEAL	416.69	1.00
TOP OF SANDPACK	390.69	27.00
TOP OF SCREEN	388.89	28.80
BOTTOM OF SCREEN	383.89	33.80
BOTTOM OF WELL	383.49	34.20
BOTTOM OF BOREHOLE	381.19	36.50

* REFERENCED TO A NATIONAL GEODETIC VERTICAL DATUM

WELL CONSTRUCTION MATERIALS (CIRCLE ONE)

PROTECTIVE CASING	SS304	SS316	PTFE	PVC	OTHER
RISER PIPE ABOVE W.T.	SS304	SS316	PTFE	PVC	OTHER
RISER PIPE BELOW W.T.	SS304	SS316	PTFE	PVC	OTHER
SCREEN	SS304	SS316	PTFE	PVC	OTHER

CASING MEASUREMENTS

DIAMETER OF BOREHOLE	(in)	8.25
ID OF RISER PIPE	(in)	2
PROTECTIVE CASING LENGTH	(ft)	7
RISER PIPE LENGTH	(ft)	30.9
BOTTOM OF SCREEN TO END CAP	(ft)	0
SCREEN LENGTH (1st SLOT TO LAST SLOT)	(ft)	5
TOTAL LENGTH OF CASING	(ft)	35.9
SCREEN SLOT SIZE **	(in)	0.01

**HAND-SLOTTED WELL SCREENS ARE UNACCEPTABLE

(9410/14)

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Illinois Environmental Protection Agency — Well Completion Report

SITE #: _____ COUNTY: Williamson WELL #: 33MWC-48

SITE NAME: Crab Orchard National Wildlife Refuge BOREHOLE #: 33MWC-48

STATE PLANE COORDINATE: X 373531.8 Y 786830.5 (or) LATITUDE ___° ___' ___" LONGITUDE ___° ___' ___"

SURVEYED BY: Shawnee Surveying ILL. REGISTRATION #: 3085

DRILLING CONTRACTOR: MATECO, Inc. DRILLER: Bob Dreyer

CONSULTING FIRM: RMT, Inc. GEOLOGIST: M. Westover

DRILLING METHOD: 4 1/4" HSA DRILLING FLUIDS (TYPE): None

LOGGED BY: M. Westover-RMT, Inc. DATE STARTED: 10/14/00 DATE FINISHED: 10/14/00

REPORT FORM COMPLETED BY: RMT, Inc. DATE: 1/30/01

ANNULAR SPACE DETAILS

TYPE OF SURFACE SEAL: Concrete

TYPE OF ANNULAR SEALANT: Bentonite Chips

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

TYPE OF BENTONITE SEAL - GRANULAR (PELLET) SLURRY (CIRCLE ONE)

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

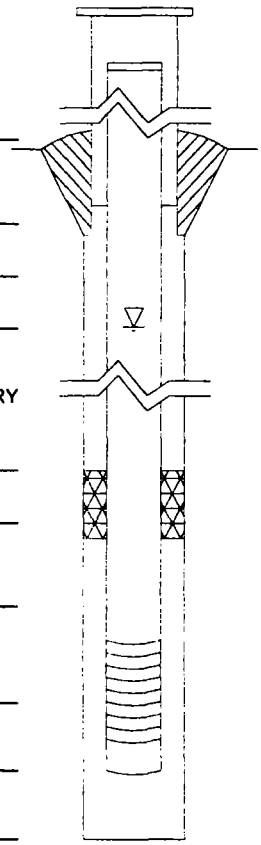
TYPE OF SAND PACK: Quartz (UNIMIN FilterSil)

GRAIN SIZE: #5 (SIEVE SIZE)

INSTALLATION METHOD: Gravity/Tremmie

TYPE OF BACKFILL MATERIAL: None (IF APPLICABLE)

INSTALLATION METHOD: NA



ELEVATIONS (MSL)*	DEPTHS (BGS) (.01 ft)	
		TOP OF PROTECTIVE CASING
423.55	-3.05	TOP OF RISER PIPE
420.50	0.00	GROUND SURFACE
419.50	1.00	TOP OF ANNULAR SEALANT
405.70	14.80	STATIC WATER LEVEL (AFTER COMPLETION)
419.50	1.00	TOP OF SEAL
416.50	4.00	TOP OF SANDPACK
415.50	5.00	TOP OF SCREEN
400.50	20.00	BOTTOM OF SCREEN
400.00	20.50	BOTTOM OF WELL
400.00	20.50	BOTTOM OF BOREHOLE

* REFERENCED TO A NATIONAL GEODETIC VERTICAL DATUM

WELL CONSTRUCTION MATERIALS (CIRCLE ONE)

PROTECTIVE CASING	SS304	(SS316)	PTFE	PVC	OTHER:
RISER PIPE ABOVE W.T.	SS304	(SS316)	PTFE	PVC	OTHER:
RISER PIPE BELOW W.T.	SS304	(SS316)	PTFE	PVC	OTHER:
SCREEN	SS304	(SS316)	PTFE	PVC	OTHER:

CASING MEASUREMENTS

DIAMETER OF BOREHOLE	(in)	8.25
ID OF RISER PIPE	(in)	2
PROTECTIVE CASING LENGTH	(ft)	5
RISER PIPE LENGTH	(ft)	8.1
BOTTOM OF SCREEN TO END CAP	(ft)	0
SCREEN LENGTH (1st SLOT TO LAST SLOT)	(ft)	15
TOTAL LENGTH OF CASING	(ft)	23.1
SCREEN SLOT SIZE **	(in)	0.01

**HAND-SLOTTED WELL SCREENS ARE UNACCEPTABLE

(941014)

Illinois Environmental Protection Agency — Well Completion Report

SITE #: _____ COUNTY: Williamson WELL #: 33MWC-49

SITE NAME: Crab Orchard National Wildlife Refuge BOREHOLE #: 33MWC-49

STATE PLANE COORDINATE X 373535.5 Y 786826.9 (or) LATITUDE ___ ° ___ ' ___ " LONGITUDE ___ ° ___ ' ___ "

SURVEYED BY: Shawnee Surveying ILL. REGISTRATION #: 3085

DRILLING CONTRACTOR: MATECO, Inc. DRILLER: Bob Dreyer

CONSULTING FIRM: RMT, Inc. GEOLOGIST: M. Westover

DRILLING METHOD: 4 1/4" HSA DRILLING FLUIDS (TYPE): None

LOGGED BY: M. Westover-RMT, Inc. DATE STARTED: 10/14/00 DATE FINISHED: 10/14/00

REPORT FORM COMPLETED BY: RMT, Inc. DATE: 1/30/01

ANNULAR SPACE DETAILS

TYPE OF SURFACE SEAL: Concrete

TYPE OF ANNULAR SEALANT: Bentonite Chips

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

TYPE OF BENTONITE SEAL - GRANULAR PELLET SLURRY (CIRCLE ONE)

INSTALLATION METHOD: Gravity/Tremmie

SETTING TIME: NA

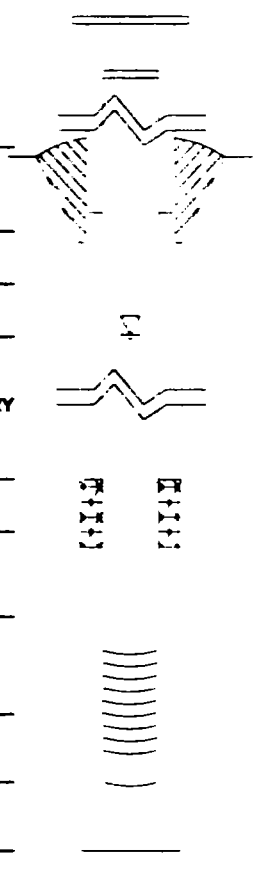
TYPE OF SAND PACK: Quartz (UNIMIN FilterSil)

GRAIN SIZE: #5 (SIEVE SIZE)

INSTALLATION METHOD: Gravity/Tremmie

TYPE OF BACKFILL MATERIAL: None (IF APPLICABLE)

INSTALLATION METHOD: NA



ELEVATIONS (MSL)*	DEPTHS (BGS)	(.01 ft)
		TOP OF PROTECTIVE CASING
423.48	-3.04	TOP OF RISER PIPE
420.44	0.00	GROUND SURFACE
419.44	1.00	TOP OF ANNULAR SEALANT
405.34	15.10	STATIC WATER LEVEL (AFTER COMPLETION)
419.44	1.00	TOP OF SEAL
394.44	26.00	TOP OF SANDPACK
391.34	29.10	TOP OF SCREEN
386.34	34.10	BOTTOM OF SCREEN
384.44	36.00	BOTTOM OF WELL
382.44	38.00	BOTTOM OF BOREHOLE

* REFERENCED TO A NATIONAL GEODETIC VERTICAL DATUM

WELL CONSTRUCTION MATERIALS (CIRCLE ONE)

PROTECTIVE CASING	SS304	SS316	PTFE	PVC	OTHER
RISER PIPE ABOVE W.T.	SS304	SS316	PTFE	PVC	OTHER
RISER PIPE BELOW W.T.	SS304	SS316	PTFE	PVC	OTHER
SCREEN	SS304	SS316	PTFE	PVC	OTHER

CASING MEASUREMENTS

DIAMETER OF BOREHOLE	(in)	8.25
ID OF RISER PIPE	(in)	2
PROTECTIVE CASING LENGTH	(ft)	7
RISER PIPE LENGTH	(ft)	32.1
BOTTOM OF SCREEN TO END CAP	(ft)	0
SCREEN LENGTH (1st SLOT TO LAST SLOT)	(ft)	5
TOTAL LENGTH OF CASING	(ft)	37.1
SCREEN SLOT SIZE **	(in)	0.01

**HAND-SLOTTED WELL SCREENS ARE UNACCEPTABLE

(941014)

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Appendix C
Surveying Data for Monitoring Wells, Geoprobe® Borings, and Staff Gauges

Post-PDW Fieldwork Survey Data
Crab Orchard NWR, Marion, IL
RMT Project No. 4781.06
October 25, 2000
Surveyor: Shawnee Surveying & Consulting, Inc., Vienna, IL (Mitch Clark / Mitch Speed)
Instrument used: Javad GPS system (RTK)

CAUTION: The elevation data shown below is likely to be 0.7 - 1.2 feet below elevation data surveyed prior to 2000 by other consultants, which is now considered obsolete.

RMT point reference	Elevation, ft (see note)	Northing	Easting	Shawnee reference number	Remarks/Notes
33MWC-01 GND	428.17	370581.9	787784.3	955	
33MWC-01 TOC	430.88	370581.4	787786.3	956	
33MWC-02 GND	421.54	372012.5	787848.2	925	
33MWC-02 TOC	423.87	372015.2	787850.0	926	
33MWC-03 GND	426.31	371559.7	786494.0	951	
33MWC-03 TOC	428.40	371558.3	786495.7	952	
33MWC-05 GND	420.95	373304.7	785512.8	943	
33MWC-05 TOC	423.39	373307.0	785512.5	944	
33MWC-06 GND	418.48	--	--	931	
33MWC-06 TOC	420.86	374547.2	785837.8	932	
33MWC-07 GND	421.21	--	--	--	
33MWC-07 TOC	424.00	374000.2	786399.2	--	
33MWC-08 GND	413.84	374815.0	786153.8	929	
33MWC-08 TOC	416.46	374814.4	786151.5	930	
33MWC-09 BM	431.72	374285.7	787250.8	842	
33MWC-09 TOC	434.29	374284.5	787249.8	841	
33MWC-10 GND	422.73	372583.9	787369.6	927	
33MWC-10 TOC	425.40	372585.0	787367.8	928	
33MWC-11 GND	422.43	370881.1	786552.5	953	
33MWC-11 TOC	424.94	370879.0	786550.6	954	
33MWC-12 GND	426.33	371709.5	786255.4	945	
33MWC-12 TOC	428.86	371711.4	786253.6	946	
33MWC-13 GND	426.91	371381.7	787486.2	873	
33MWC-13 TOC	428.94	371380.3	787486.0	874	
33MWC-14 GND	426.11	371602.9	787326.1	961	
33MWC-14 TOC	428.74	371603.6	787324.0	962	
33MWC-15 GND	414.60	373112.7	787896.2	921	
33MWC-15 TOC	416.76	373114.7	787897.9	922	
33MWC-16 BM	421.37	374097.6	786264.7	780	
33MWC-16 TOC	423.38	374096.5	786264.3	781	
33MWC-17 GND	414.87	374290.6	787478.2	908	
33MWC-17 TOC	417.67	374288.1	787477.7	907	
33MWC-18 GND	405.55	374567.0	787315.1	913	
33MWC-18 TOC	408.21	374568.0	787313.8	914	
33MWC-19 GND	405.72	374772.3	787151.9	915	
33MWC-19 TOC	408.59	374772.8	787149.9	916	
33MWC-20 GND	414.78	374802.5	786824.8	917	
33MWC-20 TOC	417.80	374805.8	786824.5	918	
33MWC-21 BM	421.41	374012.4	786376.2	776	

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33MWC-21 TOC	424.04	374011.5	786377.8	777	
33MWC-22 BM	421.46	374003.2	786381.1	778	
33MWC-22 TOC	424.23	374002.5	786382.4	779	
33MWC-23 GND	420.71	373995.4	786389.2	937	
33MWC-23 TOC	423.52	373994.5	786387.8	938	
33MWC-24 GND	426.62	371399.0	787481.4	875	
33MWC-24 TOC	428.72	371398.2	787482.7	876	
33MWC-27 GND	430.28	374305.1	787254.2	905	
33MWC-27 TOC	433.29	374304.2	787252.5	906	
33MWC-28 GND	430.38	374297.8	787258.8	904	
33MWC-28 TOC	433.44	374296.3	787256.8	903	
33MWC-29 BM	431.22	374288.6	787261.7	843	
33MWC-29 TOC	433.11	374287.3	787261.6	844	
33MWC-30 BM	406.46	375161.9	786005.5	810	
33MWC-30 TOC	408.78	375162.6	786004.3	811	
33MWC-31 GND	405.34	375163.0	785991.9	936	
33MWC-31 TOC	408.69	375161.5	785994.1	935	
33MWC-32 GND	405.54	375157.9	785985.8	933	
33MWC-32 TOC	408.79	375160.3	785984.6	934	
33MWC-33 GND	425.57	371751.8	786215.2	947	
33MWC-33 TOC	428.50	371754.4	786216.3	948	
33MWC-35 GND	425.64	371738.6	786195.9	949	
33MWC-35 TOC	428.76	371741.2	786195.2	950	
33MWC-36 GND	419.91	371968.8	787972.3	923	
33MWC-36 TOC	423.05	371966.9	787971.3	924	
33MWC-39 GND	413.28	374526.9	787541.0	909	
33MWC-39 TOC	416.02	374525.1	787542.0	910	
33MWC-41 GND	413.10	374547.6	787537.7	912	
33MWC-41 TOC	416.15	374545.5	787537.9	911	
33MWC-42 TOC	412.99	374372.2	787924.5	849	
33MWC-42 TOC	410.05	374372.4	787923.8	850	
33MWC-43 GND	409.97	374369.8	787920.8	847	
33MWC-43 TOC	412.54	374370.4	787921.2	848	
33MWC-44 GND	411.82	371682.9	785201.6	862	
33MWC-44 TOC	414.67	371682.5	785201.9	863	
33MWC-45 GND	411.47	371677.7	785202.1	865	
33MWC-45 TOC	413.95	371677.8	785202.8	864	
33MWC-46 GND	417.65	373608.4	787291.5	855	
33MWC-46 TOC	419.84	373608.7	787291.1	854	
33MWC-47 GND	417.69	373606.1	787289.8	852	
33MWC-47 TOC	419.78	373606.3	787289.9	853	
33MWC-48 GND	420.50	373531.5	786831.2	858	
33MWC-48 TOC	423.55	373531.8	786830.5	859	
33MWC-49 GND	420.44	373535.3	786828.2	861	
33MWC-49 TOC	423.48	373535.5	786826.9	860	
STAFF GAUGE 1	416.40	373399.8	786979.2	857	SG-1 @ 3.33 ft mark
STAFF GAUGE 2	413.34	373906.6	787270.0	851	SG-2 @ 3.33 ft mark
STAFF GAUGE 3	407.16	375259.2	785973.5	812	SG-3 @ 3.33 ft mark
STAFF GAUGE 4	410.65	371561.3	784981.9	866	SG-4 @ 3.33 ft mark
STAFF GAUGE 5	416.20	371442.2	786145.3	867	SG-5 @ 3.33 ft mark
STAFF GAUGE 6	408.69	374547.3	787324.5	845	SG-6 @ 3.33 ft mark
STAFF GAUGE 7	408.11	374344.8	787781.5	846	SG-7 @ 3.33 ft mark

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STAFF GAUGE 8	413.06	373145.6	787842.5	856	SG-8 @ 3.33 ft mark
MPE-UC GND	420.69	374063.1	786276.6	788	I-1-23 MPE-UC
MPE-UC TOC	423.35	374062.5	786275.9	787	I-1-23 MPE-UC
MPE-US GND	420.70	374063.0	786271.2	789	I-1-23 MPE-US
MPE-US TOC	423.62	374062.4	786270.7	790	I-1-23 MPE-US
MPE-UC1 GND	431.86	374164.7	787165.7	826	REPOSITORY MPE-UC1
MPE-UC1 TOC	434.58	374164.1	787165.2	827	REPOSITORY MPE-UC1
MPE-UC2 GND	431.65	374171.0	787156.0	830	REPOSITORY MPE-UC2
MPE-UC2 TOC	434.60	374170.5	787155.0	831	REPOSITORY MPE-UC2
MPE-US GND	431.82	374167.5	787161.0	829	REPOSITORY MPE-US
MPE-US TOC	434.49	374166.7	787160.7	828	REPOSITORY MPE-US
SVE GND	426.81	371370.3	787466.8	872	I-1-2 SVE
SVE TOC	429.47	371371.1	787466.5	871	I-1-2 SVE
SVE GND	420.85	374062.2	786281.5	785	I-1-23 SVE
SVE TOC	423.86	374061.5	786281.3	786	I-1-23 SVE
MP1A TOC	434.26	374169.8	787162.8	839	@ REPOSITORY
MP1B TOC	434.29	374166.5	787167.8	838	@ REPOSITORY
MP1C TOC	434.27	374173.3	787157.7	840	@ REPOSITORY
MP2A TOC	434.11	374160.5	787156.4	836	@ REPOSITORY
MP2B TOC	434.08	374157.4	787161.1	837	@ REPOSITORY
MP2C TOC	434.14	374163.7	787150.9	835	@ REPOSITORY
MP3A TOC	434.08	374174.4	787148.4	833	@ REPOSITORY
MP3B TOC	434.17	374171.6	787152.8	832	@ REPOSITORY
MP3C TOC	433.92	374178.1	787142.9	834	@ REPOSITORY
MP1A TOC	423.14	374065.1	786281.9	797	@ I-1-23
MP1B TOC	423.22	374066.2	786276.5	798	@ I-1-23
MP1C TOC	423.28	374065.8	786270.9	799	@ I-1-23
MP2A TOC	423.35	374054.7	786280.6	796	@ I-1-23
MP2B TOC	423.56	374054.9	786275.2	795	@ I-1-23
MP2C TOC	423.38	374055.0	786270.5	794	@ I-1-23
MP3A TOC	423.21	374063.1	786267.4	791	@ I-1-23
MP3B TOC	423.29	374062.8	786262.0	792	@ I-1-23
MP3C TOC	423.48	374063.2	786256.4	793	@ I-1-23
MP1 TOC	429.11	371373.2	787470.0	869	@ I-1-2
MP2 TOC	429.53	371368.2	787460.3	870	@ I-1-2
MP3 TOC	429.16	371358.8	787473.4	868	@ I-1-2
SB100	427.26	371402.6	787413.4	613	
SB101	426.51	371457.7	787406.1	614	
SB102	426.68	371349.4	787470.0	610	
SB103	426.20	371395.3	787458.7	611	
SB104	426.21	371367.9	787488.4	609	
SB105	425.97	371419.0	787454.9	612	
SB106	425.64	371346.1	787517.7	605	
SB107	426.28	371390.1	787517.5	608	
SB108	426.22	371347.3	787579.1	607	
SB109	426.44	371503.8	787636.8	615	
SB110	426.43	371600.8	787336.1	617	
SB111	425.64	371692.4	787438.8	622	
SB112	424.18	371772.5	787461.4	624	
SB113	425.89	371672.4	787421.7	621	
SB114	424.54	371743.7	787459.7	623	
SB115	423.77	371771.5	787432.2	625	

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SB116	425.41	371691.9	787379.7	620	
SB117	424.74	371753.5	787309.9	627	
SB118	423.32	371873.2	787389.9	630	
SB119	426.71	371546.3	787344.6	616	
SB120	427.17	371320.6	787467.6	604	
SB121	427.17	371686.7	787256.3	619	
SB122	426.37	371321.8	787552.6	606	
SB123	426.23	371305.1	787522.7	602	
SB124	426.69	371288.1	787484.0	603	
SB125	426.98	371344.0	787338.2	645	
SB126	424.01	371726.0	787397.8	626	
SB127	423.88	371751.0	787355.5	628	
SB128	424.82	371708.2	787346.6	634	
SB129	425.72	371674.1	787331.3	618	
SB130	426.00	371773.5	787261.4	643	
SB131	423.66	371802.2	787399.0	629	
SB132	426.72	371562.8	787212.3	644	
SB133	426.57	371244.8	787522.2	600	
SB134	426.73	371175.3	787553.3	601	
SB200	422.17	373963.5	786455.0	660	
SB201	421.57	373973.6	786430.1	661	
SB202	421.71	373998.6	786415.7	663	
SB203	421.00	373981.8	786402.3	662	
SB204	420.80	373996.4	786380.1	665	
SB205	420.64	374022.0	786326.7	653	
SB206	420.55	374004.7	786345.6	654	
SB207	420.54	373961.0	786360.2	657	
SB208	420.21	373996.1	786330.9	655	
SB209	420.68	373984.3	786314.6	656	
SB210	420.98	373926.5	786351.8	658	
SB211	420.90	374110.7	786279.2	649	
SB212	420.51	374066.0	786285.2	650	
SB213	420.69	374101.6	786260.4	647	
SB214	420.97	374123.4	786246.1	648	
SB215	422.42	374030.4	786407.3	664	
SB216	421.22	373945.5	786419.3	659	
SB217	420.74	374068.8	786259.4	651	
SB218	420.91	374043.0	786232.2	652	
SB300	420.25	373410.9	786756.0	686	
SB301	421.20	373446.8	786861.1	681	
SB302	425.71	373506.5	786827.4	682	
SB303	420.25	373550.0	786799.1	683	
SB304	421.16	373493.0	786726.5	684	
SB305	415.55	373338.8	786897.1	687	
SB306	422.30	373426.6	786670.5	685	
SB307	413.79	373419.6	786994.7	689	
SB308	413.28	373469.4	787022.9	688	
SB400	415.04	374340.3	786828.9	692	
SB401	415.60	374281.8	786880.8	691	
SB402	415.76	374248.9	786923.5	690	
SB403	428.87	374352.2	786971.3	695	
SB404	415.68	374201.8	786970.4	693	

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SB405	432.04	374464.3	787046.8	698	
SB406	429.77	374294.8	787042.0	694	
SB407	432.87	374373.2	787119.8	699	
SB408	430.99	374378.6	787188.2	701	
SB409	432.47	374313.1	787174.9	702	
SB410	432.72	374265.4	787173.2	707	
SB411	431.68	374168.8	787153.8	713	
SB412	432.09	374199.8	787185.9	708	
SB413	431.74	374310.2	787204.6	703	
SB414	432.10	374266.0	787216.8	706	
SB415	432.17	374213.2	787214.7	709	
SB416	431.22	374287.1	787243.7	704	
SB417	426.96	374131.0	787337.3	711	
SB418	431.38	374158.6	787245.1	710	
SB419	430.88	374103.7	787149.0	714	
SB420	430.55	374418.5	787155.7	700	
SB421	430.44	374191.4	787102.8	712	
SB422	431.16	374368.3	787035.6	697	
SB423	430.35	374425.6	786945.3	696	
SB500	411.34	373817.5	787269.1	715	
SB502	415.02	373604.2	787170.9	717	
SB503	411.36	373742.3	787191.6	716	
SB504	415.00	373596.3	787225.7	718	
SB505	416.56	373464.6	787175.2	719	
SB506	413.88	373580.1	787098.1	720	
BM	421.35	374097.5	786264.6	646	
12IN WTR S	426.68	371348.6	787624.0	638	
32-063 GND	414.35	373856.1	787091.7	919	
32-063 TOC	417.88	373854.4	787092.6	920	
33-340 GND	423.57	373826.2	786403.5	939	
33-340 TOC	425.86	373824.5	786402.3	940	
33-341 GND	423.50	371803.9	787355.3	963	
33-341 TOC	428.16	371803.5	787356.9	964	
33-342 GND	427.28	371167.7	787156.1	959	
33-342 TOC	431.69	371168.0	787154.5	960	
BERM COR	415.06	375251.2	786248.2	815	
BERM COR	416.09	375252.2	786697.6	819	
BERM COR	417.12	375016.8	786690.7	820	
BERM COR	416.16	375005.2	786254.5	821	
BLDG COR 1	419.04	373857.7	787394.4	736	
BLDG COR 1	419.88	373708.6	787373.2	737	
BLDG COR 1	420.28	373694.0	787473.6	738	
BLDG COR 2	417.09	373925.9	787404.9	721	
BLDG COR 2	416.43	374076.0	787426.0	722	
BLDG COR 2	416.41	374060.9	787526.2	735	
BM 432.13	431.14	374297.7	787257.0	705	
CANOPY BLDG COR	419.70	373492.1	787583.0	760	
CANOPY BLDG COR	419.51	373703.7	787577.2	762	
CANOPY BLDG COR	419.57	373705.4	787677.6	966	
COR CONCRT PAD	423.13	373439.1	787500.3	750	
COR CONCRT PAD	423.10	373418.1	787506.4	751	
COR CONCRT PAD	423.13	373421.0	787515.8	752	

COR CONCRT PAD	423.08	373407.9	787519.9	753	
COR CONCRT PAD	423.07	373420.3	787562.8	754	
COR CONCRT PAD	423.17	373454.4	787552.4	755	
COR CONCRT PAD	422.35	373404.2	787551.0	756	
COR CONCRT PAD	422.36	373401.6	787541.9	757	
COR CONCRT PAD	422.90	373412.7	787538.1	758	
COR CONCRT PAD	422.80	373415.5	787547.4	759	
DECON PAD COR	421.57	373615.6	787393.1	739	
DECON PAD COR	421.59	373604.2	787366.0	740	
DECON PAD COR	421.79	373558.7	787384.8	741	
DELTA	420.97	373465.6	786907.2	775	
DRAIN	420.12	373538.0	787360.5	744	
EDGE TREE	418.65	374685.5	785927.7	804	
EDGE TREE	414.04	374805.6	785837.7	805	
EDGE TREE	407.25	375079.9	785810.0	808	
EDGE TREE	406.15	375182.9	785847.6	809	
ELEC BOX	420.23	373540.6	787358.7	743	
FENCE PWR LINE	422.26	374085.4	786173.3	782	
FIRE HYDRANT	423.07	373937.1	786081.1	676	
FIRE HYDRANT	422.36	373451.0	787451.4	748	
FIRE HYDRANT	426.53	371431.8	787488.6	877	
FIRE VALVE 2	426.23	371441.1	787550.2	641	
FIRE VALVE 3	426.59	371446.9	787558.8	642	
GATE POST	421.78	374139.8	786262.5	783	
GATE POST	421.97	374151.1	786279.5	784	
GND	409.07	375196.9	786467.2	818	
LIGHT POLE	420.61	373530.3	787365.1	746	
LIGHT POLE	419.09	373381.4	787661.1	763	
LIGHT POLE	421.10	373359.2	787585.3	764	
LIGHT POLE	421.73	373336.9	787508.4	765	
LIGHT POLE	421.99	373262.3	787570.0	766	
LIGHT POLE	422.49	373219.1	787479.0	768	
LIGHT POLE	422.43	373262.3	787450.7	769	
LIGHT POLE	421.62	373383.1	787379.1	770	
LIGHT POLE	420.25	373461.9	787332.8	772	
MAN HOLE	422.61	374099.3	786356.2	679	
MAN HOLE	423.20	374201.8	785975.1	680	
MAN HOLE	420.72	373488.0	787383.3	745	
N TEE 12IN WTR	422.98	371816.6	787355.9	633	
NE CRNR CAGE 1	423.36	373896.6	786426.9	666	transformer cage
NE CRNR CAGE 2	423.21	373865.4	786307.7	671	transformer cage
NE CRNR CAGE 3	422.98	373937.4	786111.3	675	transformer cage
NE QUAD 1	405.93	374312.3	787702.9	731	phyto soil sample
NE QUAD 2	405.61	374387.9	787676.3	730	phyto soil sample
NE QUAD 3	405.45	374487.8	787654.1	729	phyto soil sample
NW CRNR CAGE 1	423.87	373888.4	786411.0	669	transformer cage
NW QUAD 1	409.20	374279.1	787443.1	726	phyto soil sample
NW QUAD 2	409.95	374347.5	787430.8	727	phyto soil sample
NW QUAD 3	408.04	374402.8	787397.0	728	phyto soil sample
PHONE BOX	422.45	373354.5	787387.5	771	
PIPE	422.12	373456.4	787455.3	749	
PIPE STUB 1	425.81	371675.1	787418.2	636	

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PIPE STUB 2	426.32	371679.0	787426.8	637	
PIPE STUB 3	426.35	371457.9	787541.0	639	
PIPE STUB 4	426.45	371462.5	787550.2	640	
PP	421.88	373904.9	786353.9	670	
PP	422.15	373939.5	786253.3	677	
PP	422.07	373979.9	786232.1	678	
PP TRANS	418.76	373610.8	787334.0	742	
PWR TRANS	422.06	373477.8	787382.9	747	
PWR TRANS	423.43	373213.7	787483.2	767	
SE CRNR CAGE 1	424.15	373878.4	786436.7	667	transformer cage
SE CRNR CAGE 2	423.45	373848.1	786317.2	672	transformer cage
SE CRNR CAGE 3	423.25	373896.9	786133.1	673	transformer cage
SE QUAD 1	406.50	374090.3	787745.4	734	phyto soil sample
SE QUAD 2	406.25	374162.0	787747.2	733	phyto soil sample
SE QUAD 3	405.70	374259.7	787721.8	732	phyto soil sample
SMALL BLDG COR	419.97	373660.1	787375.8	774	
SW CRNR CAGE 1	424.06	373869.8	786421.4	668	transformer cage
SW CRNR CAGE 3	423.63	373887.6	786118.3	674	transformer cage
SW QUAD 1	410.70	374064.1	787390.5	723	phyto soil sample
SW QUAD 2	409.90	374149.4	787414.8	724	phyto soil sample
SW QUAD 3	409.64	374210.6	787431.3	725	phyto soil sample
TOE	409.26	375243.3	786468.3	817	
TOP BERM	414.24	375260.0	786468.0	816	
TREE LN	407.91	375139.3	786054.0	823	
TREE LN	410.51	374974.9	786022.0	824	
TREE LN	415.56	374856.6	786155.2	825	
VALVE NEST	426.88	371677.1	787436.7	635	
W SWALE NE1	414.39	375244.7	786189.1	822	phyto soil sample
W SWALE NE2	409.97	375180.2	786145.8	813	phyto soil sample
W SWALE NE3	410.39	375131.2	786111.7	814	phyto soil sample
W SWALE NW1	408.49	374982.7	785945.4	807	phyto soil sample
W SWALE NW2	411.61	374886.0	785949.3	806	phyto soil sample
W SWALE NW3	414.59	374794.8	785950.0	803	phyto soil sample
W SWALE SW1	413.25	374877.9	786104.7	800	phyto soil sample
W SWALE SW2	410.09	374821.0	786082.1	801	phyto soil sample
W SWALE SW3	412.40	374754.4	786055.1	802	phyto soil sample
WATER 8IN TEE	423.73	371826.6	787374.4	632	
WATER E W	423.95	371862.0	787438.2	631	
WTR HYDRANT	421.44	373565.6	787379.2	773	

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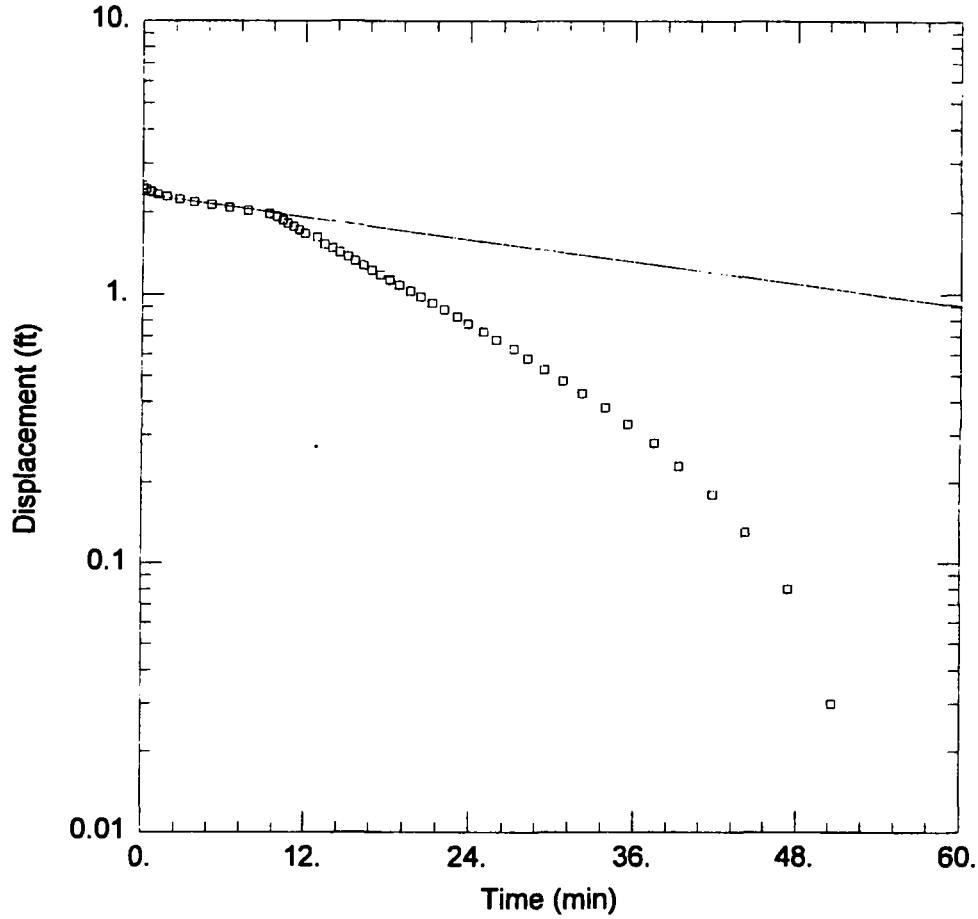
Appendix D
Slug Test Data and Hydraulic Conductivity Calculations



33MWC-42 ALT

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC42ALT.AQT
Date: 01/05/01 Time: 13:11:01

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Test Location: Marion, Illinois
Test Well: 33MWC-42
Test Date: 12/15/00

This response uses the r'c correction factor for the early time recovery (approx 0 - 10 minutes) because water level went below bottom of surface seal during approximately the same ~~[illegible]~~ time interval. As water level recovers to level above seal, r'c not used (see MWC42.AQT)

AQUIFER DATA

Saturated Thickness: 11.1 ft ✓ Anisotropy Ratio (Kz/Kr): 1. ✓

WELL DATA (33MWC-42)

Initial Displacement: 2.5 ft ok
Casing Radius: 0.083 ft ✓
Screen Length: 11.1 ft ✓
Water Column Height: 11.1 ft ✓
Wellbore Radius: 0.34 ft ✓
Gravel Pack Porosity: 0.25 ✓

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 3.234E-05 cm/sec y0 = 2.316 ft

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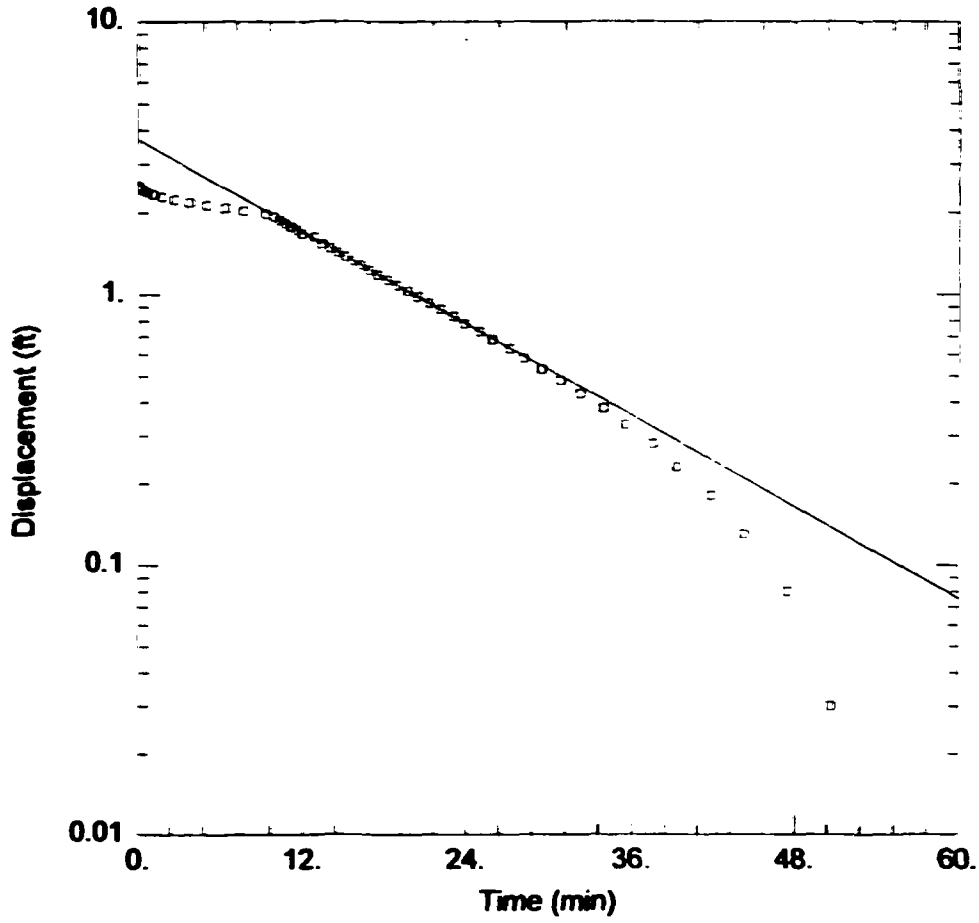
✓ TSJ 1/29/01



33MWC-42

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC42.AQT
Date: 01/05/01 Time: 13:10:53

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Test Location: Marion, Illinois
Test Well: 33MWC-42
Test Date: 12/15/00

See note on MWC42ALT.AQT

AQUIFER DATA

Saturated Thickness: 11.1 ft ✓ Anisotropy Ratio (Kz/Kr): 1. ✓

WELL DATA (33MWC-42)

Initial Displacement: 2.5 ft ok
Casing Radius: 0.083 ft ✓
Screen Length: 11.1 ft ✓
Water Column Height: 11.1 ft ✓
Wellbore Radius: 0.34 ft ✓

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
K = 2.701E-05 cm/sec y0 = 3.691 ft

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✓TSS 1/29/01

RMT INC.

SHEET ____ OF ____

744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334

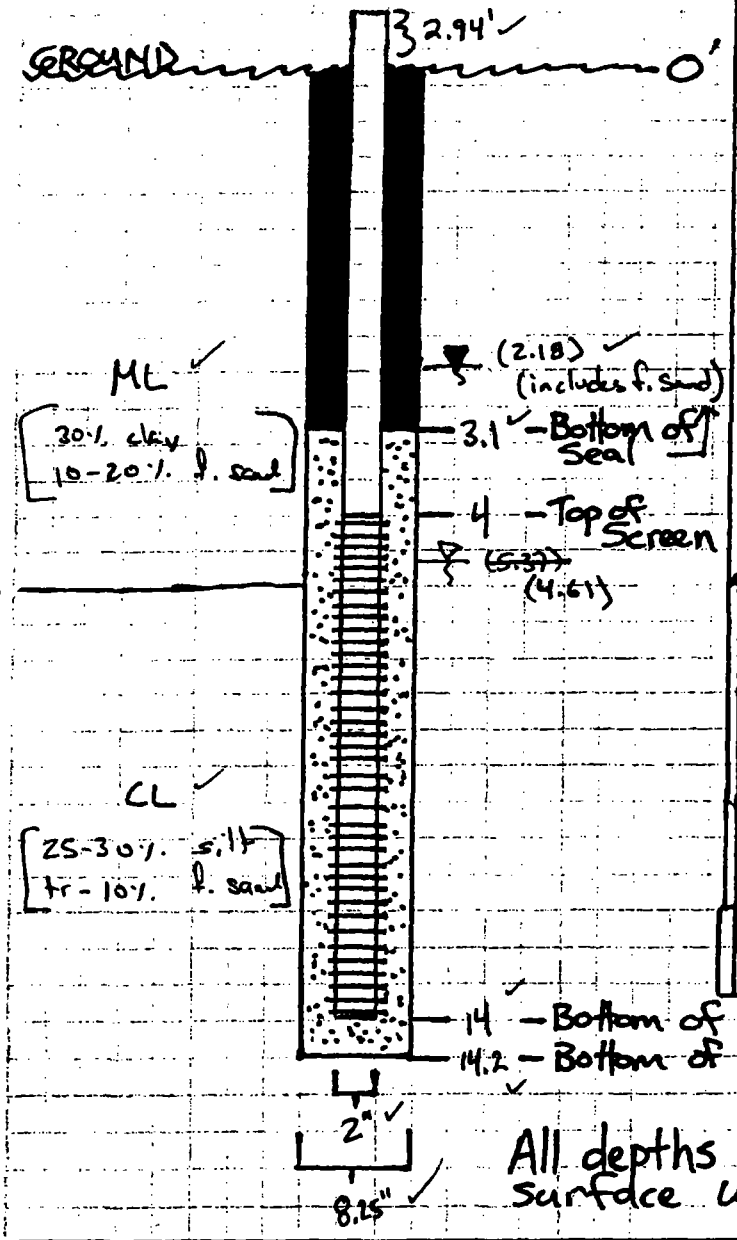
PROJECT / PROPOSAL NAME	PREPARED		CHECKED		PROJECT/PROPOSAL NO.
Crab Orchard NWR	By: MLW	Date: ~~10/4/01~~ 11/4/01	By: TBS	Date: 1/29/01	4781.07

BOUWER and RICE SINGLE-WELL RESPONSE TEST ANALYSIS

WELL NUMBER 33MWC-42

FIGURE IS NOT TO SCALE

DTW = 5.12' TOC
= 2.18' BGS



"SLUG TEST DATA" for Aqtesolv

Initial Drawdown = 2.43'

Radius of Well Casing (r_c or r'_c) = Both
0.083 0.186
see notes on Report

Radius of Well (r_w) = 0.34

Saturated Aquifer Thickness (D) = 11.1

Effective Screen Length (L) = 11.1

Static Height of Water in Well (H) = 11.1

Default for Aquitards D=H=L

r'_c correction factor used to adjust for sand pack de-watering effects.

$$r'_c = \sqrt{r_c^2 + n_e(r_w^2 - r_c^2)}$$
(0.25)

Static Water Level

All depths are in feet below ground surface unless otherwise noted.

Assumptions:

Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC42.AQT
Title: 33MWC-42
Date: 01/12/01
Time: 14:19:13

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Location: Marion, Illinois
Test Date: 12/15/00
Test Well: 33MWC-42

AQUIFER DATA

Saturated Thickness: 11.1 ft
Anisotropy Ratio (Kz/Kr): 1.

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: 33MWC-42

X Location: 0. ft
Y Location: 0. ft

No. of observations: 48

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.25	2.43	12.87	1.63	23.88	0.78
0.62	2.38	13.43	1.53	25.	0.73
1.08	2.33	14.	1.48	25.92	0.68
1.75	2.28	14.55	1.43	27.22	0.63
2.65	2.23	15.12	1.38	28.22	0.58
3.72	2.18	15.67	1.33	29.45	0.53
5.	2.13	16.32	1.28	30.82	0.48
6.33	2.08	16.92	1.23	32.22	0.43
7.68	2.03	17.55	1.18	33.88	0.38
9.27	1.98	18.23	1.13	35.52	0.33
9.85	1.93	18.93	1.08	37.35	0.28
10.3	1.88	19.72	1.03	39.33	0.23
10.65	1.83	20.45	0.98	41.8	0.18
11.12	1.78	21.27	0.93	44.25	0.13
11.55	1.73	22.15	0.88	47.43	0.08
11.97	1.68	23.08	0.83	50.65	0.03

TBS 1/29/01

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SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	2.701E-05	cm/sec
y0	3.691	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	2.701E-05	7.926E-07	cm/sec
y0	3.691	0.06188	ft

Parameter Correlations

	K	y0
K	1.00	0.74
y0	0.74	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 1.035 ft^2
Variance..... 0.02249 ft^2
Std. Deviation..... 0.15 ft
Mean ..... -0.01992 ft
No. of Residuals ... 48.
No. of Estimates ... 2

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Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC42ALT.AQT
Title: 33MWC-42 ALT
Date: 01/12/01
Time: 14:19:27

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Location: Marion, Illinois
Test Date: 12/15/00
Test Well: 33MWC-42

AQUIFER DATA

Saturated Thickness: 11.1 ft
Anisotropy Ratio (Kz/Kr): 1.

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: 33MWC-42

X Location: 0. ft
Y Location: 0. ft

No. of observations: 48

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.25	2.43	12.87	1.63	23.88	0.78
0.62	2.38	13.43	1.53	25.	0.73
1.08	2.33	14.	1.48	25.92	0.68
1.75	2.28	14.55	1.43	27.22	0.63
2.65	2.23	15.1~~1~~2	1.38	28.22	0.58
3.72	2.18	15.67	1.33	29.45	0.53
5.	2.13	16.32	1.28	30.82	0.48
6.33	2.08	16.92	1.23	32.22	0.43
7.68	2.03	17.55	1.18	33.88	0.38
9.27	1.98	18.23	1.13	35.52	0.33
9.85	1.93	18.93	1.08	37.~~53~~ 35	0.28
10.3	1.88	19.72	1.03	39.33	0.23
10.65	1.83	20.45	0.98	41.8	0.18
11.12	1.78	21.27	0.93	44.25	0.13
11.55	1.73	22.15	0.88	47.43	0.08
11.97	1.68	23.08	0.83	50.65	0.03

✓ TSS 1/29/01

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SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	3.234E-05	cm/sec
y0	2.316	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	3.234E-05	7.926E-07	cm/sec
y0	2.316	0.06188	ft

Parameter Correlations

	K	y0
K	1.00	0.74
y0	0.74	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 1.035 ft^2
Variance..... 0.02249 ft^2
Std. Deviation..... 0.15 ft
Mean ..... -0.01992 ft
No. of Residuals ... 48.
No. of Estimates ... 2

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RMT INC.

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONWR

DATE: 12/15/2000

PROJECT NUMBER: 4781.07

SAMPLER(S): TVP

WELL NUMBER: MWC 42

WELL DIAMETER: 2" SS

DTW: 5.12 + 0.00 T/~~P~~/SS/C

DTB: 16.97 + 0.00 T/~~P~~/SS/C

Water Volume Removed: 1 gallon

Depth to Bottom: 16.97

Type of Test: baildown
(slug/baildown)

Initial Time: 905 End Time: ____

(Min)	Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown	
	0/0/0	(Initial)	—	0\11\58 11.97	6.80	1.68	✓
0.25	0\0\15	7.55	2.43 ✓	0\12\52 12.87	6.75	1.63	✓
0.62	0\0\37	7.50	2.38 ✓	0\13\26 13.43	6.65	1.53	✓
1.08	0\1\05	7.45	2.33 ✓	0\14\00 14	6.60	1.48	✓
1.75	0\1\45	7.40	2.28 ✓	0\14\33 14.55	6.55	1.43	✓
2.65	0\2\39	7.35	2.23 ✓	0\15\07 15.12	6.50	1.38	✓
3.72	0\3\43	7.30	2.18 ✓	0\15\40 15.67	6.45	1.33	✓
5	0\5\00	7.25	2.13 ✓	0\16\19 16.32	6.40	1.28	✓
6.33	0\6\20	7.20	2.08 ✓	0\16\55 16.92	6.35	1.23	✓
7.68	0\7\41	7.15	2.03 ✓	0\17\33 17.55	6.30	~~1.23~~ 1.18	✓
9.27	0\9\16	7.10	1.98 ✓	0\18\14 18.23	6.25	1.13	✓
9.85	0\9\51	7.05	1.93 ✓	0\18\56 18.93	6.20	1.08	✓
10.3	0\10\18	7.00	1.88 ✓	0\19\43 19.72	6.15	1.03	✓
10.65	0\10\39	6.95	1.83 ✓	0\20\27 20.45	6.10	0.98	✓
11.12	0\11\07	6.90	1.78 ✓	0\21\16 21.27	6.05	0.93	✓
11.55	0\11\33	6.85	1.73 ✓	0\22\04 22.15	6.00	0.88	✓

* For water table wells, remove at least one well (borehole volume):

one well/borehole volume (gallons) - $\pi\, h_{water}\, [r_w^2 + n_{sp}\,(r_b^2 - r_w^2)] \times 7.48$ gal/ft^3

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

TVP — Signed; 12/18/2000 — Date; [signature] — QC'd By; 1/15/01 — Date

RMT

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONWR

DATE: 12/15/2000

PROJECT NUMBER: 4781.07

SAMPLER(S): TJP

WELL NUMBER: MWC 42

WELL DIAMETER: 2" SS

DTW: 5.12 + 0.02 T/P/~~C~~ SS

DTB: 16.97 + 0.00 T/P/~~C~~ SS

Water Volume Removed: 1 gallon

Depth to Bottom: 16.97

Type of Test: baldown
(slug/baildown)

Initial Time: 905 End Time: ____

(min)	~~0/0/0~~	~~(initial)~~	~~—~~			
				0\47\26	5.20	0.08 ✓
23.08	0\23\05	5.95	0.83 ✓	0\50\39	5.15	0.03 ✓
23.88	0\23\53	5.90	0.78 ✓	0\54\36	5.10	(+0.02) ✓
25	0\25\00	5.85	0.73 ✓			
25.92	0\25\55	5.80	0.68 ✓			
27.22	0\27\13	5.75	0.63 ✓			
28.22	0\28\13	5.70	0.58 ✓			
29.95	0\29\27	5.65	0.53 ✓			
30.82	0\30\44	5.60	0.48 ✓			
32.02	0\32\13	5.55	0.43 ✓			
33.88 / 3\53	~~3\53~~	5.50	0.38 ✓			
35.52	0\35\31	5.45	0.33 ✓			
37.35	0\37\24	5.40	0.28 ✓			
39.33	0\39\20	5.35	0.23 ✓			
41.8	0\41\48	5.30	0.18 ✓			
44.25	0\44\15	5.25	0.13 ✓			

- For water table wells, remove at least one well (borehole volume):

  one well/borehole volume (gallons) - $\pi h_{water} [r_w^2 + n_{sp} (r_b^2 - r_w^2)] \times 7.48$ gal/ft^3

  n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

- For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

Signed: TJP Date: 12/18/2000 QC'd By: [signature] Date: 1/15/01

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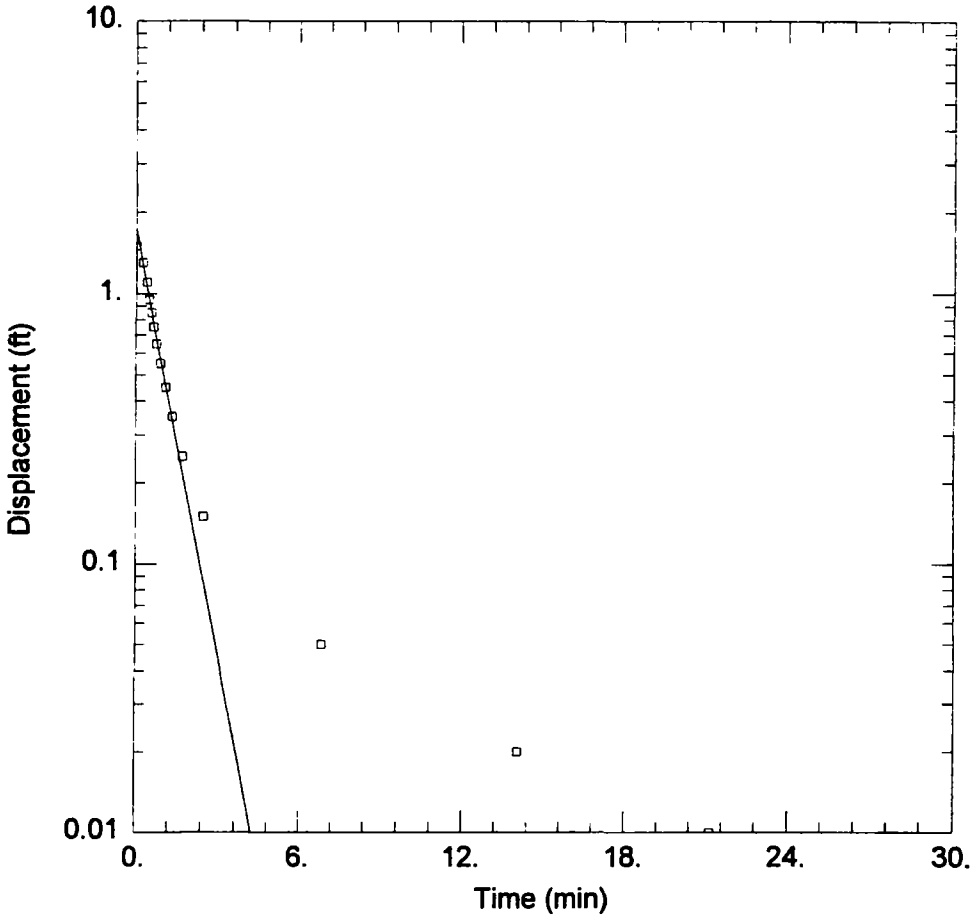

33MWC-43

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC43.AQT
Date: 01/05/01 Time: 13:11:34

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Test Location: Marion, Illinois
Test Well: 33MWC-43
Test Date: 12/15/00

AQUIFER DATA

Saturated Thickness: 2.4 ft ✓ Anisotropy Ratio (Kz/Kr): 1. ✓

WELL DATA (33MWC-43)

Initial Displacement: 1.5 ft ok Water Column Height: 2.4 ft ✓
Casing Radius: 0.083 ft ✓ Wellbore Radius: 0.34 ft ✓
Screen Length: 2.4 ft ✓

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 0.001238 cm/sec y0 = 1.735 ft

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✓TES 1/29/01

RMT INC
744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334

SHEET ____ OF ____

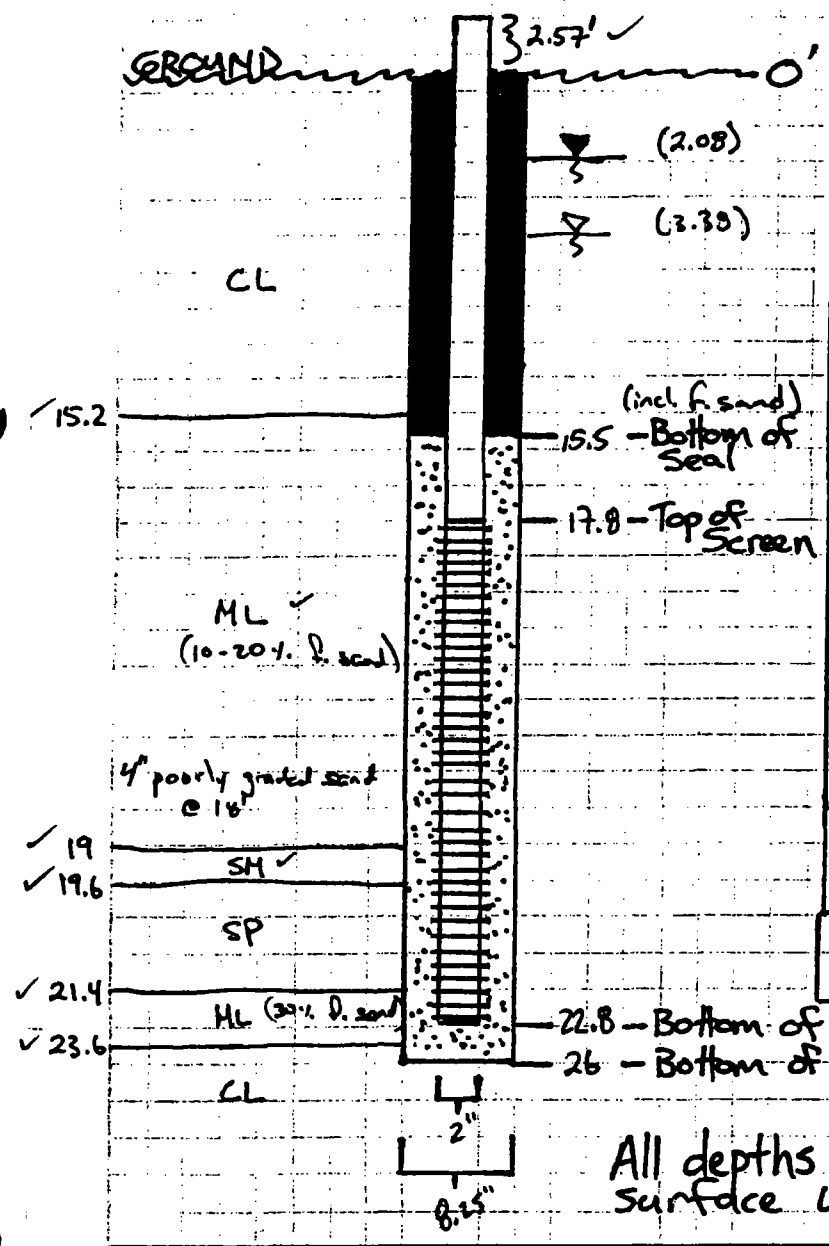
PROJECT / PROPOSAL NAME	PREPARED By	Date	CHECKED By	Date	PROJECT/PROPOSAL NO.
Crab Orchard NWR	HW	~~12/11/08~~ 1/4/09	TSS	1/29/01	4781.07

BOUWER and RICE SINGLE-WELL RESPONSE TEST ANALYSIS

WELL NUMBER 33MWC-43

FIGURE IS NOT TO SCALE

DTW = 4.65 T/SS
= 2.08' BGS



"SLUG TEST DATA" for Aqtesolv

Initial Drawdown = 1.3

Radius of Well Casing (r_c or r'_c) = 0.083
0.083 0.186

Radius of Well (r_w) = 0.34

Saturated Aquifer Thickness (D) = 2.4

Effective Screen Length (L) = 2.4

Static Height of Water in Well (H) = 2.4

Default for Aquitards D=H=L

r'_c correction factor is NOT used to adjust for sand pack de-watering effects.

$$r'_c = \sqrt{r_c^2 + n_e(r_w^2 - r_c^2)}$$

Static Water Level

All depths are in feet below ground surface unless otherwise noted.

Assumptions: SM + SP are hydraulically similar. Assume majority of recovery is accounted for by SM + SP units.

Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC43.AQT
Title: 33MWC-43
Date: 01/12/01
Time: 14:19:38

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Location: Marion, Illinois
Test Date: 12/15/00
Test Well: 33MWC-43

AQUIFER DATA

Saturated Thickness: 2.4 ft
Anisotropy Ratio (Kz/Kr): 1.

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: 33MWC-43

X Location: 0. ft
Y Location: 0. ft

No. of observations: 14

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.25	1.3	0.77	0.65	2.47	0.15
0.4	1.1	0.92	0.55	6.85	0.05
0.48	0.95	1.1	0.45	14.07	0.02
0.57	0.85	1.35	0.35	21.17	0.01
0.67	0.75	1.72	0.25		

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1/29/01

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.001238	cm/sec

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y0	1.735	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	0.001238	4.757E-05	cm/sec
y0	1.735	0.0479	ft

Parameter Correlations

	K	y0
K	1.00	0.89
y0	0.89	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 0.0122 ft^2
Variance ..... 0.001017 ft^2
Std. Deviation..... 0.03188 ft
Mean ..... 0.01002 ft
No. of Residuals ... 14.
No. of Estimates ... 2

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RMT INC.

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONWR

DATE: 12/15/2000

PROJECT NUMBER: 4781.07

SAMPLER(S): TCP

WELL NUMBER: MWC 43

WELL DIAMETER: 2" SS

DTW: 4.65 + 000 T/~~PVC~~ SS

DTB: 25.91 + 000 T/~~PVC~~ SS

Water Volume Removed: 1.5 gallons

Depth to Bottom: 25.91

Type of Test: baildown (slug/baildown)

Initial Time: 835 End Time: _____

(min)	Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
	0/0/0	(Initial)	——			
0.25	0\0\15	5.95	1.30 ✓			
0.4	0\0\24	5.75	1.10 ✓			
0.48	0\0\29	5.60	0.95 ✓			
0.57	0\0\34	5.50	0.85 ✓			
0.67	0\0\40	5.40	0.75 ✓			
0.77	0\0\46	5.30	0.65 ✓			
0.92	0\0\55	5.20	0.55 ✓			
1.1	0\1\06	5.10	0.45 ✓			
1.35	0\1\21	5.00	0.35 ✓			
1.72	0\1\43	4.90	0.25 ✓			
2.47	0\2\28	4.80	0.15 ✓			
6.85	0\6\51	4.70	0.05 ✓			
14.07	0\14\04	4.67	0.02 ✓			
21.17	0\21\10	4.66	0.01 ✓			
85	10:00am	4.63	(+0.02) ✓			

* For water table wells, remove at least one well (borehole volume):

one well/borehole volume (gallons) - $\pi\, h_{water}\, [r_w^2 + n_{sp}\,(r_b^2 - r_w^2)] \times 7.48$ gal/ft^3

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

TCP — Signed; 12/18/2000 — Date; Thomas Sheehan — QC'd By; 1/15/01 — Date

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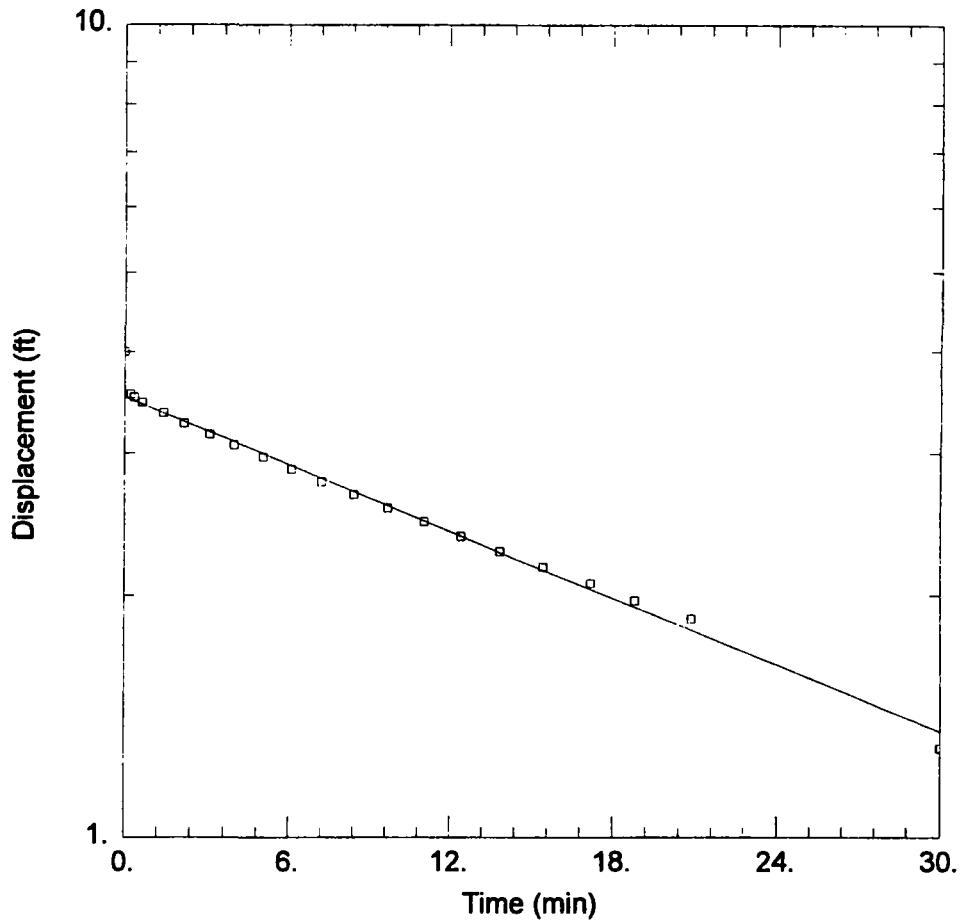


33MWC-44

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC44.AQT
Date: 01/05/01 Time: 13:13:04

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Test Location: Marion, Illinois
Test Well: 33MWC-44
Test Date: 12/14/00

AQUIFER DATA

Saturated Thickness: 17.5 ft ✓ Anisotropy Ratio (Kz/Kr): 1. ✓

WELL DATA (33MWC-44)

Initial Displacement: 4. ft ok
Casing Radius: 0.083 ft ✓
Screen Length: 17.5 ft ✓
Water Column Height: 17.5 ft ✓
Wellbore Radius: 0.34 ft ✓
Gravel Pack Porosity: 0.25 ✓

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 4.76E-05 cm/sec y0 = 3.524 ft

25

✓ TGS 1/29/01

RMT INC.
744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334

SHEET ____ OF ____

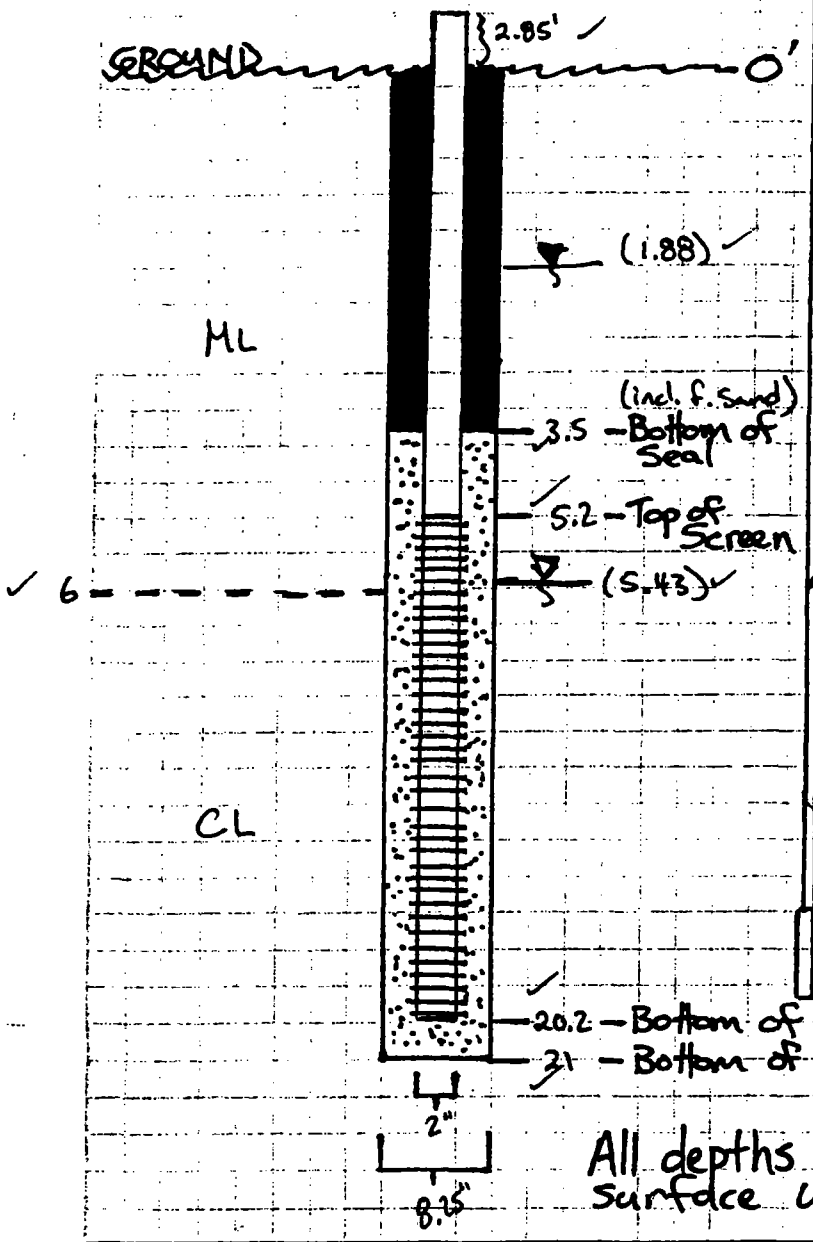
PROJECT / PROPOSAL NAME	PREPARED By:	Date	CHECKED By:	Date	PROJECT/PROPOSAL NO.
Crab Orchard NWR	HW	12/4/01	TRS	12/27/01	4781.07

BOUWER and RICE SINGLE-WELL RESPONSE TEST ANALYSIS

WELL NUMBER 33MWC-44

FIGURE IS NOT TO SCALE

DTW = 4.73' TOC
= 1.88' BGS.



"SLUG TEST DATA" for Aqtesolv

Initial Drawdown = 3.55

Radius of Well Casing = 0.186
(r_c or r'_c)
0.083 0.186

Radius of Well (r_w) = 0.34

Saturated Aquifer Thickness (D) = 17.5

Effective Screen Length (L) = 17.5

Static Height of Water in Well (H) = 17.5

Default for Aquitards D=H=L

r'_c correction factor is used to adjust for sand pack de-watering effects.

$$r'_c = \sqrt{r_c^2 + n_e(r_w^2 - r_c^2)}$$

Static Water Level

All depths are in feet below ground surface unless otherwise noted.

Assumptions:

Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC44.AQT
Title: 33MWC-44
Date: 01/12/01
Time: 14:19:53

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Location: Marion, Illinois
Test Date: 12/14/00
Test Well: 33MWC-44

AQUIFER DATA

Saturated Thickness: 17.5 ft
Anisotropy Ratio (Kz/Kr): 1.

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: 33MWC-44

X Location: 0. ft
Y Location: 0. ft

No. of observations: 20

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.22	3.55	5.05	2.97	13.88	2.27
0.35	3.52	6.12	2.87	15.47	2.17
0.65	3.47	7.25	2.77	17.22	2.07
1.43	3.37	8.45	2.67	18.83	1.97
2.17	3.27	9.72	2.57	20.88	1.87
3.1	3.17	11.08	2.47	30.	1.29
3.98	3.07	12.45	2.37		

✓TBS 1/29/01

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

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Parameter	Estimate	
K	4.76E-05	cm/sec
y0	3.524	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	4.76E-05	6.498E-07	cm/sec
y0	3.524	0.01348	ft

Parameter Correlations

	K	y0
K	1.00	0.71
y0	0.71	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 0.01983 ft^2
Variance ..... 0.001102 ft^2
Std. Deviation..... 0.03319 ft
Mean ..... 2.206E-06 ft
No. of Residuals ... 20.
No. of Estimates ... 2

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RMT INC.

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: Conwe

DATE: 12/14/2000

PROJECT NUMBER: 4781.07

SAMPLER(S): Tup

WELL NUMBER: MWC 44

WELL DIAMETER: 2" SS

DTW: 4.73 + 000 T/~~PVC~~ SS

DTB: 23.32 + 000 T/~~PVC~~ SS

Water Volume Removed: 1 gal

Depth to Bottom: 23.32

Type of Test: baildown
(slug/baildown)

Initial Time: ~~310~~ 308 pm

End Time: ____

(min)	Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
	0/0/0	(Initial)	—	0\15\28 (15.47)	6.90	2.17 ✓
0.22	0\0\13	8.28	3.55 ✓	0\17\13 (17.22)	6.80	2.07 ✓
0.35	0\0\21	8.25	3.52 ✓	0\18\50 (18.83)	6.70	1.97 ✓
0.65	0\0\39	8.20	3.47 ✓	0\20\53 (20.88)	6.60	1.87 ✓
1.43	0\1\26	8.10	3.37 ✓			
2.17	0\2\10	8.00	3.27 ✓			
3.10	0\3\06	7.90	3.17 ✓	3:38 (30)	6.02	1.29 ✓
3.98	0\4\59	~~78~~.80	3.07 ✓			
5.05	0\5\03	~~78~~.70	2.97 ✓			
6.12	0\6\07	~~78~~.60	2.87 ✓			
7.25	0\7\15	~~78~~.50	2.77 ✓			
8.45	0\8\27	~~78~~.40	2.67 ✓			
9.72	0\9\43	~~78~~.30	2.57 ✓			
11.08	0\11\05	~~78~~.20	2.47 ✓			
12.45	0\12\27	~~78~~.10	2.37 ✓			
13.89	0\~~12~~ 13\53	7.00	2.27 ✓			

* For water table wells, remove at least one well (borehole volume):

one well/borehole volume (gallons) - $\pi\ h_{water}\ [r_w^2 + n_{sp}\ (r_b^2 - r_w^2)] \times 7.48\ gal/ft^3$

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

Signed: TWR — Date: 12/18/2000 — QC'd By: [signature] — Date: 1/15/01

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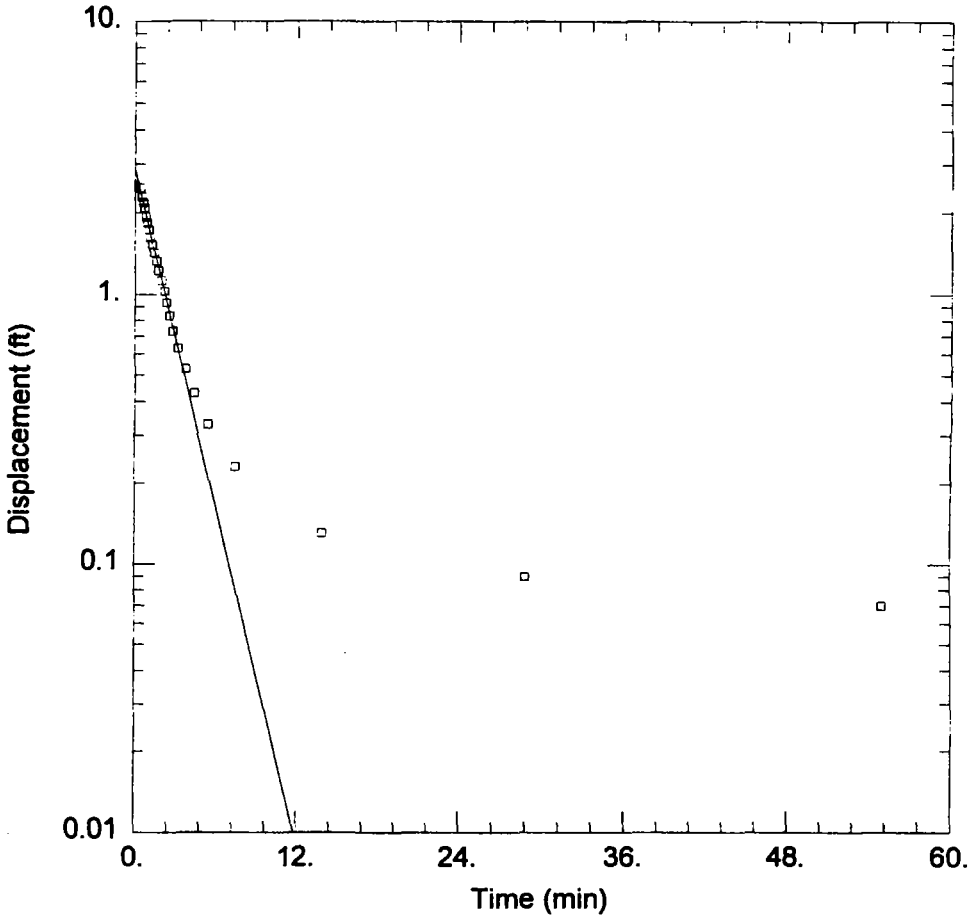


33MWC-45

Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC45.AQT
Date: 02/06/01 Time: 15:57:37

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Test Location: Marion, Illinois
Test Well: 33MWC-45
Test Date: 12/14/00

AQUIFER DATA

Saturated Thickness: 16.1 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (33MWC-45)

Initial Displacement: 2.5 ft
Casing Radius: 0.083 ft
Screen Length: 15.5 ft
Water Column Height: 8.4 ft
Wellbore Radius: 0.34 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0001233 cm/sec
y0 = 2.908 ft

TBB 2/18/01

RMT INC.

SHEET ____ OF ____

744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334

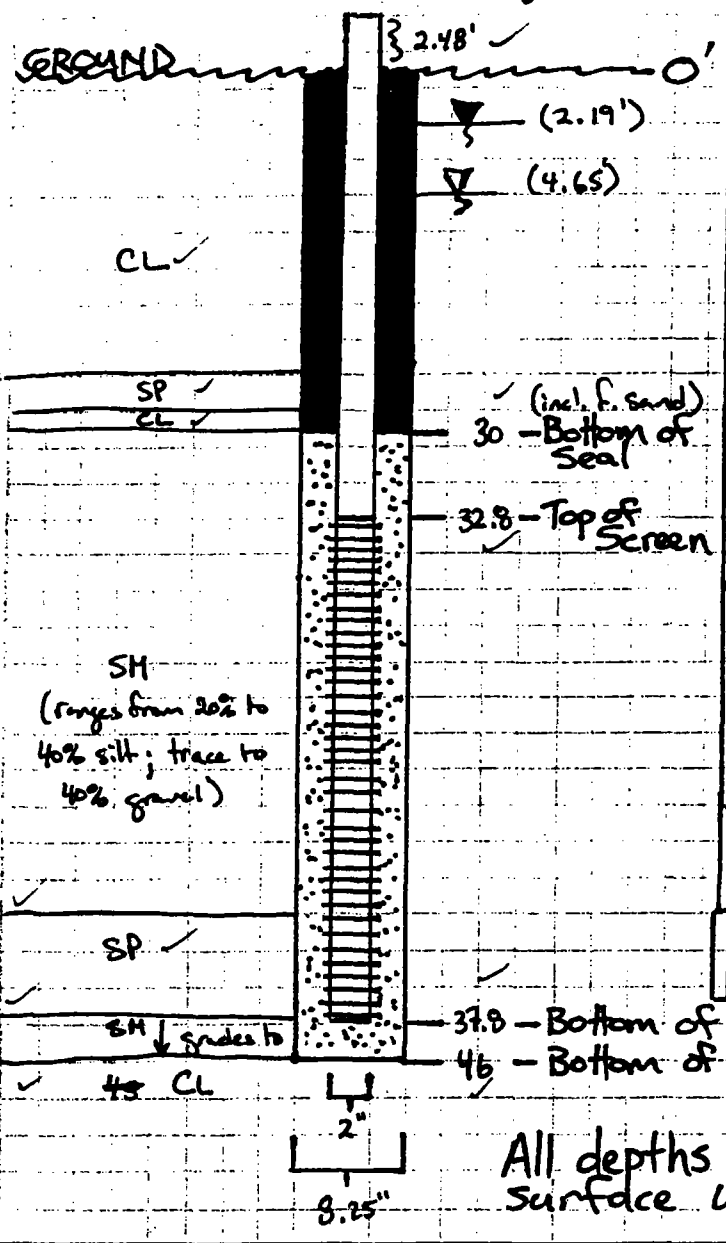
PROJECT / PROPOSAL NAME	PREPARED By:	Date:	CHECKED By:	Date:	PROJECT/PROPOSAL NO.
Crab Orchard NWR	MW	1/4/01	TJS	2/8/01	4781.07

BOUWER and RICE SINGLE-WELL RESPONSE TEST ANALYSIS

WELL NUMBER 33MWC-45

FIGURE IS NOT TO SCALE

DTW = 4.67' TOC
= 2.19' Bgs.



"SLUG TEST DATA" for Aqtesolv

Initial Drawdown = 2.46

Radius of Well Casing (r_c or r'_c) = 0.083
0.083 0.186

Radius of Well (r_w) = 0.34

Saturated Aquifer Thickness (D) = 16.1

Effective Screen Length (L) = 15.5

Static Height of Water in Well (H) = 8.4

Default for Aquitards D=H=L

r'_c correction factor is NOT used to adjust for sand pack de-watering effects.

$$r'_c = \sqrt{r_c^2 + n_e(r_w^2 - r_c^2)}$$

Static Water Level

All depths are in feet below ground surface unless otherwise noted.

Assumptions: Assume SP + SM are hydraulically similar.

Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC45.AQT
Title: 33MWC-45
Date: 02/06/01
Time: 15:57:43

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Location: Marion, Illinois
Test Date: 12/14/00
Test Well: 33MWC-45

AQUIFER DATA

Saturated Thickness: 16.1 ft
Anisotropy Ratio (Kz/Kr): 1.

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: 33MWC-45

X Location: 0. ft
Y Location: 0. ft

No. of observations: 25

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.42	2.46	1.4	1.43	3.75	0.53
0.53	2.29	1.58	1.33	4.38	0.43
0.63	2.18	1.73	1.23	5.4	0.33
0.72	2.08	1.97	1.13	7.45	0.23
0.82	1.93	2.18	1.03	13.9	0.13
0.93	1.83	2.32	0.93	28.88	0.09
1.05	1.73	2.57	0.83	55.	0.07
1.15	1.63	2.82	0.73		
1.3	1.53	3.2	0.63		

TBS
2/8/01

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

39

Estimated Parameters

Parameter	Estimate	
K	0.0003096	cm/sec
y0	2.908	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	0.0001233	3.675E-06	cm/sec
y0	2.908	0.05187	ft

Parameter Correlations

	K	y0
K	1.00	0.85
y0	0.85	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 0.09356 ft^2
Variance..... 0.004068 ft^2
Std. Deviation..... 0.06378 ft
Mean ..... 0.02106 ft
No. of Residuals ... 25.
No. of Estimates ... 2

40

RMT INC.

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: Conoco

DATE: 12/14/2000

PROJECT NUMBER: 4781.07

SAMPLER(S): TP

WELL NUMBER: MWC 45

WELL DIAMETER: 2" SS

DTW: 4.67 + 000 T/P/~~V~~C SS

DTB: 40.5 + 000 T/P/~~V~~C SS

Water Volume Removed: 1 gal

Depth to Bottom: 40.50

Type of Test: baildown
(slug/baildown)

Initial Time: 2:36 End Time: _____

5'3 TP

	Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
	0/0/0	(Initial)	——	0\2\34 (2.57)	5.50	0.83 ✓
0.42	0\0\25	7.13	2.46 ✓	0\2\49 (2.82)	5.40	0.73 ✓
0.53	0\0\32	6.96	2.29 ✓	0\3\12 (3.25)	5.30	0.63 ✓
0.63	0\0\38	6.85	2.18 ✓	0\3\45 (3.78)	5.20	0.53 ✓
0.72	0\0\43	6.75	2.08 ✓	0\4\23 (4.42)	5.10	0.43 ✓
0.82	0\0\49	6.60	1.93 ✓	0\5\24 (5.40)	5.00	0.33 ✓
0.93	0\0\56	6.50	1.83 ✓	0\7\27 (7.45)	4.90	0.23 ✓
1.05	0\1\03	6.40	1.73 ✓	0\13\54 (13.90)	4.80	0.13 ✓
1.15	0\1\09	6.30	1.63 ✓	0\28\53 (28.88)	4.76	0.09 ✓
1.30	0\1\18	6.20	1.53 ✓			
1.40	0\1\24	6.10	1.43 ✓			
1.53	0\1\35	6.00	1.33 ✓	3:31 pm	4.74	0.07 ✓
1.73	0\1\44	5.90	1.23 ✓			
1.97	0\1\58	5.80	1.13 ✓			
2.18	0\2\11	5.70	1.03 ✓			
2.32	0\2\19	~~6.60~~ 5.60 TP	0.93 ✓			

* For water table wells, remove at least one well (borehole volume):

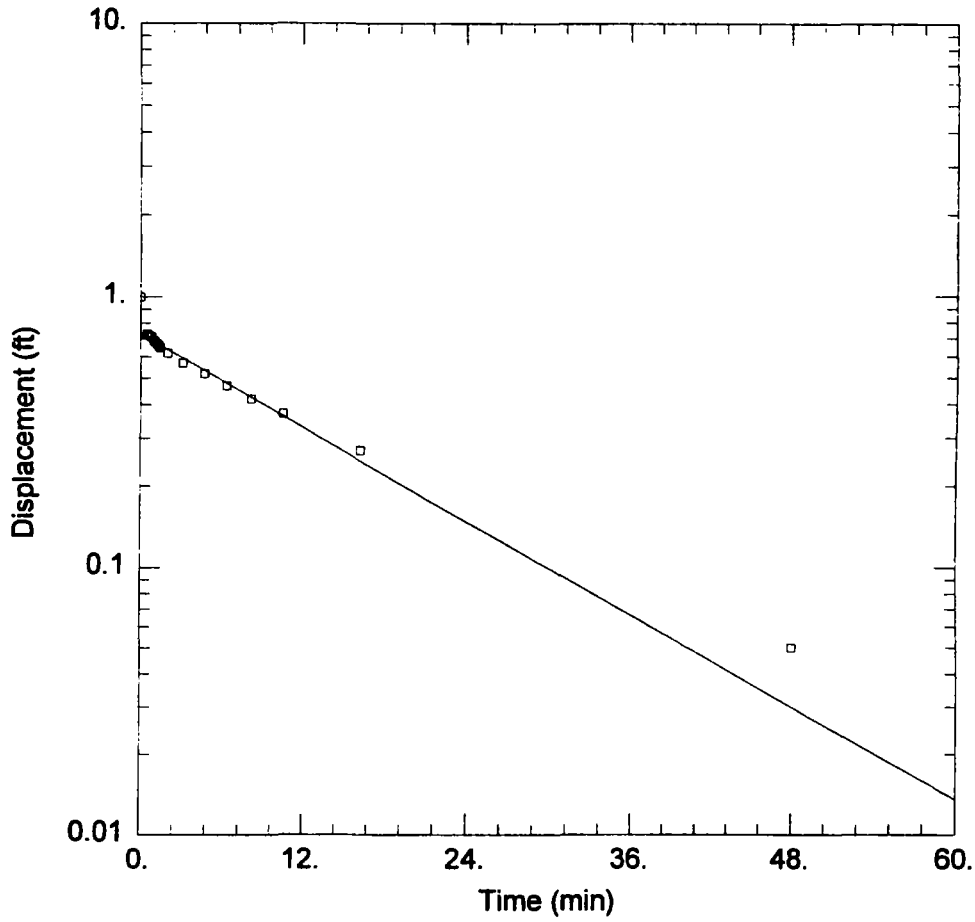
one well/borehole volume (gallons) - $\pi\, h_{water}\, [r_w^2 + n_{sp}\,(r_b^2 - r_w^2)] \times 7.48$ gal/ft^3

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

Signed: [signature] Date: 12/18/2000 QC'd By: [signature] Date: 1/15/01

41



33MWC-46

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC46.AQT
Date: 01/05/01 Time: 13:15:47

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Test Location: Marion, Illinois
Test Well: 33MWC-46
Test Date: 12/14/00

AQUIFER DATA

Saturated Thickness: 12.81 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (33MWC-46)

Initial Displacement: 1. ft ok
Casing Radius: 0.083 ft
Screen Length: 12.81 ft
Water Column Height: 12.81 ft
Wellbore Radius: 0.34 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001241 cm/sec
y0 = 0.7311 ft

45

VTS 1/29/01

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744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334

SHEET ____ OF ____

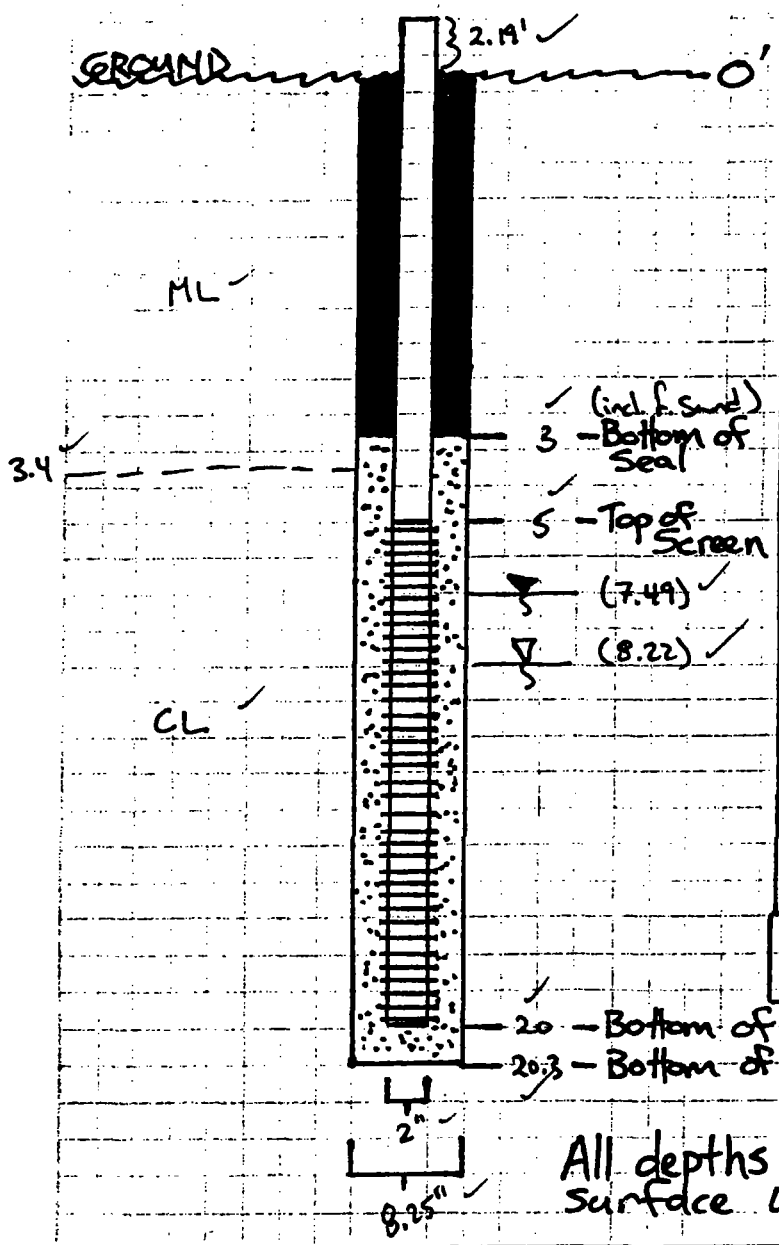
PROJECT / PROPOSAL NAME	PREPARED		CHECKED		PROJECT/PROPOSAL NO.
Crab Orchard NWR	By: MLW	Date: 12/4/01	By: JSS	Date: 1/29/01	4781.07

BOUWER and RICE SINGLE-WELL RESPONSE TEST ANALYSIS

WELL NUMBER 33MWC-46

FIGURE IS NOT TO SCALE

DTW = 9.68' TOC
= 7.49' BGS.



"SLUG TEST DATA" for Aqtesolv

Initial Drawdown = 0.73

Radius of Well Casing = 0.186
(r_c or r'_c)
0.083 0.186

Radius of Well (r_w) = 0.34

Saturated Aquifer Thickness (D) = 12.81

Effective Screen Length (L) = 12.81

Static Height of Water in Well (H) = 12.81

Default for Aquitards D=H=L

r'_c correction factor is used to adjust for sand pack de-watering effects.

$$r'_c = \sqrt{r_c^2 + n_e(r_w^2 - r_c^2)}$$

Static Water Level

All depths are in feet below ground surface unless otherwise noted.

Assumptions:

Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC46.AQT
Title: 33MWC-46
Date: 01/12/01
Time: 14:20:17

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Location: Marion, Illinois
Test Date: 12/14/00
Test Well: 33MWC-46

AQUIFER DATA

Saturated Thickness: 12.81 ft
Anisotropy Ratio (Kz/Kr): 1.

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: 33MWC-46

X Location: 0. ft
Y Location: 0. ft

No. of observations: 16

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.5	0.73	1.37	0.66	8.12	0.42
0.67	0.72	1.48	0.65	10.53	0.37
0.83	0.71	2.	0.62	16.32	0.27
1.02	0.69	3.08	0.57	48.	0.05
1.13	0.68	4.67	0.52		
1.28	0.67	6.33	0.47		

JTS 1/29/01

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate

49

K	0.0001241	cm/sec
y0	0.7311	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	0.0001241	4.932E-06	cm/sec
y0	0.7311	0.006924	ft

Parameter Correlations

	K	y0
K	1.00	0.64
y0	0.64	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 0.003976 ft^2
Variance..... 0.000284 ft^2
Std. Deviation..... 0.01685 ft
Mean ..... 0.001378 ft
No. of Residuals ... 16.
No. of Estimates ... 2

50

RMT INC.

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONWR

DATE: 12/14/2000

PROJECT NUMBER: 4781.07

SAMPLER(S): TP

WELL NUMBER: MWC 46

WELL DIAMETER: 2 ~~PVC~~ SS

DTW: 9.68 + 000 T/~~PVC~~ SS

DTB: 22.90 + 000 T/~~PVC~~ SS

Water Volume Removed: 1 gal

Depth to Bottom: 22.90

Type of Test: baildown (slug/baildown)

Initial Time: 906 am End Time: 1226

(min)	Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
	0/0/0	(Initial)	——	9:54 am (48)	9.73	0.05 ✓
0.5	0/0/30	10.41	0.73 ✓	12:26 pm (200)	9.66	(+0.02) ✓
0.67	0/0/40	10.40	0.72 ✓			
0.83	0/0/50	10.39	0.71 ✓			
1.02	0\1\01	10.37	0.69 ✓			
1.13	0\1\08	10.36	0.68 ✓			
1.28	0\1\17	10.35	0.67 ✓			
1.37	0\1\22	10.34	0.66 ✓			
1.48	0\1\29	10.33	0.65 ✓			
2	0\2\00	10.30	0.62 ✓			
3.08	0\3\05	10.25	0.57 ✓			
4.67	0\4\40	10.20	0.52 ✓			
6.33	0\6\20	10.15	0.47 ✓			
8.12	0\8\07	10.10	0.42 ✓			
10.53	0\10\32	10.05	0.37 ✓			
	~~0\ TP~~	~~10.02~~	0.27 ✓			
16.32	0\16\19	9.95				

first time could read

For water table wells, remove at least one well (borehole volume):

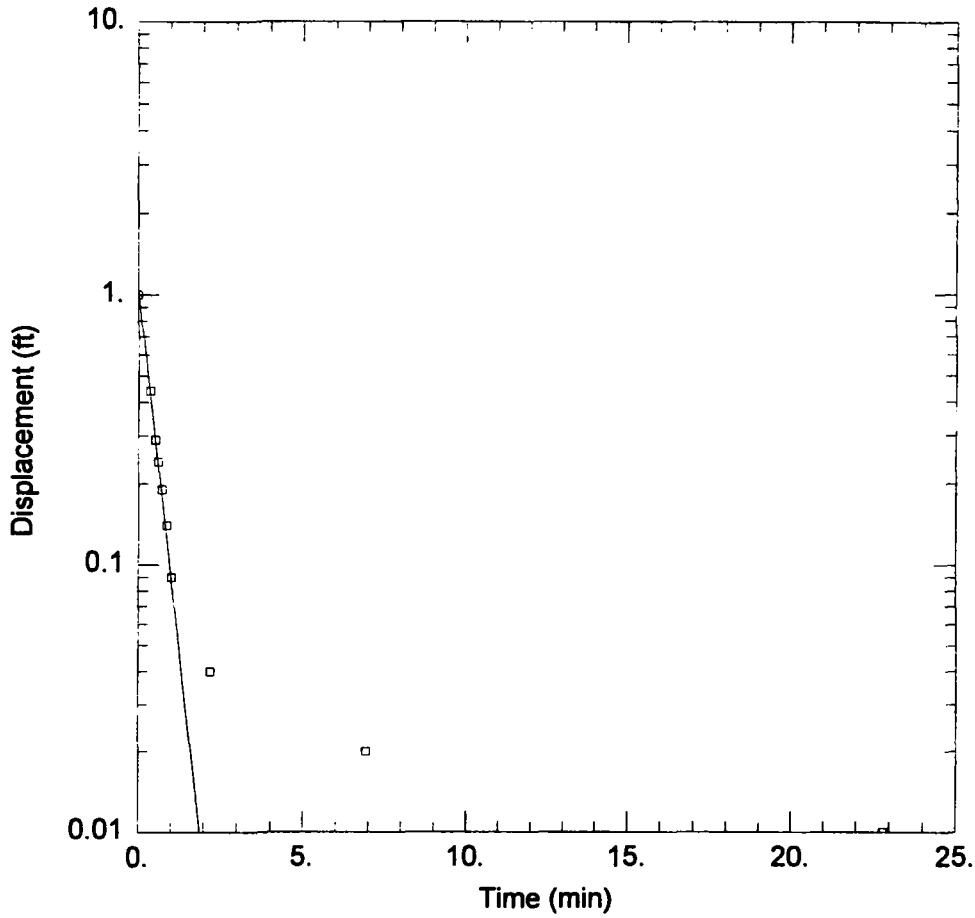
one well/borehole volume (gallons) - $\pi\ h_{water}\ [r_w^2 + n_{sp}\ (r_b^2 - r_w^2)] \times 7.48\ gal/ft^3$

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

Signed	Date	QC'd By	Date
TP	12/18/2000	Thomas Shewan	1/15/01

51



33MWC-47

Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC47.AQT
Date: 02/06/01 Time: 15:55:18

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Test Location: Marion, Illinois
Test Well: 33MWC-47
Test Date: 12/14/00

AQUIFER DATA

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

WELL DATA (33MWC-47)

Initial Displacement: 1. ft
Casing Radius: 0.083 ft
Screen Length: 7.8 ft
Water Column Height: 11. ft
Wellbore Radius: 0.34 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.001395 cm/sec
y0 = 1.042 ft

JPS 2/8/01

55

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744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334

SHEET ____ OF ____

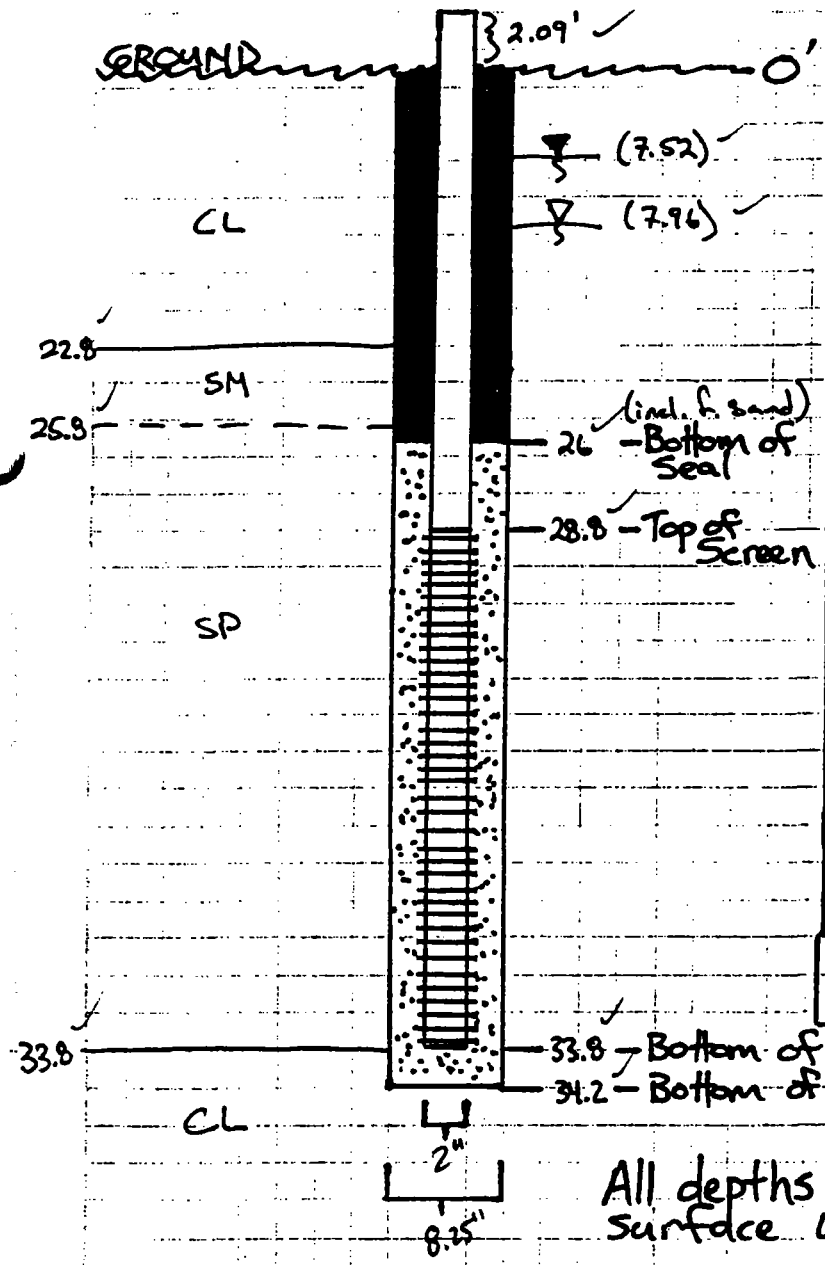
PROJECT / PROPOSAL NAME	PREPARED By:	Date:	CHECKED By:	Date:	PROJECT/PROPOSAL NO.
Crab Orchard NWR	MW	1/4/01	KS	2/8/01	4781.07

BOUWER and RICE SINGLE-WELL RESPONSE TEST ANALYSIS

WELL NUMBER 33MWC-47

FIGURE IS NOT TO SCALE

DTW = 9.61' TOC
= 7.52 BGS



"SLUG TEST DATA" for Aqtesolv

Initial Drawdown = 0.44

Radius of Well Casing (r_c or r'_c) = 0.083
0.083 0.186

Radius of Well (r_w) = 0.34

Saturated Aquifer Thickness (D) = 11

Effective Screen Length (L) = ~~8~~ 7.8

Static Height of Water in Well (H) = 11

Default for Aquitards D=H=L

r'_c correction factor IS NOT used to adjust for sand pack de-watering effects.

$$r'_c = \sqrt{r_c^2 + n_e(r_w^2 - r_c^2)}$$

Static Water Level

All depths are in feet below ground surface unless otherwise noted.

Assumptions: Assume SM + SP are hydraulically similar.

Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC47.AQT
Title: 33MWC-47
Date: 02/06/01
Time: 15:55:25

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Location: Marion, Illinois
Test Date: 12/14/00
Test Well: 33MWC-47

AQUIFER DATA

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

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: 33MWC-47

X Location: 0. ft
Y Location: 0. ft

No. of observations: 9

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.37	0.44	0.72	0.19	2.22	0.04
0.53	0.29	0.87	0.14	6.92	0.02
0.62	0.24	1.02	0.09	22.83	0.01

JTS 2/8/01

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.001395	cm/sec
y0	1.042	ft

59

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	0.0005583	0.000355	cm/sec
y0	0.7312	0.2996	ft

Parameter Correlations

	K	y0
K	1.00	0.93
y0	0.93	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 0.1452 ft^2
Variance..... 0.02074 ft^2
Std. Deviation..... 0.144 ft
Mean ..... -0.1014 ft
No. of Residuals ... 9.
No. of Estimates ... 2

60

RMT INC.

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONW 12

DATE: 12/14/2000

PROJECT NUMBER: 4781.07

SAMPLER(S): TCP

WELL NUMBER: MWC 47

WELL DIAMETER: 2" ~~PVC~~ SS

DTW: 9.61 + 000 T/~~P~~VC

DTB: 36.28 + 000 T/~~P~~VC SS

Water Volume Removed: 1 gal

Depth to Bottom: 36.28

Type of Test: baildown (slug/baildown)

Initial Time: 930 am End Time: 1228

(min)	Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
	0/0/0	(Initial)	——			
0.37	0/0/22	10.05	0.44 ✓			
0.53	0/0/32	9.90	0.29 ✓			
0.62	0/0/37	9.85	0.24 ✓			
0.72	0/0/43	9.80	0.19 ✓			
0.87	0/0/52	9.75	0.14 ✓			
1.02	1/01	9.70	0.09 ✓			
2.22	2/13	9.65	0.04 ✓			
6.92	6/55	9.63	0.02 ✓			
22.83	22/50	9.62	0.01 ✓			
178	12:28 pm	9.59	(+0.02) ✓			

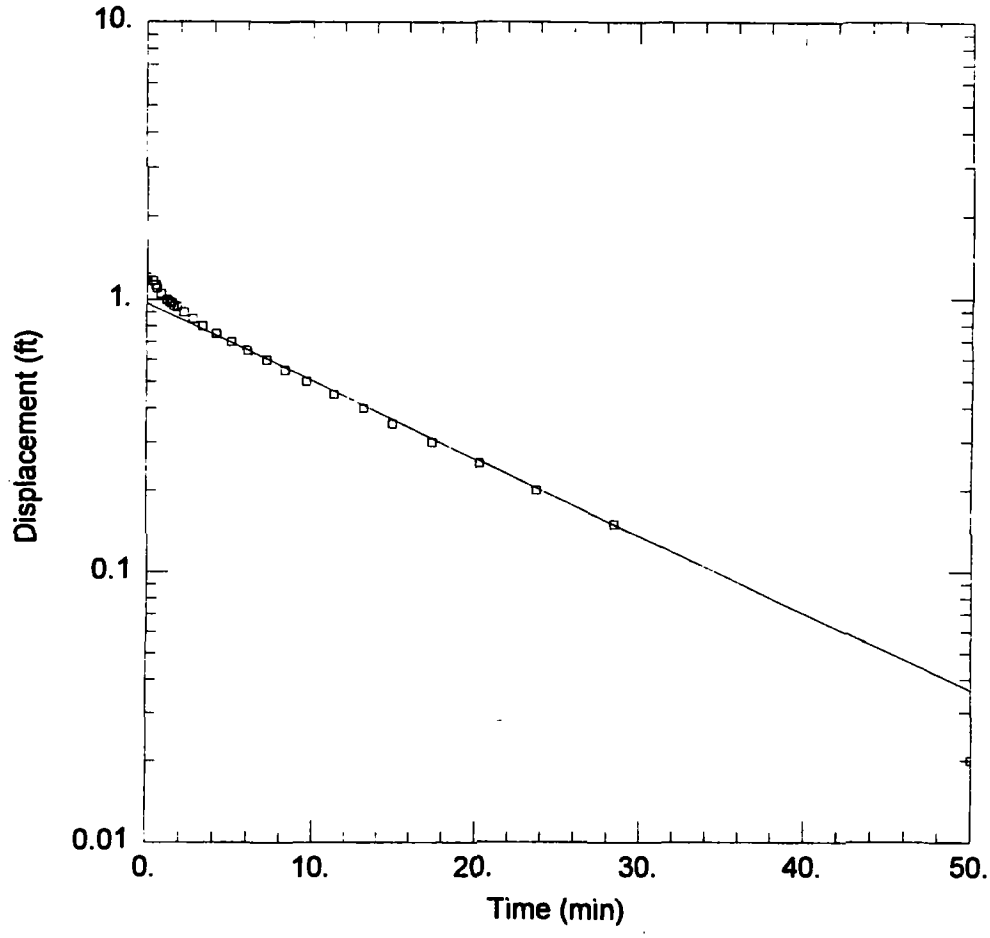
* For water table wells, remove at least one well (borehole volume):

one well/borehole volume (gallons) - $\pi\ h_{water}\ [r_w^2 + n_{sp}\ (r_b^2 - r_w^2)] \times 7.48\ gal/ft^3$

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

TCP — Signed; 12/18/2000 — Date; Thomas Sherman — QC'd By; 1/15/01 — Date



33MWC-48

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC48.AQT
Date: 01/05/01 Time: 13:17:20

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Test Location: Marion, Illinois
Test Well: 33MWC-48
Test Date: 12/14/00

AQUIFER DATA

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

WELL DATA (33MWC-48)

Initial Displacement: 1.2 ft
Casing Radius: 0.083 ft
Screen Length: 11.9 ft
Water Column Height: 11.9 ft
Wellbore Radius: 0.34 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001289 cm/sec
y0 = 0.9698 ft

65
1/29/01

RMT INC
744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334

SHEET ____ OF ____

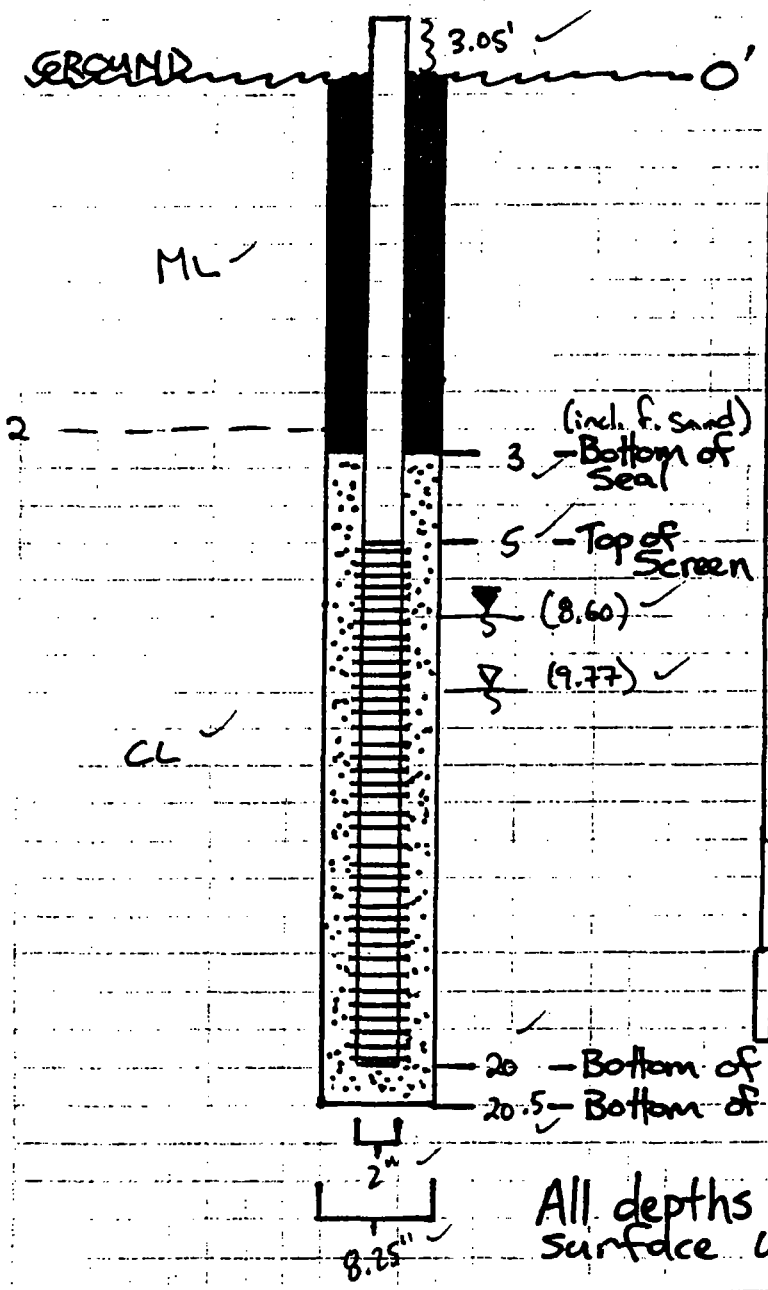
PROJECT / PROPOSAL NAME	PREPARED		CHECKED		PROJECT/PROPOSAL NO.
Crab Orchard Nwr	By: MW	Date: 1/4/01	By: RS	Date: 2/6/01	4781.07

BOUWER and RICE SINGLE-WELL RESPONSE TEST ANALYSIS

WELL NUMBER 33MWC-48

FIGURE IS NOT TO SCALE

DTW = 11.65' TOC
= 8.60 BGS



"SLUG TEST DATA" for Aqtesolv

Initial Drawdown = 1.17

Radius of Well Casing = 0.186
(r_c or r'_c)
0.083 0.186

Radius of Well (r_w) = 0.34

Saturated Aquifer Thichness (D) = 11.9

Effective Screen Length (L) = 11.9

Static Height of Water in Well (H) = 11.9

Default for Aquitards D=H=L

r'_c correction factor is used to adjust for sand pack de-watering effects.

$$r'_c = \sqrt{r_c^2 + n_e(r_w^2 - r_c^2)}$$

Static Water Level

All depths are in feet below ground surface unless otherwise noted.

Assumptions:

Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC48.AQT
Title: 33MWC-48
Date: 01/12/01
Time: 14:20:44

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Location: Marion, Illinois
Test Date: 12/14/00
Test Well: 33MWC-48

AQUIFER DATA

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

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: 33MWC-48

X Location: 0. ft
Y Location: 0. ft

No. of observations: 26

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.37	1.17	2.22	0.9	11.33	0.45
0.53	1.13	2.75	0.85	13.18	0.4
0.58	1.1	3.32	0.8	14.97	0.35
0.82	1.05	4.15	0.75	17.43	0.3
1.17	1.	5.07	0.7	20.32	0.25
1.35	0.98	6.	0.65	23.78	0.2
1.48	0.97	7.18	0.6	28.5	0.15
1.62	0.95	8.28	0.55	50.	0.02
1.8	0.94	9.62	0.5		

✓ TBS 1/29/01

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

69

Estimated Parameters

Parameter	Estimate	
K	0.0001289	cm/sec
y0	0.9698	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	0.0001289	5.625E-06	cm/sec
y0	0.9698	0.01364	ft

Parameter Correlations

	K	y0
K	1.00	0.64
y0	0.64	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 0.03182 ft^2
Variance..... 0.001326 ft^2
Std. Deviation..... 0.03641 ft
Mean ..... 0.003281 ft
No. of Residuals ... 26.
No. of Estimates ... 2

70

RMT INC.

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONWR

DATE: 12/14/2000

PROJECT NUMBER: 4781.07

SAMPLER(S): TGP

WELL NUMBER: MWC 48

WELL DIAMETER: 2" SS

DTW: 11.65 + 000 T/P/~~C~~ SS

DTB: 23.70 + 000 T/P/~~C~~ SS

Water Volume Removed:

Depth to Bottom: 23.70

Type of Test: baildown (slug/baildown)

Initial Time: 1118 End Time:

(min)	Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
	0/0/0	(Initial)	——	0\7\11 (7.18)	12.25	0.60 ✓
0.37	0\0\22	12.82	1.17 ✓	0\8\17 (8.28)	12.20	0.55 ✓
0.53	0\0\32	12.78	1.13 ✓	0\9\37 (9.62)	12.15	0.50 ✓
0.58	0\0\35	12.75	1.10 ✓	0\11\20 (11.33)	12.10	0.45 ✓
0.82	0\0\49	12.70	1.05 ✓	0\13\11 (13.18)	12.05	0.40 ✓
1.17	0\1\10	12.65	1.00 ✓	0\14\58 (14.97)	12.00	0.35 ✓
1.35	0\1\27	12.63	0.98 ✓	0\17\26 (17.43)	11.95	0.30 ✓
1.48	0\1\24	12.62	0.97 ✓	0\20\19 (20.32)	11.90	0.25 ✓
1.62	0\1\37	12.60	0.95 ✓	0\23\47 (23.78)	11.85	0.20 ✓
1.8	0\1\48	12.59	0.94 ✓	0\28\30 (28.5)	11.80	0.15 ✓
2.22	0\2\13	12.55	0.90 ✓	(50) 2:08 pm	11.67	0.02 ✓
2.75	0\2\45	12.50	0.85 ✓			
3.32	0\3\19	12.45	0.80 ✓			
4.15	0\4\09	12.40	0.75 ✓			
5.07	0\5\04	12.35	0.70 ✓			
6	0\6\00	12.30	0.65 ✓			

* For water table wells, remove at least one well (borehole volume):

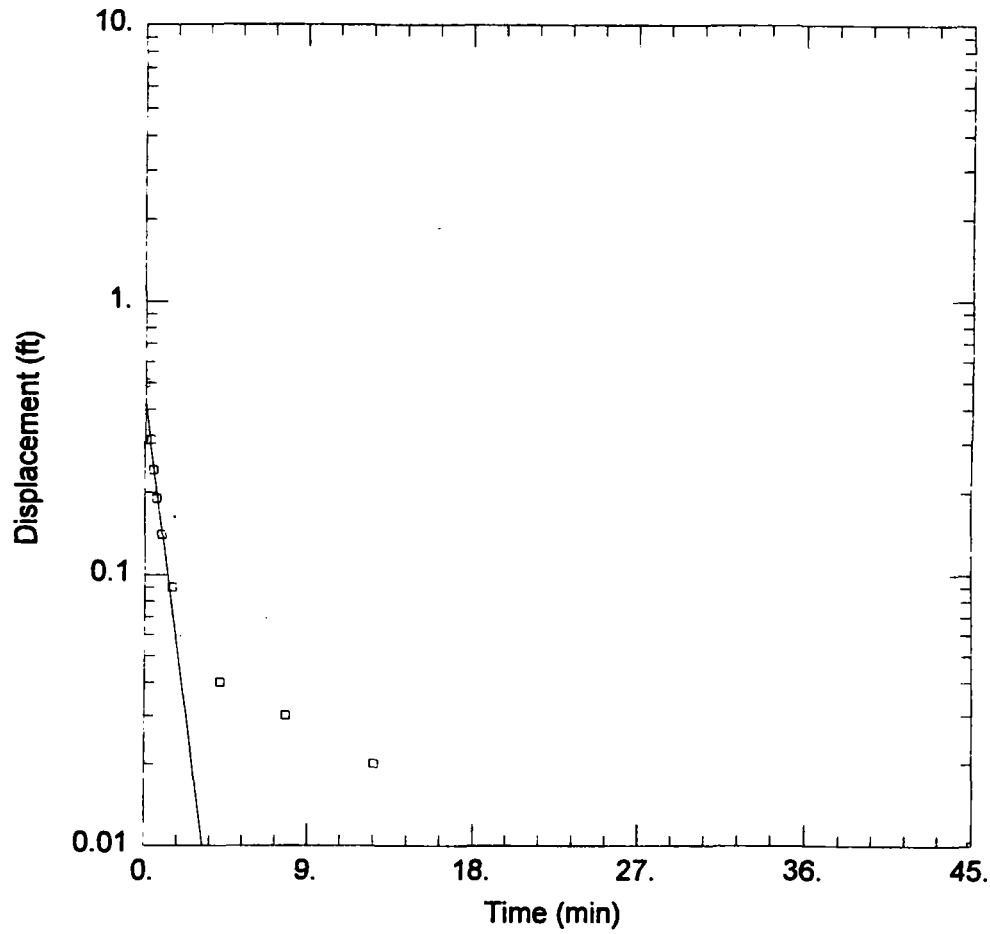
one well/borehole volume (gallons) - $\pi\ h_{water}\ [r_w^2 + n_{sp}\ (r_b^2 - r_w^2)] \times 7.48$ gal/ft^3

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

Signed: [signature] Date: 12/18/2000 QC'd By: [signature] Date: 1/15/01

71



33MWC-49

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC49.AQT
Date: 01/05/01 Time: 13:17:36

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Test Location: Marion, Illinois
Test Well: 33MWC-49
Test Date: 12/14/00

AQUIFER DATA

Saturated Thickness: 2.3 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (33MWC-49)

Initial Displacement: 0.5 ft ok
Casing Radius: 0.083 ft
Screen Length: 2.3 ft
Water Column Height: 2.3 ft
Wellbore Radius: 0.34 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.001205 cm/sec
y0 = 0.4306 ft

75

VTS 1/29/01

RMT INC.

SHEET ____ OF ____

744 Heartland Trail P.O. Box 8923 Madison, WI 53708-8923 (608) 831-4444 FAX: (608) 831-3334

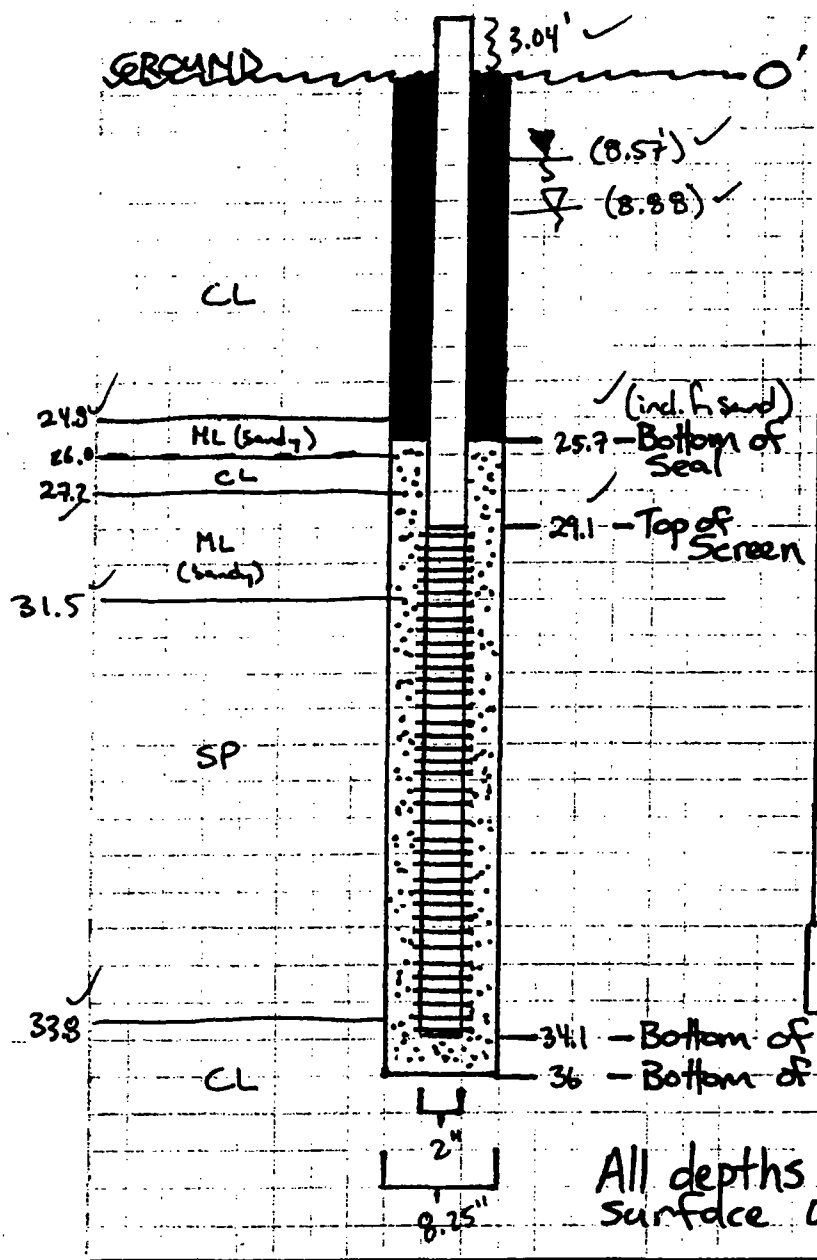
PROJECT / PROPOSAL NAME	PREPARED		CHECKED		PROJECT/PROPOSAL NO.
Crab Orchard NWR	By: HW	Date: 1/4/01	By: TRS	Date: 1/29/01	4781.07

BOUWER and RICE SINGLE-WELL RESPONSE TEST ANALYSIS

WELL NUMBER 33MWC-49

FIGURE IS NOT TO SCALE

DTW = 11.61' TOC
= 8.57' BGS



"SLUG TEST DATA" for Aqtesolv

Initial Drawdown = 0.31'

Radius of Well Casing = 0.083
(r_c or r_c')
0.083 0.186

Radius of Well (r_w) = 0.34

Saturated Aquifer Thickness (D) = 2.3

Effective Screen Length (L) = 2.3

Static Height of Water in Well (H) = 2.3

Default for Aquitards D=H=L

r_c' correction factor is NOT used to adjust for sand pack de-watering effects.

$$r_c' = \sqrt{r_c^2 + n_e(r_w^2 - r_c^2)}$$

Static Water Level

All depths are in feet below ground surface unless otherwise noted.

Assumptions:

Data Set: G:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\MWC49.AQT
Title: 33MWC-49
Date: 01/12/01
Time: 14:22:00

PROJECT INFORMATION

Company: RMT, Inc.
Client: Schlumberger
Project: 4781.07
Location: Marion, Illinois
Test Date: 12/14/00
Test Well: 33MWC-49

AQUIFER DATA

Saturated Thickness: 2.3 ft
Anisotropy Ratio (Kz/Kr): 1.

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: 33MWC-49

X Location: 0. ft
Y Location: 0. ft

No. of observations: 9

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.33	0.31	0.93	0.14	7.83	0.03
0.47	0.24	1.5	0.09	12.65	0.02
0.65	0.19	4.2	0.04	45.	0.01

1/29/01

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.001205	cm/sec
y0	0.4306	ft

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AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	0.001205	0.0002044	cm/sec
y0	0.4306	0.04858	ft

Parameter Correlations

	K	y0
K	1.00	0.90
y0	0.90	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 0.003512 ft^2
Variance ..... 0.0005017 ft^2
Std. Deviation..... 0.0224 ft
Mean ..... 0.0109 ft
No. of Residuals ... 9.
No. of Estimates ... 2

80

RMT INC.

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONWR

DATE: 12/14/2000

PROJECT NUMBER: 4781.07

SAMPLER(S): TJP

WELL NUMBER: MWC-49

WELL DIAMETER: 2" SS

DTW: 11.61 + 0.00 T/~~P~~/C

DTB: 38.30 + 0.00 T/~~P~~/C

Water Volume Removed: 1 gallon

Depth to Bottom: 38.30

Type of Test: baildown
(slug/baildown)

Initial Time: 102 End Time: _____

	Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
(min)	0/0/0	(Initial)	—			
0.33	0/0/20	11.92	0.31 ✓			
0.47	0/0/28	11.85	0.24 ✓			
0.65	0/0/39	11.80	0.19 ✓			
0.93	0/0/56	11.75	0.14 ✓			
1.5	0/1/30	11.70	0.09 ✓			
4.2	0/4/12	11.65	0.04 ✓			
7.83	0/7/50	11.64	0.03 ✓			
12.65	0/12/39	11.63	0.02 ✓			
45	147pm	11.62	0.01 ✓			
65	207pm	11.60	(+ 0.01) ✓			

* For water table wells, remove at least one well (borehole volume):

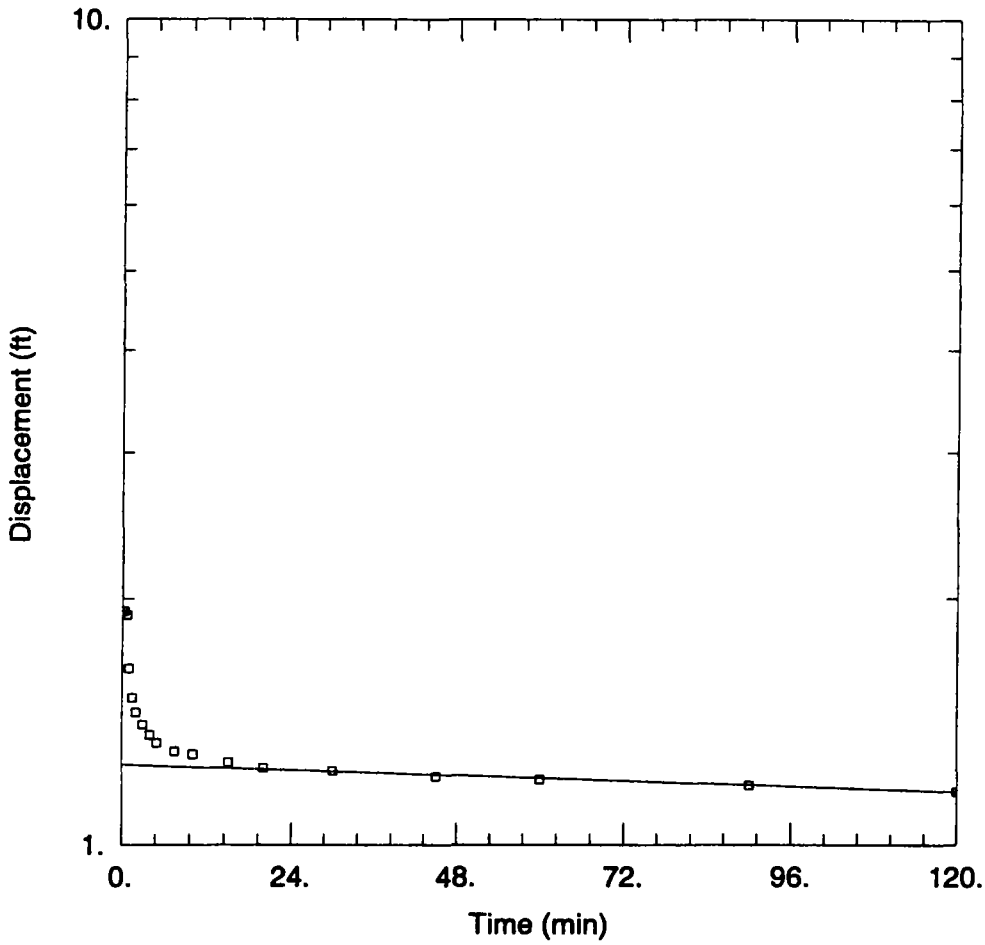
one well/borehole volume (gallons) - $\pi\ h_{water}\ [r_w^2 + n_{sp}\ (r_b^2 - r_w^2)] \times 7.48$ gal/ft^3

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

TJP — Signed; 12/18/2000 — Date; [signature] — QC'd By; 1/15/01 — Date

81



✓ RLW 2/7/01

SVE

Data Set: H:\DATA\PROJECTS\4781\02\sve.aqt
Date: 02/02/01 Time: 08:24:32

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.02
Test Location: Crab Orchard NWR
Test Well: MPE-UC
Test Date: 1/24/01

AQUIFER DATA

Saturated Thickness: 5.57 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (SVE)

Initial Displacement: 1.93 ft
Casing Radius: 0.083 ft
Screen Length: 5.57 ft
Water Column Height: 5.57 ft
Wellbore Radius: 0.25 ft
Gravel Pack Porosity: 0.25

85

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.392E-06 cm/sec
y0 = 1.252 ft

ANALYSIS - BOUWER AND RICE SINGLE-WELL RESPONSE TEST

PROJECT: Crab Orchard Nat. Wildlife Refuge PROJECT #: 4781.02
PREP'D BY: Tom Silverman CHECKED BY: MLW 2/7/01
FIELD TEST PERFORMED BY: R. Hoffmeister FIELD TEST DATE: 1/25/01

Data From: ☐ Data Logger/Transd. ■ Water level indicator/Stopwatch
☐ Slug Test ■ Baildown

Top of Casing = 429.47
Ground = 426.81

WELL NUMBER: SVE

Top of PVC 2.66 feet above gs

INITIAL DRAWDOWN (S)= 1.93 feet

SATURATED AQUIFER THICKNESS (D)*= 5.57 feet 10.5 - 4.93

EFFECTIVE SCREEN LENGTH (L)= 5.57 feet

STATIC HEIGHT OF WATER (H)= 5.57 feet

RADIUS OF WELL CASING
r_c= ~~0.167~~ 0.083 feet or ~~2~~ 1 inches

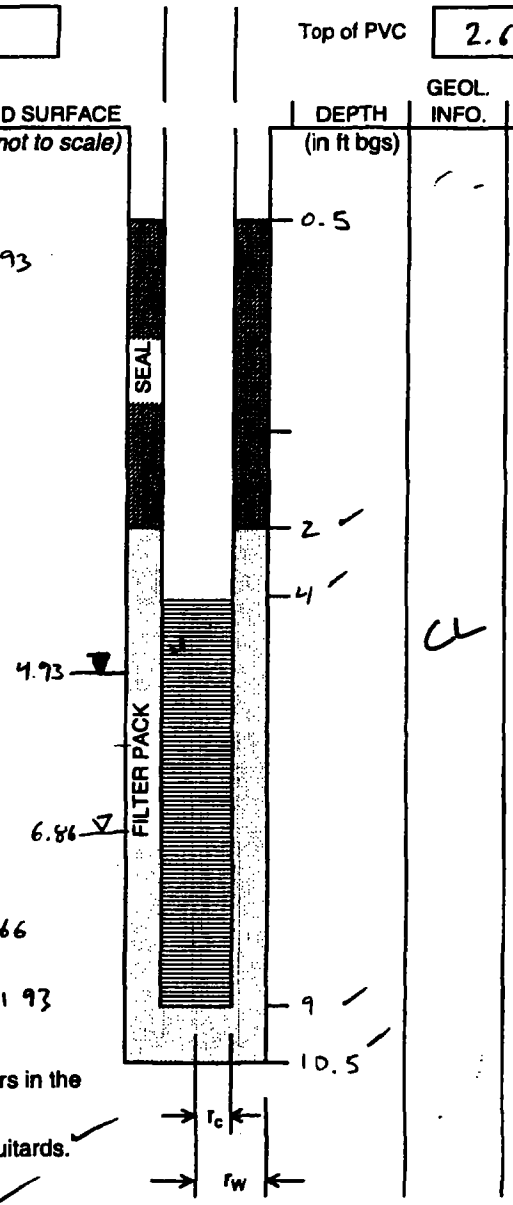
RADIUS OF BOREHOLE (WELL)
r_w= ~~0.330~~ 0.250 feet or ~~4~~ 3 inches

EFFECTIVE POROSITY
n= 0.25

CORRECTED RADIUS
$r'_c = [r_c^2 + n(r_w^2 - r_c^2)]^{1/2}$
r'_c= [illegible] feet 0.14

▼ STATIC WATER LEVEL= 7.59 - 2.66
4.93 (ft bgs)

▽ INITIAL DRAWDOWN LEVEL= 4.93 + 1.93
6.86 (ft bgs)



DEPTH (in ft bgs)	GEOL. INFO.	COMMENTS
0.5		SVE well blind drilled. Geologic info from SB-102.
2		
4	CL	
9		
10.5		

- if $K_f < 1 \times 10^{-2}$ cm/s and recovery occurs in the sand pack, use r'_c correction.
- D = H = L is default for analysis of aquitards.
- Other comments and/or assumptions: Use r_c correction.

- Assumes that the aquifer extends at least 2 feet below the end of boring:
☐ YES ☒ Other depth based on additional data

Data Set: H:\DATA\PROJECTS\4781\02\sve.aqt
Title: SVE
Date: 02/02/01
Time: 08:24:38

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.02
Location: Crab Orchard NWR
Test Date: 1/24/01
Test Well: MPE-UC

AQUIFER DATA

Saturated Thickness: 5.57 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Initial Displacement: 1.93 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.25 ft
Screen Length: 5.57 ft
Gravel Pack Porosity: 0.25
Static Water Column Height: 5.57 ft

No. of observations: 17

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.33	1.93	4.	1.36	30.	1.23
0.75	1.91	5.	1.33	45.	1.21
1.	1.64	7.5	1.3	60.	1.2
1.5	1.51	10.	1.29	90.	1.18
2.	1.45	15.	1.26	120.	1.16
3.	1.4	20.	1.24		

MCW 2/9/01

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

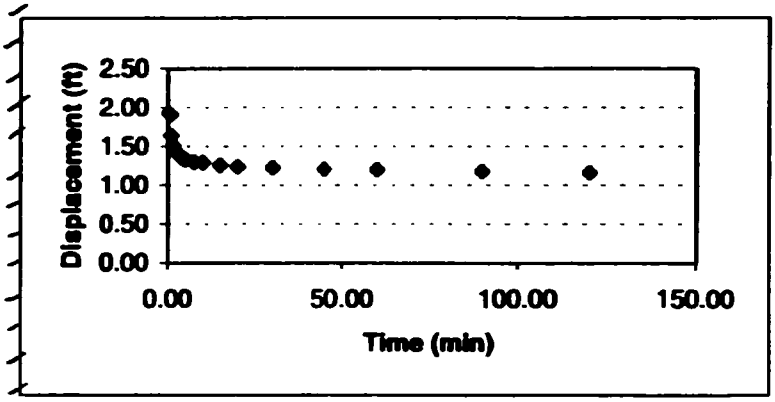
Parameter	Estimate	
K	1.392E-06	cm/sec
y0	1.252	ft

89

at I-1-2 area TSB

Time (min)	Water Level (ft btoc)	Displacement (ft)
0.33	9.52	1.93
0.75	9.50	1.91
1	9.23	1.64
1.5	9.10	1.51
2	9.04	1.45
3	8.99	1.40
4	8.95	1.36
5	8.92	1.33
7.5	8.89	1.30
10	8.88	1.29
15	8.85	1.26
20	8.83	1.24
30	8.82	1.23
45	8.80	1.21
60	8.79	1.20
90	8.77	1.18
120	8.75	1.16

Well name	SVE 1
Static water level =	7.59 ft btoc
Date	1/25/2001



RW 2/7/01

RMT INC.

Page ___ of ___

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONWR

DATE: 1/25/~~00~~ 01

PROJECT NUMBER: 4781.02

SAMPLER(S): REH

WELL NUMBER: SVE-1 (I-1-2) SVE well installed by RMT

WELL DIAMETER: 2"

DTW: 7.54 (+0.35) + 0.00 T/PVC

DTB: 11.91 + 0.10 T/PVC

Water Volume Removed: 2L

Depth to Bottom: 12.01

Type of Test: (slug/baildown)

Initial Time: 10:46:00 End Time: ____

Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
0/0/0	(Initial)	——	90 min.	8.77	1.18
20 s	9.52	1.93	120 min.	8.75	1.16
45 s	9.50	1.91			
60 s	9.23	1.64			
1.5 min.	9.10	1.51			
2 min.	9.04	1.45			
3 min.	8.99	1.40			
4 min.	8.95	1.36			
5 min.	8.92	1.33			
7½ min.	8.89	1.30			
10 min.	8.88	1.29			
15 min.	8.85	1.26			
20 min.	8.83	1.24			
30 min.	8.82	1.23			
45 min.	8.80	1.21			
60 min.	8.79	1.20			

* For water table wells, remove at least one well (borehole volume): 90% = 7.79

one well/borehole volume (gallons) - $\pi\ h_{water}\ [r_w^2 + n_{sp}\ (r_b^2 - r_w^2)] \times 7.48$ gal/ft^3

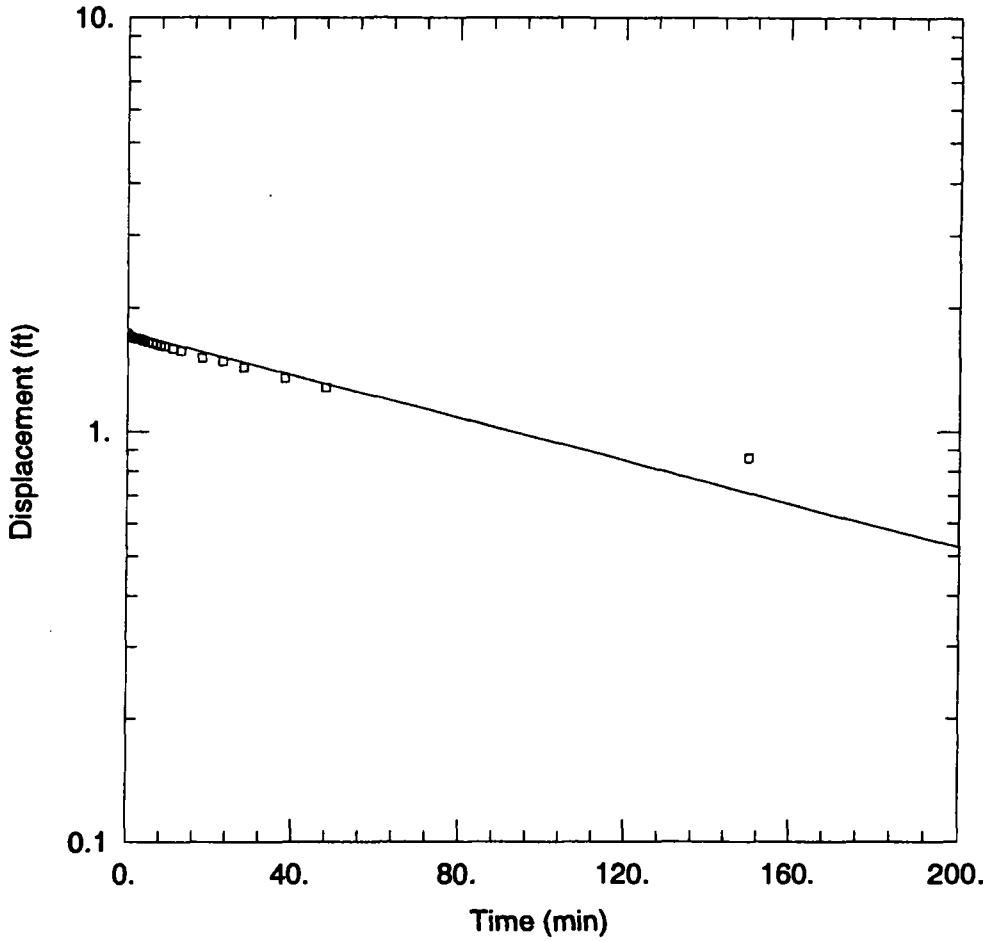
n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

Signed ____ Date ____ QC'd By [signature] Date 2/7/01 91

REV 01/05/94

F-189



✓ μcw 2/7/01

MPE-UC2

Data Set: H:\DATA\PROJECTS\4781\02\mpe-uc2.aqt
Date: 01/31/01 Time: 16:15:48

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.02
Test Location: Crab Orchard NWR
Test Well: MPE-UC
Test Date: 1/24/01

AQUIFER DATA

Saturated Thickness: 7.1 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MPE-UC2)

Initial Displacement: 1.73 ft
Water Column Height: 7.1 ft
Casing Radius: 0.167 ft
Wellbore Radius: 0.333 ft
Screen Length: 7.1 ft

SOLUTION

95

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.36E-05 cm/sec
y0 = 1.74 ft

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\mpe-uc2.aqt
Title: MPE-UC2
Date: 02/07/01
Time: 10:08:14

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.02
Location: Crab Orchard NWR
Test Date: 1/24/01
Test Well: MPE-UC

AQUIFER DATA

Saturated Thickness: 7.1 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Initial Displacement: 1.73 ft
Casing Radius: 0.167 ft
Wellbore Radius: 0.333 ft
Screen Length: 7.1 ft
Gravel Pack Porosity: 0.
Static Water Column Height: 7.1 ft

No. of observations: 23

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.	1.73	3.5	1.67	13.	1.57
0.33	1.71	4.	1.66	18.	1.51
0.67	1.7	5.	1.65	23.	1.48
1.	1.7	6.	1.64	28.	1.43
1.5	1.69	7.	1.63	38.	1.35
2.	1.69	8.	1.62	48.	1.28
2.5	1.68	9.	1.61	150.	0.86
3.	1.68	11.	1.59		

PLW 2/7/01

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	1.36E-05	cm/sec

97

y0	1.74	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	1.36E-05	4.456E-07	cm/sec
y0	1.74	0.007032	ft

Parameter Correlations

	K	y0
K	1.00	0.50
y0	0.50	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 0.01567 ft^2
Variance..... 0.000746 ft^2
Std. Deviation..... 0.02731 ft
Mean ..... 0.0004665 ft
No. of Residuals ... 23.
No. of Estimates ... 2

ANALYSIS - BOUWER AND RICE SINGLE-WELL RESPONSE TEST

PROJECT: Crab Orchard Nat. Wildlife Refuge PROJECT #: 4781.02
PREP'D BY: Tom Silverman CHECKED BY: MLW 2/7/01
FIELD TEST PERFORMED BY: L. Bakkren FIELD TEST DATE: 1/24/01

Data From: ☐ Data Logger/Transd. ■ Water level indicator/Stopwatch
☐ Slug Test ■ Baildown

Top of casing = 434.60
Ground = 431.65

WELL NUMBER: MPE-UC2

Top of PVC 2.95 feet above gs

INITIAL DRAWDOWN
(S)= 1.73 feet

SATURATED AQUIFER THICKNESS
(D)*= 7.1 feet 49 - 41.9

EFFECTIVE SCREEN LENGTH
(L)= 7.1 feet

STATIC HEIGHT OF WATER
(H)= 7.1 feet

RADIUS OF WELL CASING
r_c= 0.167 feet or 2 inches

RADIUS OF BOREHOLE (WELL)
r_w= 0.333 feet or 4 inches

EFFECTIVE POROSITY
n= 0.25

CORRECTED RADIUS
$r'_c = [r_c^2 + n(r_w^2 - r_c^2)]^{1/2}$
NA ~~r'_c= 0.22 feet~~ NA

▼ STATIC WATER LEVEL= 22.61 - 2.95
19.66 (ft bgs)

▽ INITIAL DRAWDOWN LEVEL= 19.66 + 1.73
21.39 (ft bgs)

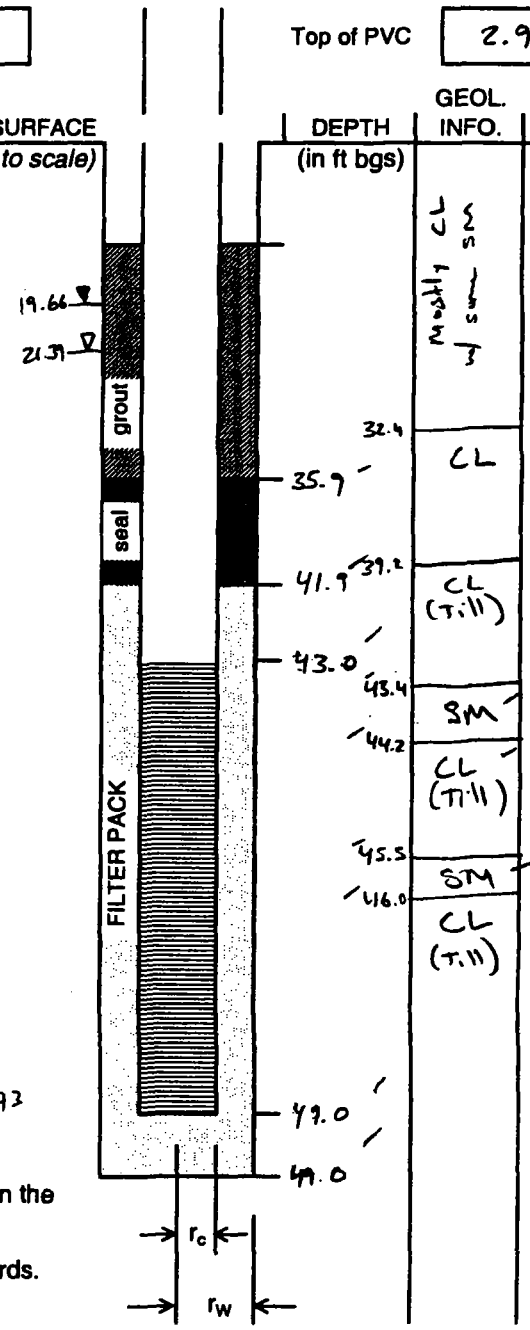
NA → if $K_f < 1 \times 10^{-2}$ cm/s and recovery occurs in the sand pack, use r'_c correction.

- D = H = L is default for analysis of aquitards.
- Other comments and/or assumptions:

- Assumes that the aquifer extends at least 2 feet below the end of boring:
☐ YES ☒ Other depth based on additional data

Aquitard

GROUND SURFACE
(figure is not to scale)



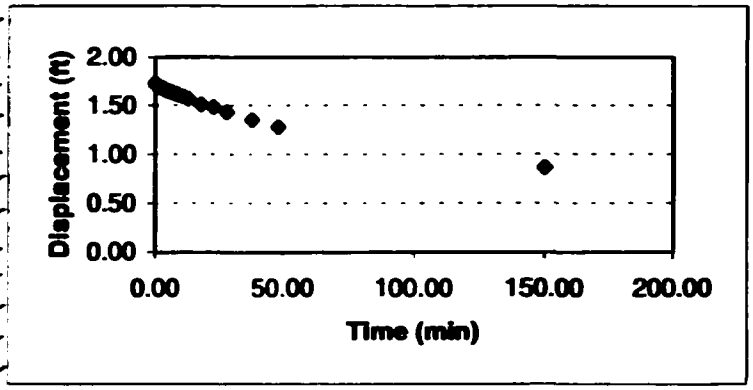
DEPTH (in ft bgs)	GEOL. INFO.	COMMENTS
	Mostly sand	MPE-UC2 blind drilled. Geologic info taken from SB-411
32.4		
35.9	CL	
39.2		
41.9	CL (Till)	T. pebbles, l-c sand
43.0		
43.4	SM	
44.2	CL (Till)	
45.5	SM	
46.0	CL (Till)	
49.0		
49.0		

99

G:\DATA\SILVERMT\genericslug.XLS

Time (min)	Water Level (ft btoc)	Displacement (ft)
0.00	24.34	1.73
0.33	24.32	1.71
0.67	24.31	1.70
1	24.31	1.70
1.5	24.30	1.69
2	24.30	1.69
2.5	24.29	1.68
3	24.29	1.68
3.5	24.28	1.67
4	24.27	1.66
5	24.26	1.65
6	24.25	1.64
7	24.24	1.63
8	24.23	1.62
9	24.22	1.61
11	24.20	1.59
13	24.18	1.57
18	24.12	1.51
23	24.09	1.48
28	24.04	1.43
38	23.96	1.35
48	23.89	1.28
150	23.47	0.86

Well name	MPE-UC2
Static water level =	22.61 ft btoc
Date	1/24/2001



✓ μw
2/7/01

100

RMT INC.

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONWR

DATE: 1/24/01

PROJECT NUMBER: 478102

SAMPLER(S): L. Bakken

WELL NUMBER: MPE-UC2

WELL DIAMETER: 4"

DTW: 22.61 + 0.00 T/PVC

DTB: 51.55 + 0.18 T/PVC

Water Volume Removed: 4 bailers

Depth to Bottom: 51.73

Type of Test: baildown
(slug/baildown)

Initial Time: 14:07:00 End Time: 16:37:00

Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
0/0/0	(Initial)	———	14:18:00	24.20	1.59
14:07:00	24.34	1.73	14:20:00	24.18	1.57
14:07:20	24.32	1.71	14:25:00	24.12	1.51
14:07:40	24.31	1.70	14:30:00	24.09	1.48
14:08:00	24.31	1.70	14:35:00	24.04	1.43
14:08:30	24.30	1.69	14:45:00	23.96	1.35
14:09:00	24.30	1.69	14:55:00	23.89	1.28
14:09:30	24.29	1.68	16:37:00	23.47	0.86
14:10:00	24.29	1.68			
14:10:30	24.28	1.67			
14:11:00	24.27	1.66			
14:12:00	24.26	1.65			
14:13:00	24.25	1.64			
14:14:00	24.24	1.63			
14:15:00	24.23	1.62			
14:16:00	24.22	1.61			

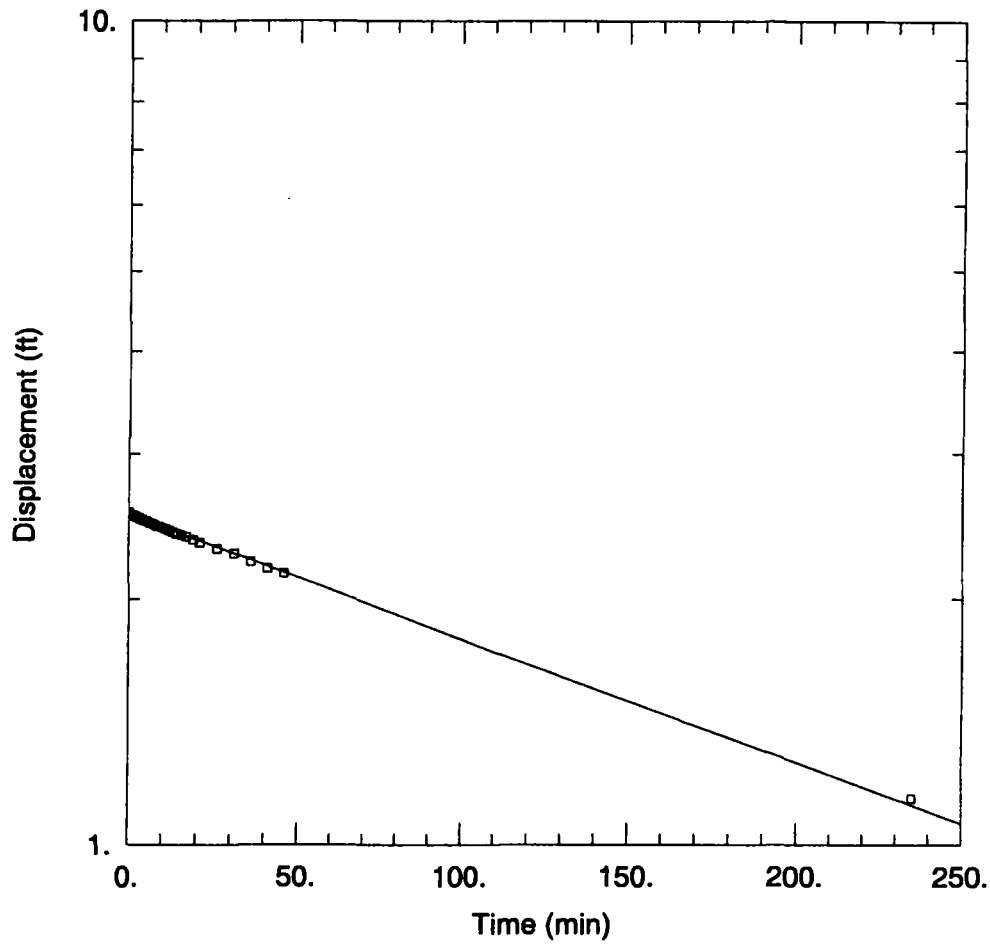
* For water table wells, remove at least one well (borehole volume):

one well/borehole volume (gallons) - $\pi\ h_{water}\ [r_w^2 + n_{sp}\ (r_b^2 - r_w^2)] \times 7.48\ gal/ft^3$

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

Signed: [signature] Date: 1/26/01 QC'd By: MLW 2/7/01 Date: 101



✓ pi.cw 2/7/01

MPE-UC1

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\mpe-uc1.aqt
Date: 02/07/01 Time: 10:07:45

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.02
Test Location: Crab Orchard NWR
Test Well: MPE-UC
Test Date: 1/24/01

AQUIFER DATA

Saturated Thickness: 6.3 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MPE-UC1)

Initial Displacement: 2.55 ft Water Column Height: 6.3 ft
Casing Radius: 0.167 ft Wellbore Radius: 0.333 ft
Screen Length: 6.3 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 8.486E-06 cm/sec y0 = 2.529 ft

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Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\mpe-uc1.aqt
Title: MPE-UC1
Date: 02/07/01
Time: 10:07:49

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.02
Location: Crab Orchard NWR
Test Date: 1/24/01
Test Well: MPE-UC

AQUIFER DATA

Saturated Thickness: 6.3 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Initial Displacement: 2.55 ft
Casing Radius: 0.167 ft
Wellbore Radius: 0.333 ft
Screen Length: 6.3 ft
Gravel Pack Porosity: 0.
Static Water Column Height: 6.3 ft

No. of observations: 35

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.	2.55	4.5	2.49	14.	2.4
0.33	2.54	5.	2.49	15.5	2.39
0.67	2.53	5.67	2.48	17.	2.38
1.	2.53	6.33	2.47	19.	2.36
1.33	2.53	7.	2.47	21.	2.34
1.67	2.52	7.67	2.46	26.	2.3
2.	2.52	8.33	2.45	31.	2.27
2.33	2.51	9.	2.45	36.	2.22
2.67	2.51	10.	2.44	41.	2.18
3.	2.51	11.	2.43	46.	2.15
3.5	2.5	12.	2.42	235.	1.14
4.	2.5	13.	2.41		

prw 2/7/01

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

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Estimated Parameters

Parameter	Estimate	
K	8.486E-06	cm/sec
y0	2.529	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	8.486E-06	7.365E-08	cm/sec
y0	2.529	0.001822	ft

Parameter Correlations

	K	y0
K	1.00	0.50
y0	0.50	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 0.002614 ft^2
Variance..... 7.922E-05 ft^2
Std. Deviation..... 0.0089 ft
Mean ..... 0.0001105 ft
No. of Residuals ... 35.
No. of Estimates ... 2

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ANALYSIS - BOUWER AND RICE SINGLE-WELL RESPONSE TEST

PROJECT: Crab Orchard Nat. Wildlife Refuge PROJECT #: 4781.02
PREP'D BY: Tom Silverman CHECKED BY: MW 2/7/01
FIELD TEST PERFORMED BY: L. Bakken FIELD TEST DATE: 1/24/01

Data From: ☐ Data Logger/Transd. ■ Water level indicator/Stopwatch
☐ Slug Test ■ Baildown

Top of casing = 434.58
grout = 431.86

WELL NUMBER: MPE - UC1

Top of PVC 2.72 feet above gs

INITIAL DRAWDOWN
(S)= 2.55 feet

SATURATED AQUIFER THICKNESS
(D)*= 6.3 feet 40.3 − 34

EFFECTIVE SCREEN LENGTH
(L)= 6.3 feet

STATIC HEIGHT OF WATER
(H)= 6.3 feet

RADIUS OF WELL CASING
r_c= 0.167 feet or 2 inches

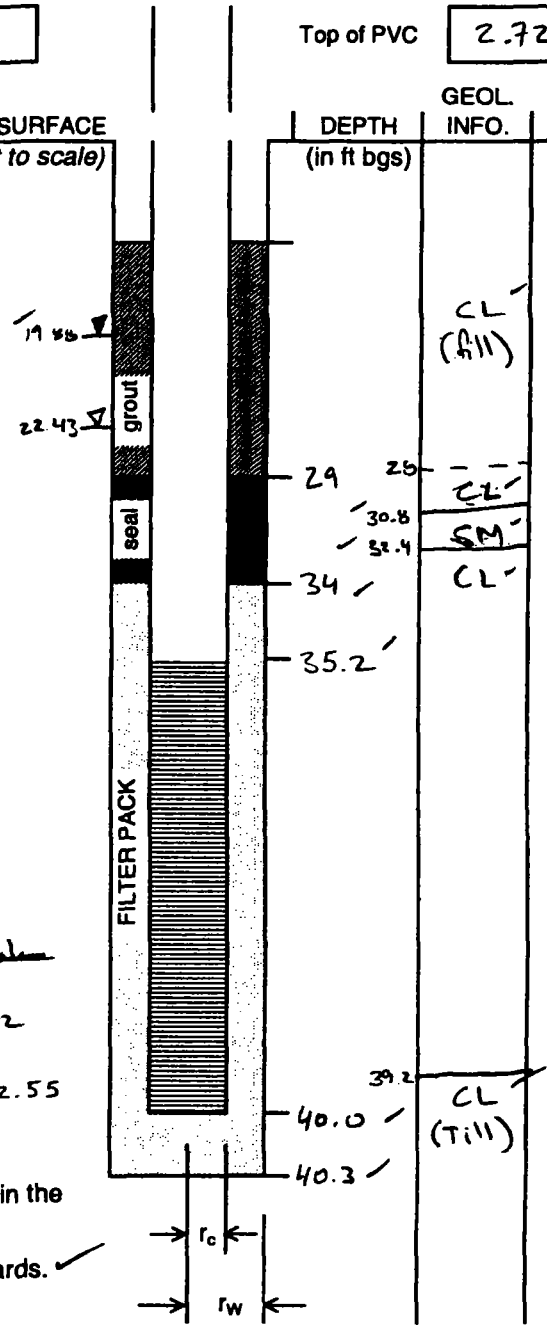
RADIUS OF BOREHOLE (WELL)
r_w= 0.333 feet or 4 inches

EFFECTIVE POROSITY
n= 0.25

CORRECTED RADIUS
$r'_c = [r_c^2 + n(r_w^2 - r_c^2)]^{1/2}$
NA r'_c= ~~0.22~~ feet ~~Not applicable~~

▼ STATIC WATER LEVEL= 22.60 − 2.72
19.88 (ft bgs)

▽ INITIAL DRAWDOWN LEVEL= 19.88 + 2.55
22.43 (ft bgs)



MPE-UC1 Blind drilled
Geologic info taken from SB-411

recovery → sandpack

- if $K_f < 1 \times 10^{-2}$ cm/s and recovery occurs in the sand pack, use r'_c correction.
- → D = H = L is default for analysis of aquitards.
- Other comments and/or assumptions:

* Assumes that the aquifer extends at least 2 feet below the end of boring:
☐ YES ☒ Other depth based on additional data
→ Aquitard

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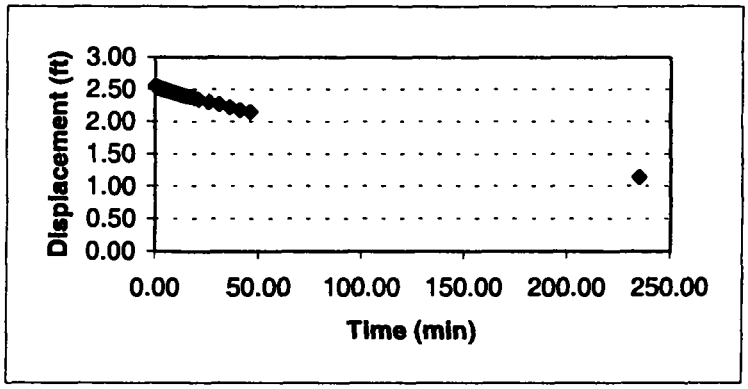
Time (min)	Water Level (ft btoc)	Displacement (ft)
0.00	25.15	2.55
0.33	25.14	2.54
0.67	25.13	2.53
1	25.13	2.53
1.33	25.13	2.53
1.67	25.12	2.52
2	25.12	2.52
2.33	25.11	2.51
2.67	25.11	2.51
3	25.11	2.51
3.5	25.10	2.50
4	25.10	2.50
4.5	25.09	2.49
5	25.09	2.49
5.67	25.08	2.48
6.33	25.07	2.47
7	25.07	2.47
7.67	25.06	2.46
8.33	25.05	2.45
9	25.05	2.45
10	25.04	2.44
11	25.03	2.43
12	25.02	2.42
13	25.01	2.41
14	25.00	2.40
15.5	24.99	2.39
17	24.98	2.38
19	24.96	2.36
21	24.94	2.34
26	24.90	2.30
31	24.87	2.27
36	24.82	2.22
41	24.78	2.18
46	24.75	2.15
235	23.74	1.14

Well name MPE-UC1

Static water level = 22.60 ft btoc

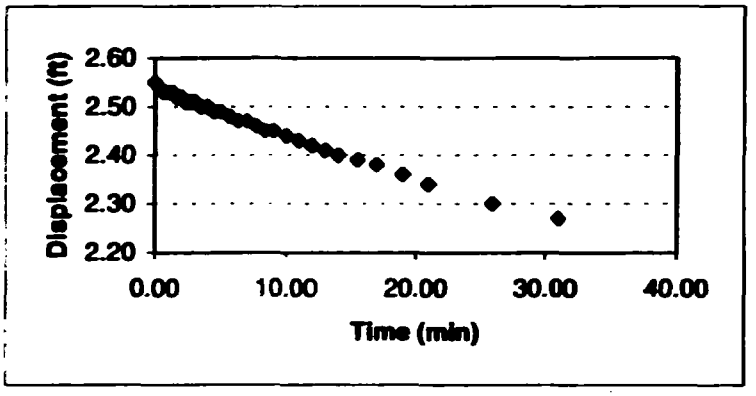
Date 1/24/2001



pcw 2/7/01

Time (min)	Water Level (ft btoc)	Displacement (ft)
0.00	25.15	2.55
0.33	25.14	2.54
0.67	25.13	2.53
1	25.13	2.53
1.33	25.13	2.53
1.67	25.12	2.52
2	25.12	2.52
2.33	25.11	2.51
2.67	25.11	2.51
3	25.11	2.51
3.5	25.10	2.50
4	25.10	2.50
4.5	25.09	2.49
5	25.09	2.49
5.67	25.08	2.48
6.33	25.07	2.47
7	25.07	2.47
7.67	25.06	2.46
8.33	25.05	2.45
9	25.05	2.45
10	25.04	2.44
11	25.03	2.43
12	25.02	2.42
13	25.01	2.41
14	25.00	2.40
15.5	24.99	2.39
17	24.98	2.38
19	24.96	2.36
21	24.94	2.34
26	24.90	2.30
31	24.87	2.27

Well name MPE-UC1
Static water level = 22.60 ft btoc
Date 1/24/2001



RMT INC.

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FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONWR

DATE: 1/24/01

PROJECT NUMBER: 4781.02

SAMPLER(S): Lance Bakken

WELL NUMBER: MPE-UC1 Repos.

WELL DIAMETER: 4"

DTW: 22.60 + 0.00 T/PVC

DTB: 42.99 + 0.17 T/PVC

Water Volume Removed: 5 bailers

Depth to Bottom: 43.16

Type of Test: baildown
(slug/baildown)

Initial Time: 9:50:00 End Time: 13:45:00

Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
0/0/0	(Initial)	——	9:56:20	25.07	2.47
9:50:00	25.15	2.55	9:57:00	25.07	2.47
9:50:20	25.14	2.54	9:57:40	25.06	2.46
9:50:40	25.13	2.53	9:58:20	25.05	2.45
9:51:00	25.13	2.53	9:59:00	25.05	2.45
9:51:20	25.13	2.53	10:00:00	25.04	2.44
9:51:40	25.12	2.52	10:01:00	25.03	2.43
9:52:00	25.12	2.52	10:02:00	25.02	2.42
9:52:20	25.11	2.51	10:03:00	25.01	2.41
9:52:40	25.11	2.51	10:04:00	25.00	2.40
9:53:00	25.11	2.51	10:05:30	24.99	2.39
9:53:30	25.10	2.50	10:07:00	24.98	2.38
9:54:00	25.10	2.50	10:09:00	24.96	2.36
9:54:30	25.09	2.49	10:11:00	24.94	2.34
9:55:00	25.09	2.49	10:16:00	24.90	2.30
9:55:40	25.08	2.48	10:21:00	24.87	2.2

:40

1:00

1:30

2:00

5:00

:20

:30

:40

* For water table wells, remove at least one well (borehole volume):

one well/borehole volume (gallons) - $\pi\ h_{water}\ [r_w^2 + n_{sp}\ (r_b^2 - r_w^2)] \times 7.48$ gal/ft^3

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

Signed: [signature] Date: 1/26/01 QC'd By: MCW 2/7/01 Date: 113

REV 01/05/94

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RMT

continued

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: _____ DATE: _____

PROJECT NUMBER: _____ SAMPLER(S): _____

WELL NUMBER: MPE-UC1 WELL DIAMETER: _____

DTW: _____ + _____ T/PVC DTB: _____ + _____ T/PVC

Water Volume Removed: _____ Depth to Bottom: _____

Type of Test: _____ Initial Time: _____ End Time: _____
(slug/baildown)

Time	Water Level	Drawdown	Time (HH:MS)	Water Level	Drawdown
~~0/0/0~~	~~(Initial)~~	~~—~~			
10:26:00	24.82	2.27			
10:31:00	24.78	2.18			
10:36:00	24.75	2.15			
13:45:00	23.74	1.14			

* For water table wells, remove at least one well (borehole volume):

one well/borehole volume (gallons) - $\pi\ h_{water}\ [r_w^2 + n_{sp}\ (r_b^2 - r_w^2)] \times 7.48$ gal/ft^3

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

Signed _____ Date 1/26/01 QC'd By MW 2/7/01 Date _____

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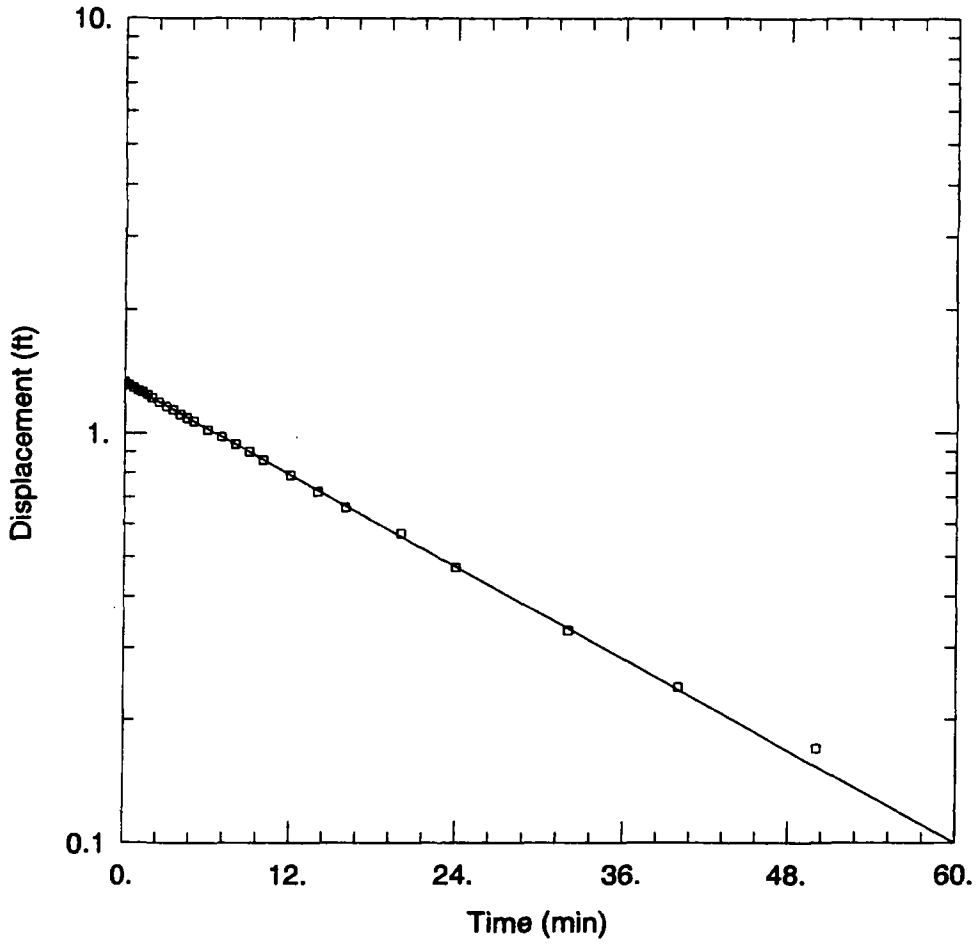

✓ μlw 2/7/01

MPE-UC

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\mpe-uc.aqt
Date: 02/07/01 Time: 10:07:17

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.02
Test Location: Crab Orchard NWR
Test Well: MPE-UC
Test Date: 1/24/01

AQUIFER DATA

Saturated Thickness: 7.2 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MPE-UC)

Initial Displacement: 1.33 ft
Water Column Height: 7.2 ft
Casing Radius: 0.167 ft
Wellbore Radius: 0.333 ft
Screen Length: 7.2 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 9.706E-05 cm/sec
y0 = 1.327 ft

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Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\mpe-uc.aqt
Title: MPE-UC
Date: 02/07/01
Time: 10:07:22

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.02
Location: Crab Orchard NWR
Test Date: 1/24/01
Test Well: MPE-UC

AQUIFER DATA

Saturated Thickness: 7.2 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Initial Displacement: 1.33 ft
Casing Radius: 0.167 ft
Wellbore Radius: 0.333 ft
Screen Length: 7.2 ft
Gravel Pack Porosity: 0.
Static Water Column Height: 7.2 ft

No. of observations: 26

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.	1.33	3.5	1.14	12.	0.79
0.33	1.31	4.	1.11	14.	0.72
0.67	1.29	4.5	1.09	16.	0.66
1.	1.27	5.	1.07	20.	0.57
1.33	1.26	6.	1.02	24.	0.47
1.67	1.24	7.	0.98	32.	0.33
2.	1.22	8.	0.94	40.	0.24
2.5	1.19	9.	0.9	50.	0.17
3.	1.16	10.	0.86		

MLW 2/7/01

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate

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K	9.706E-05	cm/sec
y0	1.327	ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	
K	9.706E-05	4.464E-07	cm/sec
y0	1.327	0.00181	ft

Parameter Correlations

	K	y0
K	1.00	0.64
y0	0.64	1.00

Residual Statistics

for weighted residuals

Sum of Squares ... 0.0006724 ft^2
Variance..... 2.802E-05 ft^2
Std. Deviation..... 0.005293 ft
Mean ..... 0.0003933 ft
No. of Residuals ... 26.
No. of Estimates ... 2

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ANALYSIS - BOUWER AND RICE SINGLE-WELL RESPONSE TEST

PROJECT: Crab Orchard Nat. Wildlife Refuge PROJECT #: 4781.02
PREP'D BY: Tom Silverman CHECKED BY: MLW 2/7/01
FIELD TEST PERFORMED BY: L. Bakker FIELD TEST DATE: 1/24/01

Data From: ☐ Data Logger/Transd. ■ Water level indicator/Stopwatch
☐ Slug Test ■ Baildown

Top of Casing = 423.35
Ground = 420.69

WELL NUMBER: MPE-11C

Top of PVC 2.66 feet above gs

INITIAL DRAWDOWN
(S)= 1.33 feet

SATURATED AQUIFER THICKNESS
(D)*= 7.2 feet 18.2-11

EFFECTIVE SCREEN LENGTH
(L)= 7.2 feet

STATIC HEIGHT OF WATER
(H)= 7.2 feet

RADIUS OF WELL CASING
r_c= 0.167 feet or 2 inches

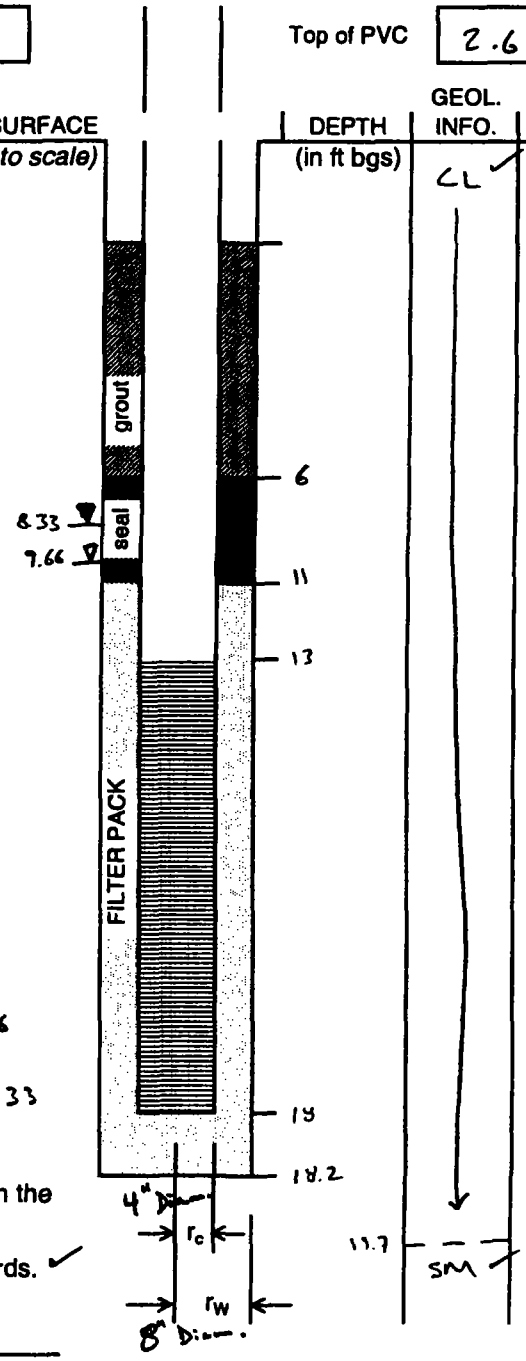
RADIUS OF BOREHOLE (WELL)
r_w= 0.333 feet or 4 inches

EFFECTIVE POROSITY
n= 0.25

CORRECTED RADIUS
$r'_c = [r_c^2 + n(r_w^2 - r_c^2)]^{1/2}$
r'_c= 0.22 feet NA

▼ STATIC WATER LEVEL= 10.99 - 2.66
8.33 (ft bgs)

▽ INITIAL DRAWDOWN LEVEL= 8.33+1.33
9.66 (ft bgs)



NA → • if $K_f < 1 \times 10^{-2}$ cm/s and recovery occurs in the sand pack, use r'_c correction.

→ • D = H = L is default for analysis of aquitards.

• Other comments and/or assumptions:

* Assumes that the aquifer extends at least 2 feet below the end of boring:
☐ YES ☒ Other depth based on additional data

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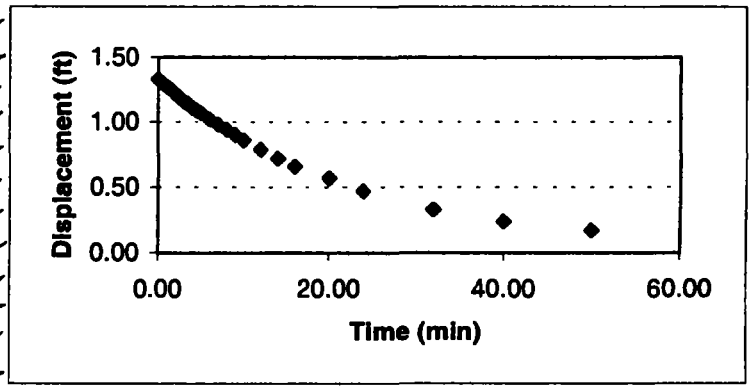
Time (min)	Water Level (ft btoc)	Displacement (ft)
0.00	12.32	1.33
0.33	12.30	1.31
0.67	12.28	1.29
1	12.26	1.27
1.33	12.25	1.26
1.67	12.23	1.24
2	12.21	1.22
2.5	12.18	1.19
3	12.15	1.16
3.5	12.13	1.14
4	12.10	1.11
4.5	12.08	1.09
5	12.06	1.07
6	12.01	1.02
7	11.97	0.98
8	11.93	0.94
9	11.89	0.90
10	11.85	0.86
12	11.78	0.79
14	11.71	0.72
16	11.65	0.66
20	11.56	0.57
24	11.46	0.47
32	11.32	0.33
40	11.23	0.24
50	11.16	0.17

Well name MPE-UC

Static water level = 10.99 ft btoc

Date 1/24/2001



MW
2/7/01

RMT INC.

Page ___ of ___

FIELD HYDRAULIC CONDUCTIVITY TEST

PROJECT NAME: CONWR

DATE: 1/24/01

PROJECT NUMBER: 4781.02

SAMPLER(S): LJB

WELL NUMBER: MPE-UC I-1-23 AREA

WELL DIAMETER: 4"

DTW: 10.99 + 0.00 T/PVC

DTB: 20.52 + 0.18 T/PVC

Water Volume Removed: 4 bailers

Depth to Bottom: 20.70

Type ~~of Test~~: Bail down
(slug/baildown)

Initial Time: 15:40:00 End Time: 16:30:00

Time (H/M/S)	Water Level	Drawdown	Time (H/M/S)	Water Level	Drawdown
0/0/0	(Initial)	—	15:43:30	12.13	
~~15~~	~~12.16~~		15:44:00	12.10	
~~15:34:30~~	~~12.16~~		15:44:30	12.08	
~~15:35:30~~	~~12.11~~		15:45:00	12.06	
~~15:35:30~~	~~12.08~~		15:46:00	12.01	
~~15:36:10~~	~~12.06~~		15:47:00	11.97	
~~15~~			15:48:00	11.93	
15:40:00	12.32		15:49:00	11.89	
15:40:20	12.30		15:50:00	11.85	
15:40:40	12.28		15:52:00	11.78	
15:41:00	12.26		15:54:00	11.71	
15:41:20	12.25		15:56:00	11.65	
15:41:40	12.23		16:00:00	11.56	
15:42:00	12.21		16:04:00	11.46	
15:42:30	12.18		16:12:00	11.32	
15:43:00	12.15		16:20:00	11.23	
			16:30:00	11.16	

* For water table wells, remove at least one well (borehole volume):

one well/borehole volume (gallons) - $\pi\ h_{water}\ [r_w^2 + n_{sp}\ (r_b^2 - r_w^2)] \times 7.48\ gal/ft^3$

n_{sp} = porosity of sand pack = 0.25, w = well, b = borehole

* For piezometers, remove sufficient water to produce at least 1 foot of drawdown, but no not lower water level into the sandpack.

Signed: [signature] Date: 1/26/01 QC'd By: ___ Date: ___

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Appendix E
Aquifer Test Data and Aquifer Characteristic Calculations

RMT
744 Heartland Trail
Madison, WI 53717-1934
Tel. (608) 831-4444 • Fax (608) 831-3334

PROJECT / PROPOSAL NAME / LOCATION: Crab Orchard - MPE Tests			PROJECT / PROPOSAL NO 4781.06
SUBJECT:			
PREPARED BY: G. Kroeger	DATE: 1/9/01		FINAL ☐
CHECKED BY: S. Martin	DATE: 5/7/01		REVISION ☐

I-1-23 MPE Test-

Hantush Leaky Aquifer Soln with Storage, Partial Penetration, $K_v/K_h = 0.1$

Upper Sand MPE-1C

β	T (ft²/min)	S	K (ft/min) (b=20')
0.01	0.15	0.16	7.5×10^{-3}
0.0001	0.155	0.19	7.8×10^{-3}
0.2	0.10	0.10	
0.001	0.16	0.14	8×10^{-3}

But $\beta = 0.2$ is not a reasonable value:

$$\beta = \frac{r}{4}\left[\frac{(K'S')^{1/2}}{(b'TS)^{1/2}} + \frac{(K''S'')^{1/2}}{(b''TS)^{1/2}}\right]$$

(K' - upper clay, K'' - lower clay)

assuming $K''S''$ is very low for the lower clay unit, $\frac{(K''S'')^{1/2}}{(b''TS)^{1/2}} \to 0$

$$\therefore \beta = \frac{r}{4}\left[\frac{(K'S')^{1/2}}{(b'TS)^{1/2}}\right] = \frac{3.5\text{ ft}}{4}\left[\frac{(K'S')^{1/2}}{((10\text{ ft})(0.1)(0.1))^{1/2}}\right] =$$

$$\beta = 0.875\left[\frac{(K'S')^{1/2}}{(0.1)^{1/2}}\right] = (0.875)(0.32)(K'S')^{1/2}$$

let $\beta = 0.01$

$$0.01 = (0.875)(0.32)(K'S')^{1/2}$$

$$0.036 = (K'S')^{1/2}$$

$$K'S' = 0.0013$$

let $S' = 0.0001$ then $K' = 12.8$ ft/min

let $S' = 10^{-3}$ then $K' = 1.3$

let $S' = 10^{-2}$ then $K' = 0.13$

let $S' = 10^{-1}$ then $K' = 0.013$

let $\beta = 0.001$

$K'S' = 0.00013$

let $S' = 10^{-2}$ then $K' = 0.013$

$S' = 10^{-3}$ $K' = \cancel{0.0013}$ 0.13

$S' = 10^{-1}$ $K' = 0.0013$

let $\beta = 0.0001$

$K'S' = 0.000013$

if $S' = 10^{-1}$ $K' = 0.00013$

$S' = 10^{-2}$ $K' = 0.0013$

$S' = 10^{-3}$ $K' = 0.013$

3

RMT
744 Heartland Trail
Madison, WI 53717-1934
Tel 608 831-4444 • Fax (608) 831-3334

PROJECT PROPOSAL NAME LOCATION: Cold Springs	MPE Tests	PROJECT PROPOSAL NO. 4781.06
SUBJECT		
PREPARED BY G. Kroeger	DATE 1/4/01	FINAL ☐
CHECKED BY S. Martin	DATE [illegible]	REVISION ☐

~~Try Neuman solution for unconfined aquifers,~~

Could not obtain a reasonable fit to data, using realistic values of Sy less than 1.0.

∴ Aquifer does not act as an unconfined aquifer during pumping test.

Try Theis Solution - Confined Aq.

Similar to, but higher values for T, than Cooper-Jacob straight line method.

Limitations: Doesn't consider leakage from aquitards, partial penetration effect.

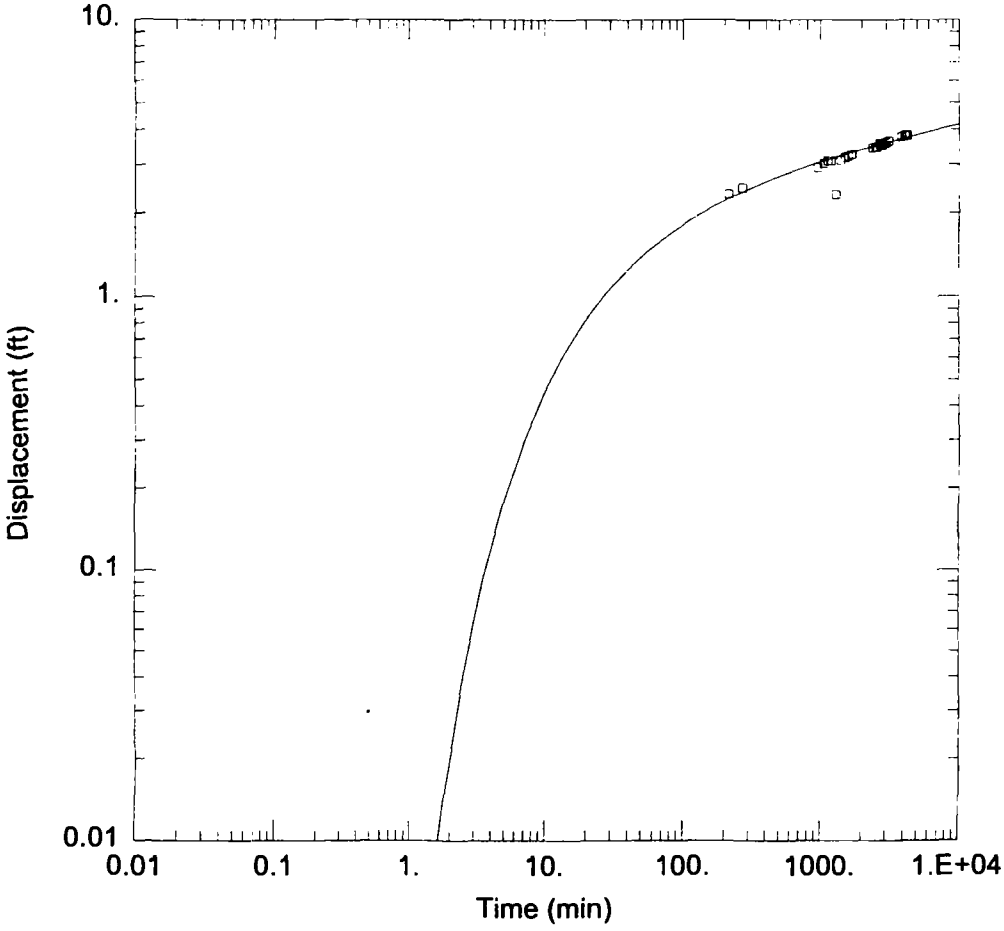
I-1-23 MPE-1C T = 0.15 ft²/min S = 0.046

Cooper-Jacob Solution - Confined Aq.

Same limitations as Theis, plus accuracy of early time data.

I-1-23 MPE-1C T = 0.13 ft²/min S = 0.11

FORM 3113A



CRAB ORCHARD NWR

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPE-1Cd.aqt
Date: 01/10/01 Time: 09:43:50

PROJECT INFORMATION

Test Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MPE-US	5.4	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ MP-1C	5.4	-4

SOLUTION

Aquifer Model: Leaky Solution Method: Hantush

$T = 0.1554\ ft^2/min$ $S = 0.1947$

$\beta = 0.0001$

5

Data Set: H:\DATA\PROJECTS\4781 PreDesignReport\Data\AQTESOLV\I-1-23MPE-1Cd.aqt
Title: Crab Orchard NWR
Date: 01/10/01
Time: 09:44:01

PROJECT INFORMATION

Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: MPE-US

X Location: 5.4 ft
Y Location: 0. ft

No. of pumping periods: 1

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.93

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MP-1C

X Location: 5.4 ft
Y Location: -4. ft

No. of observations: 23

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
215	2.35	1510	3.18	2885	3.57
270	2.48	1600.	3.21	2980.	3.6
955.	2.93	1690	3.26	3100	3.64
1060.	3.03	2395.	3.44	3850.	3.78
1135.	3.09	2500.	3.46	4070.	3.8
1190.	3.09	2585	3.47	4190.	3.83

6

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
1310.	2.34	2710.	3.57	4240.	3.82
1410.	3.11	2800.	3.52		

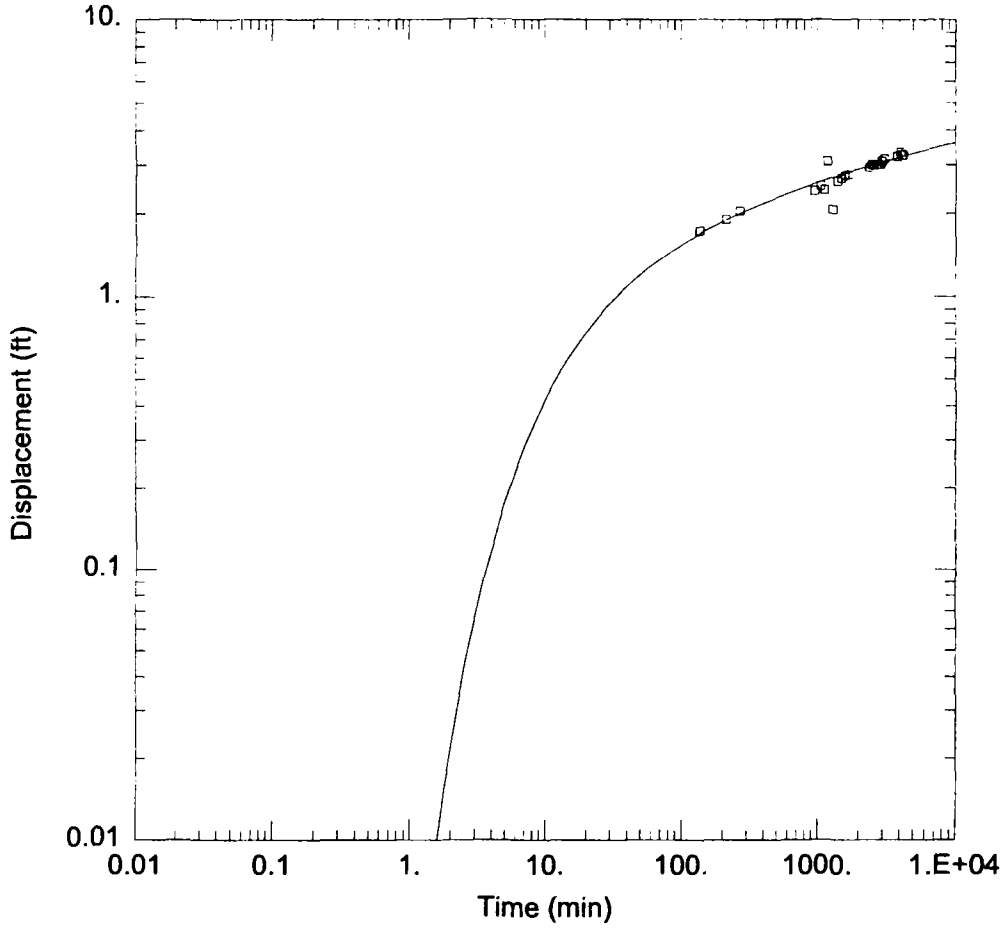
SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.1554	ft^2/min
S	0.1947	
ß	0.0001	



CRAB ORCHARD NWR

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPE-2Cb.aqt
Date: 01/10/01 Time: 10:22:08

PROJECT INFORMATION

Test Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MPE-US	5.4	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ MP-2C	4.75	7.1

SOLUTION

Aquifer Model: Leaky Solution Method: Hantush

T = 0.1672 ft^2/min S = 0.06223
ß = 0.0001

9

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPE-2Cb.aqt
Title: Crab Orchard NWR
Date: 01/10/01
Time: 10:22:00

PROJECT INFORMATION

Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: MPE-US

X Location: 5.4 ft
Y Location: 0. ft

No. of pumping periods: 1

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.93

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MP-2C

X Location: 4.75 ft
Y Location: 7.1 ft

No. of observations: 24

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
138.	1.73	1410	2.62	2800.	3.01
215.	1.91	1510.	2.69	2885.	3.01
270.	2.05	1600.	2.74	2980.	3.09
955.	2.42	1690.	2.77	3100.	3.15
1060.	2.52	2395	2.94	3850.	3.21
1135.	2.44	2500.	3.01	4070	3.32

10

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
1190.	3.09	2585.	2.99	4190.	3.26
1310.	2.07	2710.	3.01	4240.	3.25

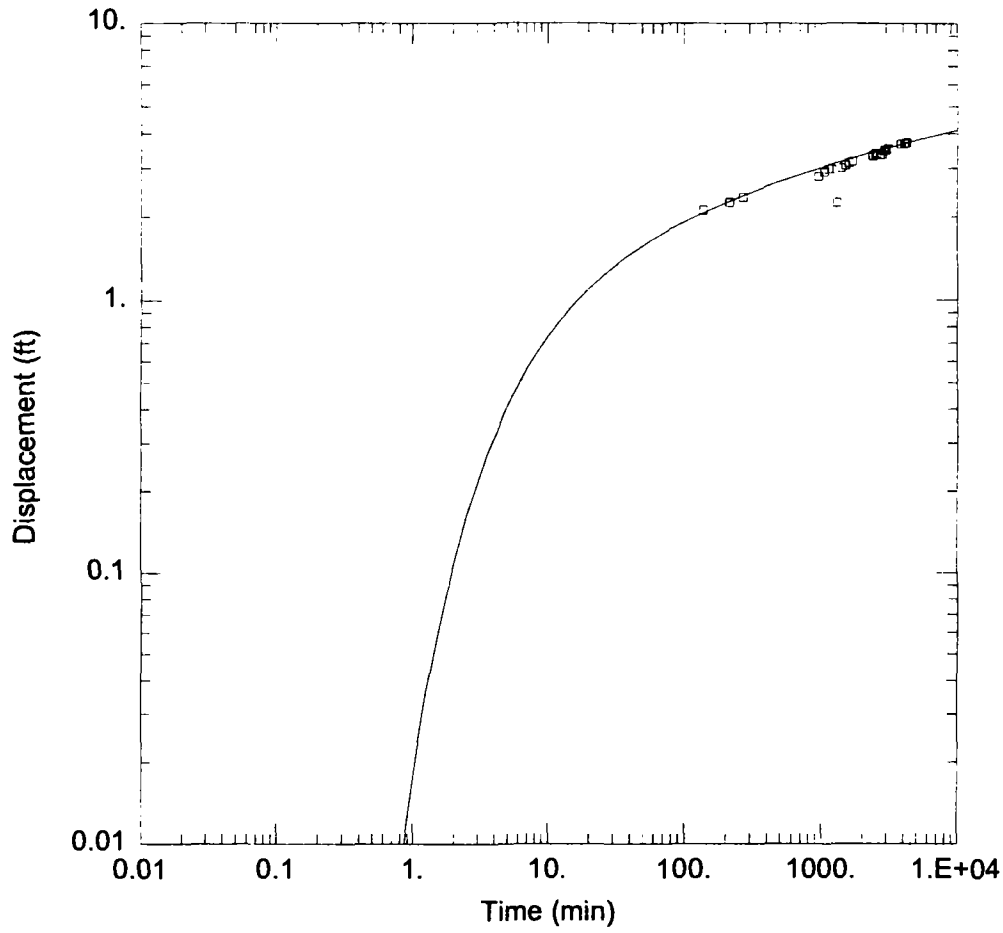
SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.1672	ft^2/min
S	0.06223	
ß	0.0001	



CRAB ORCHARD NWR

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPE-3Cb.aqt
Date: 01/10/01 Time: 10:17:19

PROJECT INFORMATION

Test Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MPE-US	5.4	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ MP-3C	14.55	0

SOLUTION

Aquifer Model: Leaky Solution Method: Hantush

T = 0.1543 ft^2/min S = 0.01924

ß = 0.0001

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPE-3Cb.aqt
Title: Crab Orchard NWR
Date: 01/10/01
Time: 10:17:13

PROJECT INFORMATION

Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: MPE-US

X Location: 5.4 ft
Y Location: 0. ft

No. of pumping periods: 1

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.93

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MP-3C

X Location: 14.55 ft
Y Location: 0. ft

No. of observations: 24

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
138.	2.12	1410.	3.	2800.	3.36
215.	2.26	1510.	3.07	2885.	3.47
270.	2.36	1600.	3.13	2980.	3.49
955.	2.8	1690.	3.17	3100.	3.52
1060.	2.9	2395.	3.32	3850.	3.66
1135.	2.97	2500.	3.38	4070.	3.67

14

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
1190.	2.97	2585.	3.37	4190.	3.7
1310.	2.25	2710.	3.36	4240.	3.71

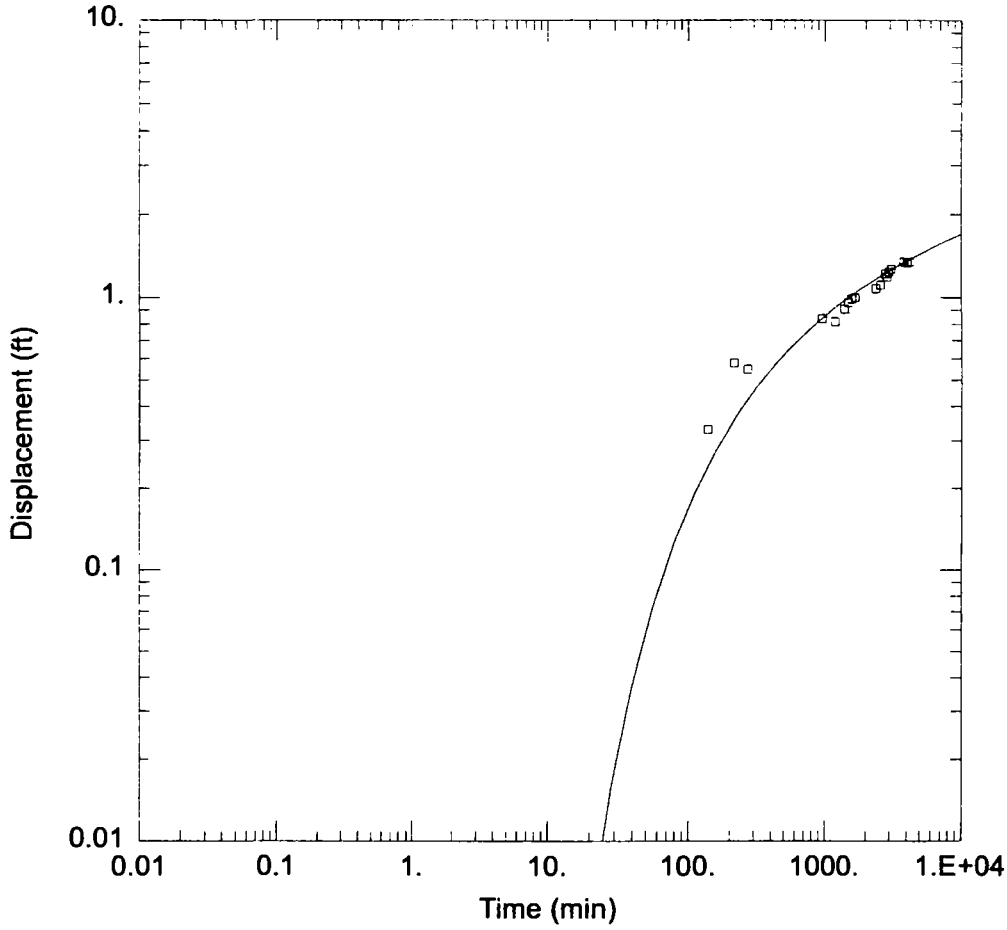
SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.1543	ft^2/min
S	0.01924	
ß	0.0001	



CRAB ORCHARD NWR

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPEMWC-7b.aqt
Date: 01/11/01 Time: 11:17:18

PROJECT INFORMATION

Test Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MPE-US	5.4	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ MWC-7	-38	120

SOLUTION

Aquifer Model: Leaky Solution Method: Hantush

T = 0.1982 ft^2/min S = 0.002921

ß = 0.0001

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPEMWC-7b.aqt
Title: Crab Orchard NWR
Date: 01/11/01
Time: 11:17:13

PROJECT INFORMATION

Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: MPE-US

X Location: 5.4 ft
Y Location: 0. ft

No. of pumping periods: 1

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.93

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MWC-7

X Location: -38. ft
Y Location: 120. ft

No. of observations: 18

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
138.	0.33	1510.	0.96	2885.	1.19
215.	0.58	1600.	0.99	2980.	1.24
270.	0.55	1690.	1.	3100.	1.27
955.	0.84	2395.	1.08	3850.	1.35
1190.	0.82	2585	1.11	4070.	1.34
1410.	0.91	2800.	1.22	4240.	1.35

18

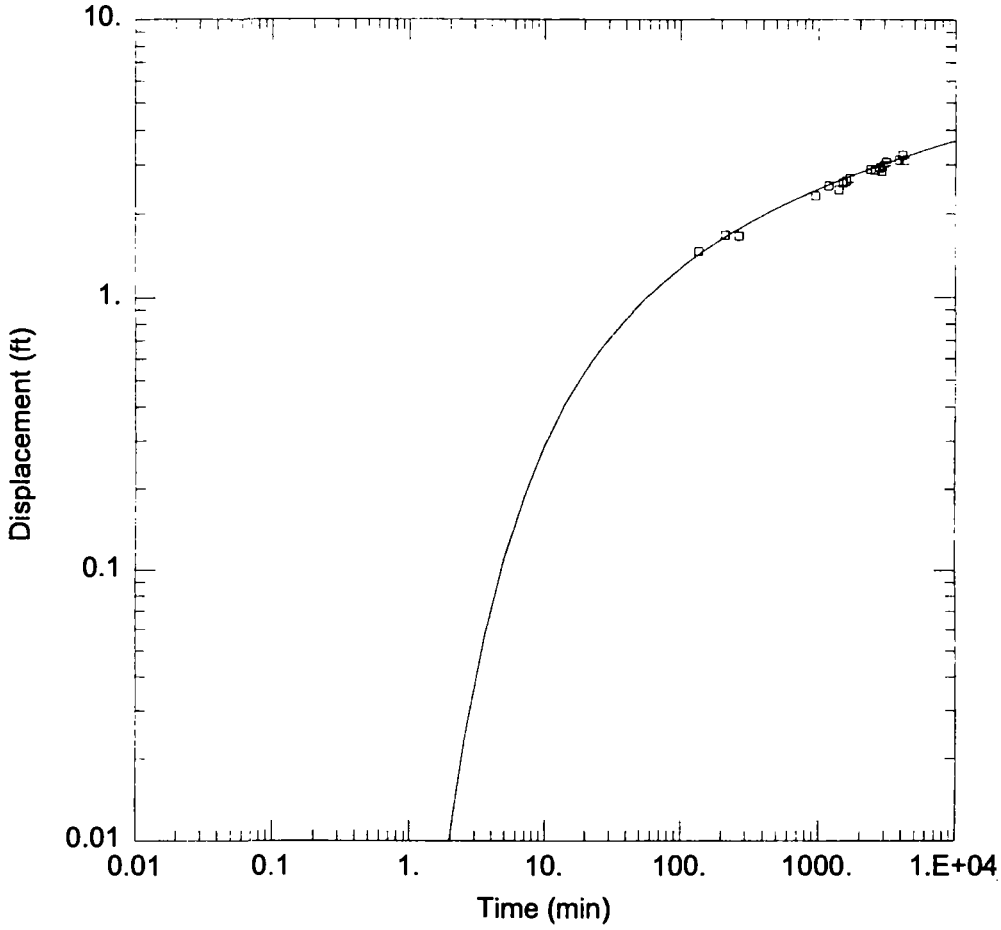
SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.1982	ft^2/min
S	0.002921	
ß	0.1	



CRAB ORCHARD NWR

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPE-MWC-16b.aqt
Date: 01/11/01 Time: 11:08:34

PROJECT INFORMATION

Test Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MPE-US	5.4	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ MWC-16	0	-35

SOLUTION

Aquifer Model: Leaky Solution Method: Hantush

T = 0.1413 ft^2/min S = 0.002564

ß = 0.0001

Data Set: H:\DATA\PROJECTS\4781 PreDesignReport\Data\AQTESOLV\I-1-23MPE-MWC-16b.aqt
Title: Crab Orchard NWR
Date: 01/11/01
Time: 11:08:15

PROJECT INFORMATION

Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: MPE-US

X Location: 5.4 ft
Y Location: 0. ft

No. of pumping periods: 1

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.93

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MWC-16

X Location: 0. ft
Y Location: -35. ft

No. of observations: 18

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
138.	1.47	1510	2.58	2885.	2.84
215.	1.68	1600	2.62	2980.	2.98
270.	1.67	1690.	2.68	3100.	3.06
955.	2.32	2395	2.89	3850.	3.12
1190.	2.52	2585	2.87	4070.	3.25
1410.	2.44	2800	2.93	4240.	3.11

22

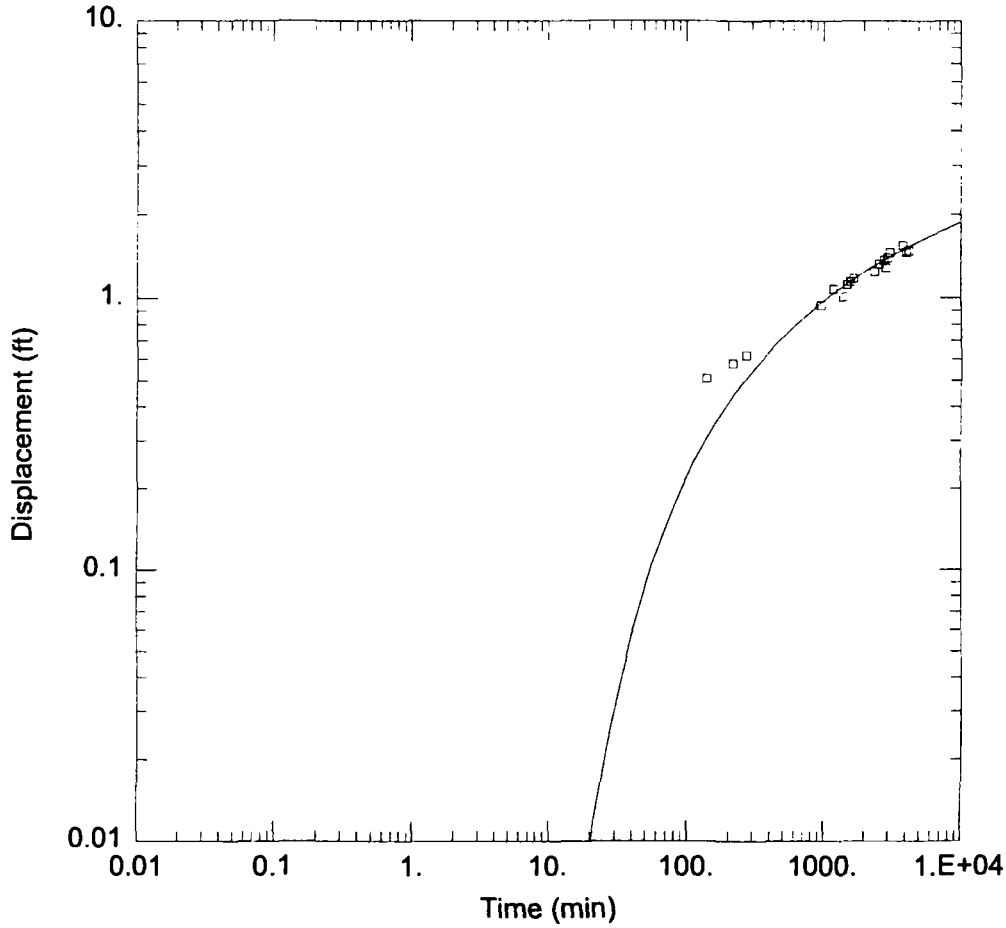
SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.1413	ft^2/min
S	0.002564	
ß	0.1	



CRAB ORCHARD NWR

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPEMWC-21b.aq
Date: 01/11/01 Time: 11:12:39

PROJECT INFORMATION

Test Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MPE-US	5.4	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ MWC-21	-25	100

SOLUTION

Aquifer Model: Leaky Solution Method: Hantush

T = 0.1863 ft^2/min S = 0.003436

ß = 0.0001

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPEMWC-21b.aqt
Title: Crab Orchard NWR
Date: 01/11/01
Time: 11:12:32

PROJECT INFORMATION

Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: MPE-US

X Location: 5.4 ft
Y Location: 0. ft

No. of pumping periods: 1

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.93

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MWC-21

X Location: -25. ft
Y Location: 100. ft

No. of observations: 18

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
138.	0.51	1510	1.12	2885	1.29
215.	0.58	1600.	1.15	2980.	1.4
270.	0.62	1690	1.18	3100.	1.46
955.	0.94	2395	1.25	3850	1.55
1190.	1.08	2585.	1.33	4070.	1.46
1410.	1.01	2800	1.37	4240.	1.48

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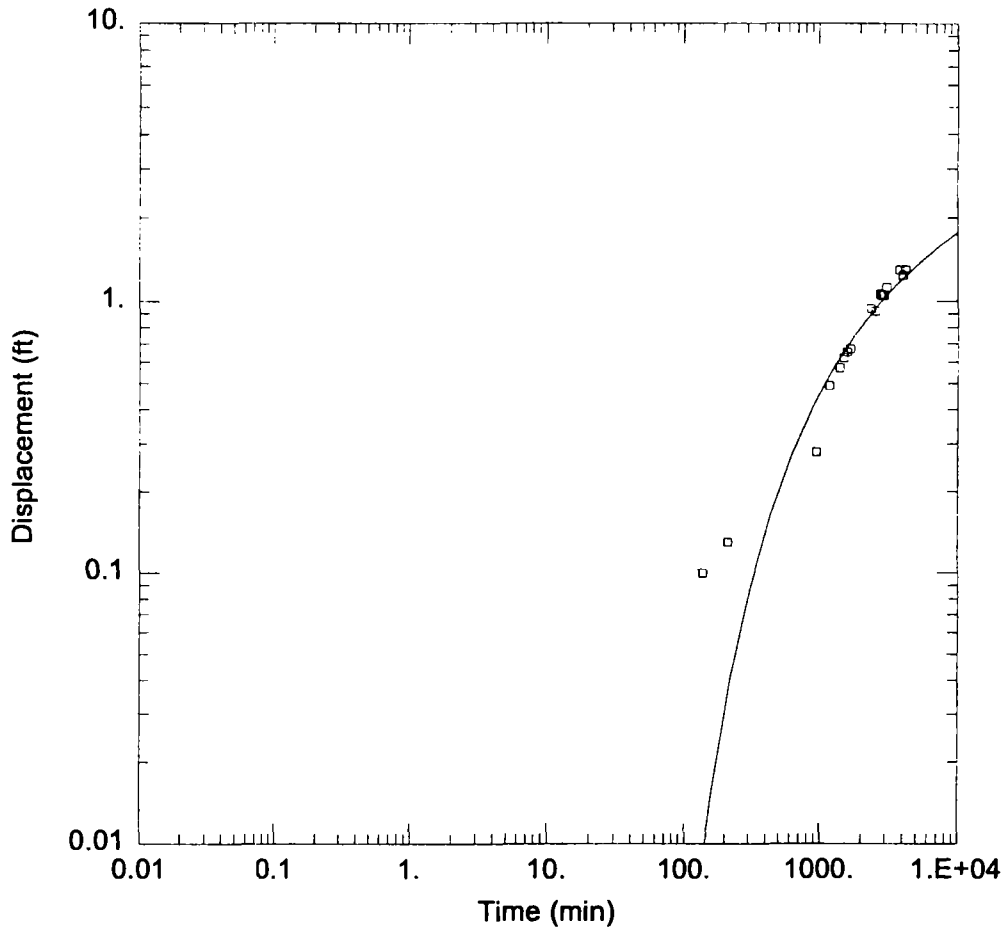
SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.1863	ft^2/min
S	0.003436	
ß	0.1	



CRAB ORCHARD NWR

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\I-1-23MPE-MWC-22b.aqt
Date: 01/11/01 Time: 11:15:20

PROJECT INFORMATION

Test Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MPE-US	5.4	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ MWC-22	-25	109

SOLUTION

Aquifer Model: Leaky Solution Method: Hantush

T = 0.1107 ft^2/min S = 0.01427
ß = 0.0001

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data AQTESOLV\I-1-23MPE-MWC-22b.aqt
Title: Crab Orchard NWR
Date 01/11/01
Time: 11:15:14

PROJECT INFORMATION

Location: I-1-23
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: MPE-US

X Location: 5.4 ft
Y Location: 0. ft

No. of pumping periods: 1

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.93

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MWC-22

X Location: -25. ft
Y Location: 109. ft

No. of observations: 17

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
138.	0.1	1600.	0.65	2980	1.05
215.	0.13	1690.	0.67	3100	1.12
955	0.28	2395	0.94	3850.	1.3
1190.	0.49	2585.	0.92	4070	1.24
1410.	0.57	2800.	1.06	4240.	1.3
1510	0.62	2885.	1.05		

30

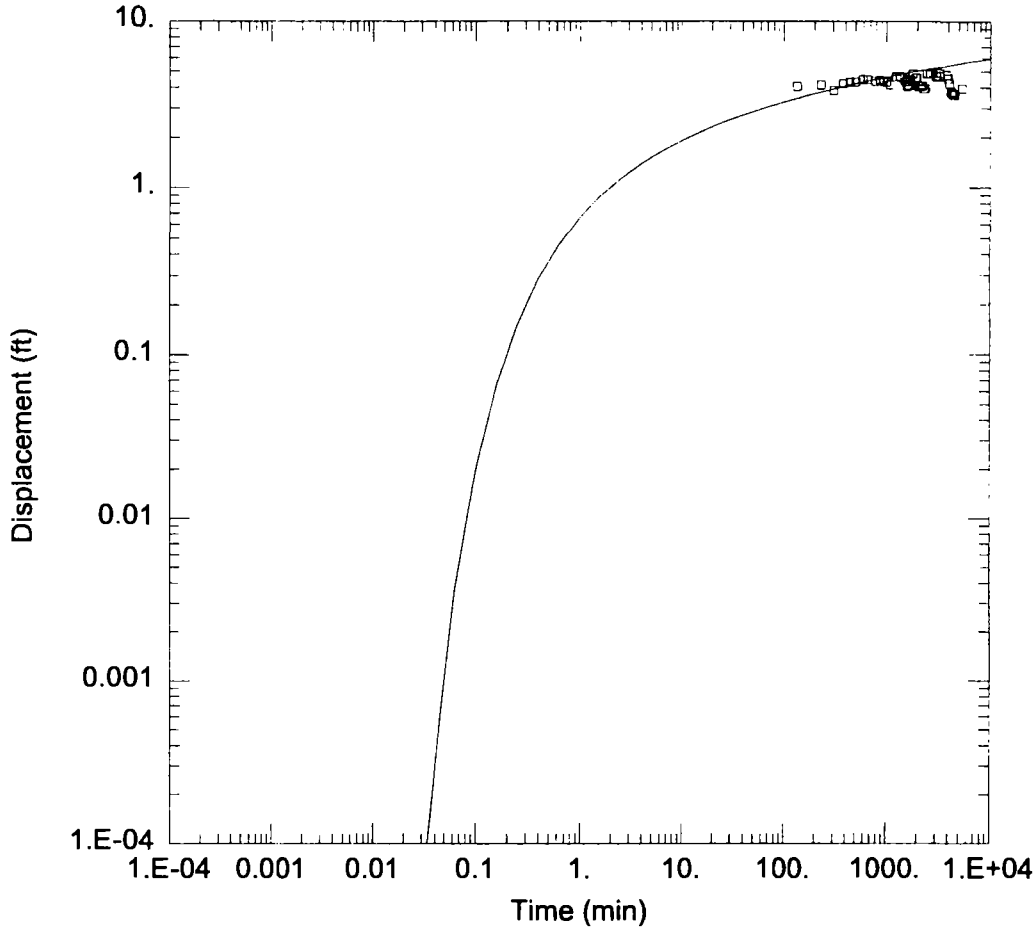
SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.1107	ft^2/min
S	0.01427	
ß	0.0001	



CRAB ORCHARD NWR

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\reposMPE-1Ab.aqt
Date: 01/11/01 Time: 10:13:54

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.07
Test Location: Repository
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 5. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MPE-US	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ MP-1A	0	-3.21

SOLUTION

Aquifer Model: Leaky Solution Method: Hantush

$T = 0.006113\ ft^2/min$ $S = 0.0005405$

ß = 0.0001

33

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\reposMPE-1Ab.aqt
Title: Crab Orchard NWR
Date: 01/11/01
Time: 10:14:04

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.07
Location: Repository
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 5. ft
Anisotropy Ratio (Kz/Kr): 0.1

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: MPE-US

X Location: 0. ft
Y Location: 0. ft

No. of pumping periods: 1

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0	0.0455

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MP-1A

X Location: 0. ft
Y Location: -3.21 ft

No. of observations: 45

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
134.	4.06	1424.	4.57	2474.	4.84
229.	4.14	1494.	4.45	2659.	4.84
304.	3.84	1544.	4.35	2809.	4.92
379.	4.21	1594.	4.08	3004.	4.69

34

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
439.	4.28	1639.	4.15	3069.	4.62
504.	4.3	1714.	4.45	3254.	4.69
589.	4.45	1814.	4.83	3299.	4.9
661.	4.45	1924.	4.58	3894.	4.78
794.	4.34	1979.	4.57	3964.	4.53
874.	4.42	2044.	4.06	4064.	4.23
934.	4.36	2134.	4.08	4224.	3.78
1009.	4.3	2194.	4.05	4339.	3.71
1084.	4.14	2239.	4.11	4459.	3.64
1254.	4.63	2294.	3.93	4549.	3.61
1359.	4.68	2374.	3.94	5344.	3.96

SOLUTION

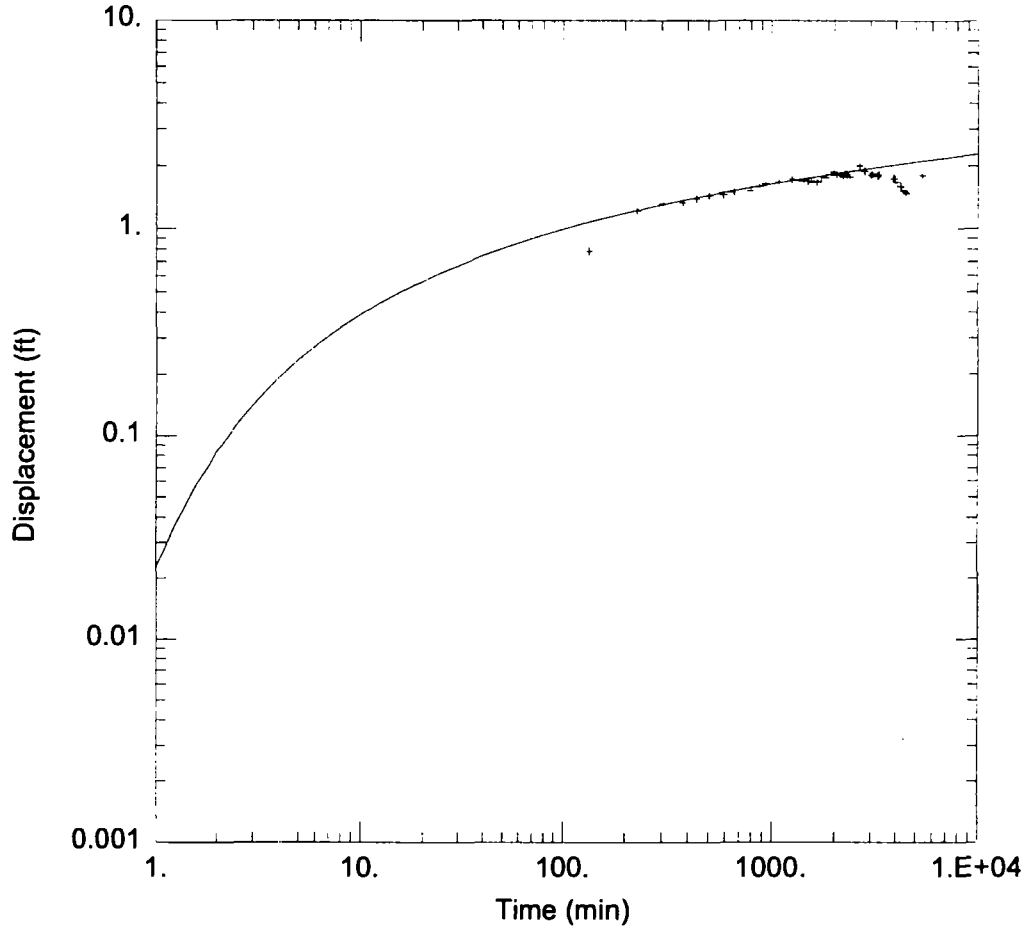
Aquifer Model: Leaky
Solution Method: Hantush

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.006113	ft^2/min
S	0.0005405	
ß	0.0001	

35



CRAB ORCHARD NWR

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\reposMPE-2Ac.aqt
Date: 01/11/01 Time: 08:08:46

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.07
Test Location: Repository
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 2. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MPE-US	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
MP-2A	0	6.5

SOLUTION

37

Aquifer Model: Leaky Solution Method: Hantush

T = 0.01288 ft^2/min S = 0.002015
ß = 0.0001

Data Set: H:\DATA\PROJECTS\4781 PreDesignReport\Data\AQTESOLV\reposMPE-2Ac.aqt
Title: Crab Orchard NWR
Date: 01/11/01
Time: 08:08:40

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.07
Location: Repository
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 2. ft
Anisotropy Ratio (Kz/Kr): 0.1

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: MPE-US

X Location: 0. ft
Y Location: 0. ft

No. of pumping periods: 1

Pumping Period Data

Time (min)	Rate (cu. ft/min)
0.	0.0455

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MP-2A

X Location: 0. ft
Y Location: 6.5 ft

No. of observations: 44

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
134.	0.78	1494.	1.69	2659.	2.
229.	1.22	1544.	1.68	2809.	1.89
304.	1.31	1594.	1.67	3004.	1.8
379.	1.33	1639.	1.67	3069.	1.84

38

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
439.	1.39	1714.	1.69	3254.	1.79
504.	1.43	1814.	1.76	3299.	1.81
589.	1.45	1924.	1.81	3894.	1.74
661.	1.49	1979.	1.86	3964.	1.74
794.	1.52	2044.	1.82	4064.	1.67
874.	1.59	2134.	1.81	4224.	1.59
934.	1.64	2194.	1.79	4339.	1.52
1084.	1.67	2239.	1.83	4459.	1.49
1254.	1.73	2294.	1.81	4549.	1.47
1359.	1.7	2374.	1.77	5344.	1.8
1424.	1.72	2474.	1.89		

SOLUTION

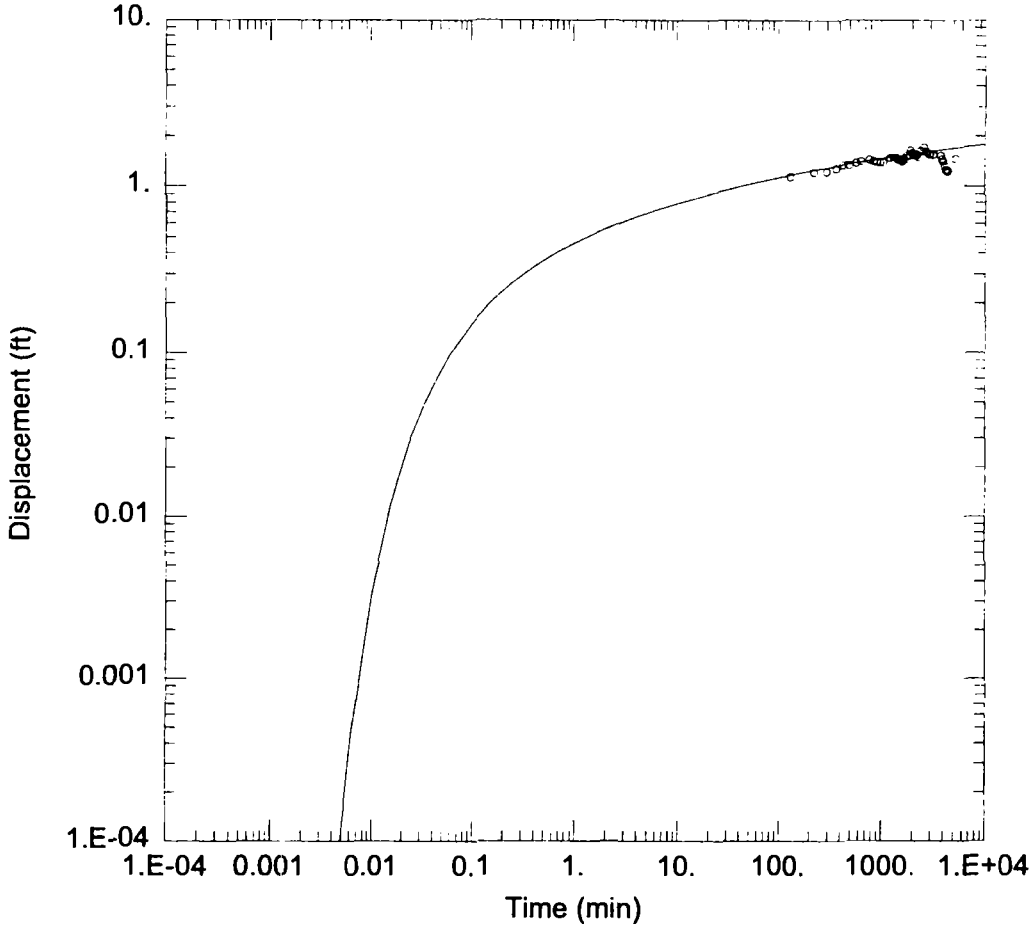
Aquifer Model: Leaky
Solution Method: Hantush

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.01288	ft^2/min
S	0.002015	
ß	0.0001	

39



CRAB ORCHARD NWR

Data Set: H:\DATA\PROJECTS\4781\PreDesignReport\Data\AQTESOLV\reposMPE-3Ab.aqt
Date: 01/10/01 Time: 08:37:17

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.07
Test Location: Crab Orchard NWR
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 2. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MPE-US	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
◦ MP-3A	12.4	0

SOLUTION

41

Aquifer Model: Leaky Solution Method: Hantush

T = 0.02466 ft^2/min S = 1.668E-05

ß = 0.0001

Data Set: H:\DATA\PROJECTS\4781 PreDesignReport\Data\AQTESOLV reposMPE-3Ab.aqt
Title: Crab Orchard NWR
Date: 01/10/01
Time: 08:37:30

PROJECT INFORMATION

Company: RMT
Client: Schlumberger
Project: 4781.07
Location: Crab Orchard NWR
Test Well: MPE-US

AQUIFER DATA

Saturated Thickness: 2. ft
Anisotropy Ratio (Kz/Kr) 0.1

PUMPING WELL DATA

Number of pumping wells: 1

Pumping Well No. 1: MPE-US

X Location: 0. ft
Y Location: 0. ft

No. of pumping periods: 1

Pumping Period Data

Time (min)	Rate (cu ft/min)
0.	0.0455

OBSERVATION WELL DATA

Number of observation wells: 1

Observation Well No. 1: MP-3A

X Location: 12.4 ft
Y Location: 0. ft

No of observations: 45

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
134	1.14	1424.	1.48	2474.	1.63
229.	1.21	1494	1.43	2659	1.71
304.	1.22	1544	1.43	2809.	1.61
379.	1.27	1594	1.43	3004.	1.55

42

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
439.	1.33	1639.	1.4	3069.	1.56
504.	1.33	1714.	1.44	3254.	1.54
589.	1.37	1814.	1.52	3299.	1.55
661.	1.41	1924.	1.52	3894.	1.52
794.	1.44	1979.	1.64	3964.	1.45
874.	1.41	2044.	1.58	4064.	1.41
934.	1.39	2134.	1.55	4224.	1.31
1009.	1.38	2194.	1.55	4339.	1.25
1084.	1.38	2239.	1.52	4459.	1.22
1254.	1.47	2294.	1.55	4549.	1.23
1359.	1.48	2374.	1.48	5344.	1.46

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	0.02466	ft^2/min
S	1.668E-05	
ß	0.0001	

43

Appendix F
Mobile Laboratory VOC Data

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	103-F	103-I	103-L	105-F	105-I	105-N	100-F	100-I	100-L	Fdup 001	102-F	102-K	102-O	Fdup 002	106-F	106-J	106-L	104-F	104-I	104-M	Not Spkd	
Collection Date	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	MS	MSD
Collection Time	11:08	11:23	11:32	11:30	11:52	14:20	16:11	16:42	17:02		16:35	17:47	18:30		8:21	8:55	9:13	8:30	9:00	9:45	#5	#5
ECCS Field ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.25	< 0.10	< 0.50	< 0.25	< 0.05		101%
1,1-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.25	< 0.10	< 0.50	< 0.25	< 0.05		100%
trans-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.25	< 0.10	< 0.50	< 0.25	< 0.05		74%
1,1-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.25	< 0.10	< 0.50	< 0.25	< 0.05		87%
cis-1,2-Dichloroethene	0.089	0.039 J	0.024 J	0.021 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	0.31	0.21 J	0.029 J	0.36	0.18	0.37	0.16	0.56	0.39	0.13		97%
1,1,1-Trichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.25	< 0.10	< 0.50	< 0.25	< 0.05		87%
1,2-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.25	< 0.10	< 0.50	< 0.25	< 0.05		77%
Trichloroethene	0.34	< 0.05	0.17	0.055	< 0.05	0.46	< 0.05	0.067	17	< 0.05	11 F	9.3 F	1.9 F	11 F	0.62	7.9 F	3.8 F	19 F	11 F	2.6 F		90%
Tetrachloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.045 J	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.25	< 0.10	< 0.50	< 0.25	< 0.05		94%
Freon-113	3.4 E	4.6 E	5.5 E	0.51	< 0.05	2.4 E	< 0.05	< 0.05	4.7	< 0.05	< 0.25	0.32	0.89	< 0.25	< 0.05	< 0.25	< 0.10	< 0.50	< 0.25	0.36		
Surrogate(ELCD)	78%	70%	77%	70%	71%	60%	78%	84%	106%	90%	98%	84%	110%	104%	91%	106%	85%	82%	92%	118%		134%
Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.05	< 0.10	< 0.50	< 0.25	< 0.05		99%
Toluene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.05	< 0.10	< 0.50	< 0.25	< 0.05		99%
Ethyl Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.05	< 0.10	< 0.50	< 0.25	< 0.05		99%
M&P Xylenes	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.05	< 0.10	< 0.50	< 0.25	< 0.05		99%
o-Xylene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.05	< 0.05	< 0.10	< 0.50	< 0.25	< 0.05		98%
Surrogate(PID)	85%	88%	85%	89%	84%	84%	87%	89%	99%	90%	133%	86%	98%	92%	92%	81%	91%	101%	84%	97%		88%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Jenkins

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	101-F	101-H	101-J	110-D	110-G	110-I	Fdup 003	110-C	110-F	110-G	109-F	109-I	109-L	111-D	111-G	111-J	113-D	113-G *	113-I	113-H		
Collection Date	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/14/00	9/14/00	9/14/00	9/14/00	MS	MSD
Collection Time	11:18	11:29	11:37	11:29	12:08	12:27		15:12	15:30	15:48	15:08	15:32	15:41	16:40	17:15	17:30	7:54	8:24	8:39		#28	#28
ECCS Field ID	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	0.89	0.78	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	OK	OK
1,1-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	109%	116%
trans-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	0.023 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	93%	121%
1,1-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	84%	91%
cis-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	1.7	3.2	3.9 F	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		0.043 J	0.035 J	74%	90%
1,1,1-Trichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	87%	93%
1,2-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	95%	93%
Trichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	1.7	8.1 F	11 F	< 0.05	< 0.05	0.064	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	77%	104%
Tetrachloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.21 J	< 0.25	0.28	0.025 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	84%	86%
Freon-113	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		
Surrogate(ELCD)	101%	97%	85%	118%	94%	100%	90%	77%	84%	92%	95%	96%	103%	107%	100%	101%	92%		107%	114%	103%	112%
Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	100%	102%
Toluene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	101%	101%
Ethyl Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	102%	103%
M&P Xylenes	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	102%	104%
o-Xylene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	103%	105%
Surrogate(PID)	92%	96%	89%	93%	96%	98%	94%	88%	87%	87%	89%	90%	87%	98%	97%	95%	89%		91%	96%	104%	105%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

* = VOC vial broke #40 is replacement.

Signature Block

Michael Trustine

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	408-G	408-L	408-N	120-E	120-G	120-I	Fdup 004	107-F	107-H	107-J	409-H	409-R	Fdup 005	409-U *	109-F	109-I	109-L	409-I	413-I	413-R		
Collection Date	9/14/00	9/14/00	9/14/00	9/14/00	9/14/00	9/14/00	9/14/00	9/14/00	9/14/00	9/14/00	9/14/00	9/14/00	9/14/00	9/14/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	MS	MSD
Collection Time	8:52	9:17	9:34	10:17	10:32	10:47		13:30	14:44	15:00	12:56	14:02		14:37	8:10	8:40	8:57		8:21	9:11	#48	#48
ECCS Field ID	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	107%	99%
1,1-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	103%	98%
trans-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	107%	99%
1,1-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	114%	101%
cis-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	1.0	0.99	1.1	1.5	< 0.05	< 0.05	0.041 J	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	119%	107%
1,1,1-Trichloroethane	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	105%	97%
1,2-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	89%	85%
Trichloroethene	< 0.05	0.15	0.56	1.7	1.6	5.0	6.1	< 0.05	< 0.05	< 0.05	< 0.05	8.8	8.2		< 0.05	< 0.05	< 0.05	2.5	< 0.05	9.3	106%	100%
Tetrachloroethene	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	0.49 J	0.42 J		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	0.76 J	119%	107%
Freon-113	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0		
Surrogate(ELCD)	83%	79%	78%	86%	65%	DO	DO	83%	107%	61%	78%	84%	79%		78%	70%	69%	82%	92%	110%	78%	75%
Benzene	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	0.031 J	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	99%	98%
Toluene	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	101%	99%
Ethyl Benzene	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	101%	99%
M&P Xylenes	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	0.022 J	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	103%	100%
o-Xylene	< 0.05	< 0.05	< 0.05	< 0.25	< 0.25	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.50		< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 1.0	100%	98%
Surrogate(PID)	82%	91%	90%	81%	74%	DO	DO	99%	92%	83%	86%	92%	90%		85%	84%	82%	82%	83%	85%	87%	89%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

* = Broke in centrifuge.

Signature Block

Michael Funckes

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	413-T	Pdup 006	119-D	119-G	119-I	410-I	410-O	410-U	121-C	121-K	121-R	Pdup 007	414-J	414-Q	414-T	114-D	114-G	114-I	114-P	410-N		
Collection Date	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/15/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	MB	MSD
Collection Time	9:40		10:06	10:29	10:43	11 22	12.53	13 50	13:20	14 30	15:36		15:39	16.26	16:49	7.50	8.06	8 18	9.10	8.41	878	878
ECCS Field ID	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	75%	85%
1,1-Dichloroethene	< 0.05	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	96%	106%
trans-1,2-Dichloroethene	< 0.05	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	94%	107%
1,1-Dichloroethane	< 0.05	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	96%	106%
cis-1,2-Dichloroethene	0.32	< 0 50	< 0.05	< 0 05	< 0 05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.05	0.18 J	0.025 J	82%	91%
1,1,1-Trichloroethane	< 0 05	< 0 50	< 0.05	< 0 05	< 0 05	< 0.05	< 0.05	< 1 0	< 0.05	< 0 05	< 0.50	< 0.50	< 0.05	< 1 0	< 1 0	< 0.05	< 0 05	< 0 05	< 0 25	< 0 05	97%	107%
1,2-Dichloroethane	< 0.05	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	76%	94%
Trichloroethene	0.086	9.2	< 0.05	< 0.05	< 0.05	< 0.05	0.56	17	< 0.05	< 0.05	4.1	4.1	< 0.05	20	13	< 0.05	< 0.05	< 0.05	2.0	1.1	95%	112%
Tetrachloroethene	< 0.05	0.89	< 0.05	< 0.05	< 0.05	< 0.05	0.024 J	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0 05	< 1 0	0.47 J	< 0.05	< 0.05	< 0.05	< 0 25	< 0.05	106%	121%
Freon-113	< 0 05	< 0 50	< 0 05	< 0.05	< 0.05	< 0.05	< 0 05	< 1 0	< 0 05	< 0 05	< 0.50	< 0.50	< 0 05	< 1.0	< 1 0	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05		
Surrogate(ELCD)	65%	101%	91%	94%	86%	79%	96%	87%	61%	76%	76%	72%	85%	DO	DO	86%	61%	63%	76%	68%	79%	80%
Benzene	< 0.05	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	98%	99%
Toluene	< 0.05	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0 05	< 0.25	< 0.05	100%	101%
Ethyl Benzene	< 0.05	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	101%	102%
M&P Xylenes	< 0.05	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	102%	102%
o-Xylene	< 0.05	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	98%	99%
Surrogate(PID)	66%	107%	89%	86%	90%	84%	90%	81%	66%	84%	DO	76%	94%	DO	DO	94%	77%	76%	87%	76%	86%	88%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Fricke

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	416-F	416-T	Fdup 008	112-D	112-H	112-K	Fdup 009 *	112-N	415-G	415-P	415-S	415-U	Fdup 010	115-N	115-O	115-I	115-M	115-P	118-D	118-G		
Collection Date	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	9/16/00	MS	MSD
Collection Time	7:56	9:37		11:03	11:19	11:42		13:00	12:45	13:31	14:01	14:24		15:00	13:55	14:25	15:00	15:40	16:42	17:00	#100	#100
ECCS Field ID	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100		
Target Analyte																						
Vinyl Chloride	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	88%	78%
1,1-Dichloroethene	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	113%	111%
trans-1,2-Dichloroethene	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	116%	111%
1,1-Dichloroethane	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	123%	116%
cis-1,2-Dichloroethene	< 0.05	< 1.0	< 1.0	< 0.05	0.18	0.18		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	0.55	0.077	0.16	0.41 J	0.92 J	< 0.05	< 0.05	109%	105%
1,1,1-Trichloroethane	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	125%	120%
1,2-Dichloroethane	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	106%	103%
Trichloroethene	< 0.05	14	13	< 0.05	0.42	2.2		9.9	< 0.05	0.032 J	23 F	15 F	28 F	14	0.83	0.76	9.5	22	< 0.05	< 0.05	130%	122%
Tetrachloroethene	< 0.05	0.51 J	0.51 J	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	2.0	< 0.50	2.1	0.20 J	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	150%	142%
Freon-113	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05		
Surrogate(ELCD)	68%	DO	DO	73%	74%	92%		DO	78%	85%	DO	DO	85%	84%	87%	77%	70%	DO	67%	62%	87%	89%
Benzene	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	100%	100%
Toluene	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	99%	98%
Ethyl Benzene	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	101%	100%
M&P Xylenes	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	101%	100%
o-Xylene	< 0.05	< 1.0	< 1.0	< 0.05	< 0.05	< 0.25		< 1.0	< 0.05	< 0.05	< 0.50	< 0.50	< 0.50	< 0.50	< 0.05	< 0.05	< 0.50	< 1.0	< 0.05	< 0.05	100%	99%
Surrogate(PID)	77%	DO	DO	79%	86%	88%		DO	80%	93%	DO	DO	91%	99%	92%	88%	95%	DO	82%	83%	93%	93%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

* = Broke in centrifuge replaced with new 009 dup.

Signature Block

Michael Tinsley

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	116-K	412-J	412-S	412-T	117-C	117-G	117-J	210-E	210-G	210-I	4111-I	411-Q	411-S	Pdup 011	207-E	207-G	207-I	408-E	408-O	408-S	MB	MSD
Collection Date	9/16/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00	9/17/00		
Collection Time	17:56	7:31	8:46	8:46	8:00	8:20	8:40	10:30	10:40	10:50	10:30	11:20	11:37		13:52	14:04	14:19	14:41	15:26	16:01	#115	#115
ECCS Field ID	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.05	< 0.50	< 0.50	0.13 J	0.049 J	0.032 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.13 J	46%	48%
1,1-Dichloroethene	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	2.1	1.3 E	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	93%	104%
trans-1,2-Dichloroethene	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	93%	104%
1,1-Dichloroethane	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	0.18	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	107%	108%
cis-1,2-Dichloroethene	0.067	< 0.05	< 0.50	< 0.50	1.1	0.29	0.48	0.025 J	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	0.064	0.17 J	96%	101%
1,1,1-Trichloroethane	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	0.56	0.48	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	98%	112%
1,2-Dichloroethane	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	0.025 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	102%	116%
Trichloroethene	0.63	< 0.05	18	12	1.7	0.26	0.29	0.039 J	0.22	0.86	< 0.05	1.9	100	120 E	< 0.05	< 0.05	< 0.05	< 0.05	0.95	4.3	94%	107%
Tetrachloroethene	< 0.05	< 0.05	3.6 B	1.3 B	< 0.25	0.041 JB	0.020 JB	< 0.05	< 0.05	< 0.05	< 0.05	0.074 JB	2.6 JB	2.6 JB	< 0.05	0.033 JB	< 0.05	< 0.05	0.053 JB	0.18 JB	96%	113%
Freon-113	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	1.1	0.64	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25		
Surrogate(ELCD)	74%	79%	DO	77%	68%	85%	76%	72%	74%	63%	73%	91%	DO	DO	84%	105%	88%	70%	65%	70%	91%	107%
Benzene	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.028 J	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	0.031 J	< 0.05	< 0.25	98%	100%
Toluene	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	102%	104%
Ethyl Benzene	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	12%	104%
M&P Xylenes	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	< 5.0	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	102%	104%
o-Xylene	< 0.05	< 0.05	< 0.50	< 0.50	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.12	3.0 J	3.3 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	102%	104%
Surrogate(PID)	91%	88%	94%	86%	79%	86%	88%	88%	90%	78%	81%	79%	DO	DO	90%	88%	86%	77%	80%	80%	91%	107%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Fischer

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	203-D	203-E	203-H	203-J	200-E	200-H	200-K	407-G	407-O	407-S	201-D	201-E	201-I	201-K	405-E	405-O	405-U	202-F	202-G	202-J		
Collection Date	9/17/00	9/17/00	9/17/00	9/17/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	9/18/00	MS	MSD
Collection Time	16:12	16:28	16:40	16:58	8:17	8:27	8:49	8:25	9:57	10:19	10:32	10:42	11:09	11:22	11:50	13:51	14:33	14:10	14:20	14:35	#135	#135
ECCS Field ID	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140		
Target Analyte																						
Vinyl Chloride	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	0.54 J	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	58%	60%
1,1-Dichloroethene	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	101%	99%
trans-1,2-Dichloroethene	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	103%	103%
1,1-Dichloroethane	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	115%	118%
cis-1,2-Dichloroethene	2.7	2.4	0.57	0.42	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	6.9	3.5	0.90	0.42	< 0.05	< 0.05	< 0.05	4.9	5.3	3.0	109%	107%
1,1,1-Trichloroethane	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	113%	114%
1,2-Dichloroethane	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	109%	113%
Trichloroethene	3.6	4.3	4.9	2.6 E	< 0.05	< 0.05	< 0.05	< 0.05	0.035 J	13	15	8.0	4.1	2.0	< 0.05	< 0.05	0.27	12	19	11	107%	98%
Tetrachloroethene	0.10 JB	0.12 JB	0.40 B	0.095	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	5.1 B	7.8	1.7 B	0.33 B	0.22 JB	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	0.41 JB	103%	114%
Freon-113	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0		
Surrogate(ELCD)	65%	OK	OK	87%	86%	90%	91%	87%	84%	DO	DO	DO	86%	83%	73%	64%	73%	DO	DO	DO	113%	99%
Benzene	0.49	0.49	0.23 J	0.032 J	< 0.05	< 0.05	< 0.05	0.038 J	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	94%	91%
Toluene	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	97%	93%
Ethyl Benzene	8.7 E	8.7	3.1	0.42	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	0.87 J	1.0	0.81 J	98%	94%
M&P Xylenes	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	99%	95%
o-Xylene	< 0.25	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 1.0	< 1.0	< 1.0	98%	97%
Surrogate(PID)	79%	77%	74%	89%	81%	89%	88%	80%	83%	DO	DO	DO	79%	82%	84%	84%	88%	DO	DO	DO	92%	91%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Jenkins

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	Fdup 013	403-E	403-J	403-O	400-C	400-F	400-I	208-E	208-I	208-L	401-C	401-I	401-M	Fdup 015	402-C	402-F	402-M	Fdup 016	209-F	209-H		
Collection Date	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	MS	MSD
Collection Time		15:35	15:53	16:42	8:25	8:36	8:42	7:53	8:17	8:32	10:12	10:40	11:08		12:51	12:56	13:51		11:20	11:30	#148	#148
ECCS Field ID	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160		
Target Analyte																						
Vinyl Chloride	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.031 J	< 0.05	96%	87%
1,1-Dichloroethene	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	100%	98%
trans-1,2-Dichloroethene	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	98%	100%
1,1-Dichloroethane	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	104%	112%
cis-1,2-Dichloroethene	2.0	< 0.05	0.067	0.38	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.041 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	0.068	100%	99%
1,1,1-Trichloroethane	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	98%	110%
1,2-Dichloroethane	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	96%	95%
Trichloroethene	6.1	< 0.05	2.1 D	5.2 D	< 0.05	< 0.05	< 0.05	< 0.05	0.22	0.47	< 0.05	0.46	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	6.1	0.19	102%	109%
Tetrachloroethene	< 1.0	0.023 JB	0.49 B	1.3 B	0.035 JB	< 0.05	< 0.05	< 0.05	0.020 JB	0.043 JB	< 0.05	0.034 JB	< 0.05	< 0.05	< 0.05	< 0.05	0.038 JB	0.035 JB	0.39 JB	< 0.05	114%	124%
Freon-113	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05		
Surrogate(ELCD)	DO	72%	70%	71%	60%	62%	92%	90%	67%	98%	104%	102%	102%	100%	96%	94%	103%	119%	83%	73%	138%	148%
Benzene	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	100%	101%
Toluene	< 1.0	0.031 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	104%	104%
Ethyl Benzene	0.51 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	102%	104%
M&P Xylenes	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	104%	104%
o-Xylene	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	100%	101%
Surrogate(PID)	DO	91%	88%	91%	78%	80%	98%	96%	91%	97%	94%	93%	95%	93%	94%	99%	95%	92%	98%	93%	87%	91%

J = Estimated
E = Exceeds calibration range
F = Result from FID Analysis
B = Analyte found in associated blank.
ND = Not detected.
DO = Diluted out.
D = Result from dilution.

Signature Block

Michael Lindsey

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	208-J	Fdup 014	404-C	404-H	404-L	209-E	209-H	209-J	205-E	205-H	205-K	502-B	502-G	502-K	212-F	212-I	212-J	Fdup 017	504-B	504-G		
Collection Date	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/19/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	MS	MSD
Collection Time	12:50		14:36	14:58	15:16	14:07	15:20	15:32	7:42	7:52	8:15	7:38	8:15	8:40	9:52	10:20	10:20		9:48	10:17	#166	#166
ECCS Field ID	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	0.033 J	< 0.25	0.050	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	53%	55%
1,1-Dichloroethene	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	104%	102%
trans-1,2-Dichloroethene	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	109%	106%
1,1-Dichloroethane	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	116%	102%
cis-1,2-Dichloroethene	0.023 J	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	97%	87%
1,1,1-Trichloroethane	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	108%	105%
1,2-Dichloroethane	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.036 J	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	109%	102%
Trichloroethene	0.57	2.3	< 0.05	< 0.05	< 0.05	0.048 J	0.45	2.4	0.37	0.022 J	0.15	< 0.05	< 0.05	< 0.05	44 F	28 F	17 F	22 F	< 0.05	< 0.05	115%	110%
Tetrachloroethene	< 0.05	0.11 J	0.022 JB	< 0.05	0.026 JB	0.022 JB	0.029 JB	0.17 JB	0.051 B	0.050 B	0.030 JB	0.0131 JB	0.36	0.18	3.6 F	1.5 F	< 2.5	1.7 F	0.10	0.32	108%	109%
Freon-113	3.4 E	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05		
Surrogate(ELCD)	67%	82%	71%	70%	83%	91%	104%	89%	108%	100%	75%	73%	77%	97%	DO	DO	DO	DO	66%	73%	105%	96%
Benzene	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	93%	93%
Toluene	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	96%	96%
Ethyl Benzene	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	98%	98%
M&P Xylenes	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	99%	99%
o-Xylene	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 2.5	< 2.5	< 2.5	< 0.05	< 0.05	98%	97%
Surrogate(PID)	86%	76%	80%	80%	84%	86%	90%	82%	87%	86%	74%	82%	84%	91%	DO	DO	DO	DO	133%	78%	98%	96%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Fenchner

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	504-K	Fdup 018	503-B	503-D	503-H	Fdup 019	211-E	211-G	211-J	Fdup 020	213-E	213-H	213-K	204-E	204-H	204-K	215-F	215-I	215-L	215-K		
Collection Date	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	9/20/00	MB	MSD
Collection Time	10:40		12.31	12.36	12:56		14:00	14 10	14:30		8:42	8 53	9.30	9 57	10:04	10 23	13:46	14:06	14:15	14 15	#185	#186
ECCS Field ID	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200		
Target Analyte																						
Vinyl Chloride	< 0 05	< 0.05	< 0.05	< 0 05	< 0 05	< 0.05	< 0.05	< 0.05	< 0.05	< 0 05	< 0.05	< 0 05	< 0 05	< 0.05	< 0.05	< 0 25	< 0.10	< 0.05	< 0.05	< 0 05	OK	88%
1,1-Dichloroethene	< 0.05	< 0.05	< 0 05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0 10	< 0.05	< 0.05	< 0.05	116%	92%
trans-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0 05	< 0 05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.10	< 0.05	< 0.05	< 0.05	111%	94%
1,1-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.10	< 0.05	< 0.05	< 0.05	OK	111%
cis-1,2-Dichloroethene	< 0.05	< 0.05	< 0 05	< 0 05	< 0 05	< 0.05	< 0 05	< 0.05	< 0.05	< 0.05	< 0.05	0.036 J	0.030 J	0.17	0.090	0.29	0.066 J	0.041 J	0.047 J	0.051	93%	97%
1,1,1-Trichloroethane	< 0 05	< 0 05	< 0 05	< 0 05	< 0 05	< 0 05	< 0 05	< 0 05	< 0 05	< 0 05	< 0 05	< 0.05	< 0.05	< 0 05	< 0.05	< 0.25	< 0.10	< 0.05	< 0 05	< 0 05	OK	100%
1,2-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0 05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0 05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.10	< 0.05	< 0.05	< 0.05	OK	116%
Trichloroethene	< 0.05	< 0.05	< 0.05	< 0 05	< 0 05	< 0.05	0.45	0.19	0.31	0.29	< 0.05	< 0.05	0.79	0.099	0.068	1.7	0.68	0.32	0.28	0.34	110%	101%
Tetrachloroethene	0.42	0.034 J	< 0.05	< 0 05	< 0.05	< 0.05	0.061	< 0 05	0.022 J	< 0 05	< 0 05	< 0.05	0.13	< 0 05	< 0.05	< 0.25	< 0 10	< 0 05	< 0 05	< 0 05	116%	100%
Freon-113	< 0.05	< 0.05	< 0.05	< 0 05	< 0.05	< 0.05	< 0 05	< 0 05	< 0 05	< 0.05	< 0.05	< 0 05	< 0 05	< 0.05	< 0.05	< 0 25	< 0.10	< 0.05	< 0.05	< 0 05	OK	110%
Surrogate(ELCD)	70%	74%	70%	69%	73%	68%	82%	98%	80%	69%	92%	94%	93%	103%	84%	74%	86%	90%	82%	91%	88%	104%
Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0 25	< 0.10	< 0.05	< 0 05	< 0.05	98%	98%
Toluene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.10	< 0.05	< 0 05	< 0.05	101%	98%
Ethyl Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.025 J	< 0.05	< 0 05	0.58	< 0.10	< 0.05	< 0.05	< 0.05	103%	100%
M&P Xylenes	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.10	< 0.05	< 0.05	< 0.05	103%	100%
o-Xylene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.10	< 0.05	< 0.05	< 0.05	94%	99%
Surrogate(PID)	79%	83%	79%	84%	80%	80%	81%	90%	78%	79%	92%	86%	89%	89%	89%	86%	88%	87%	80%	87%	77%	98%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Tuestuna

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	214-E	214-H	214-J	Fdup 021	216-E	216-G	216-J	Fdup 022	124-D	124-M	124-Q	217-E	214-J	217-T	217-V	122-F	122-I	122-L	127-D	127-H		MS	MSD
Collection Date	9/26/00	9/26/00	9/26/00	9/26/00	9/26/00	9/26/00	9/26/00	9/26/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00			
Collection Time	13:55	14:16	14:33		16:15	16:25	16:36		8:05	8:57	9:30	7:55	9:23	9:50	10:11	10:47	11:08	11:16	11:18	11:41		#208	#208
ECCS Field ID	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220			
Target Analyte																							
Vinyl Chloride	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	0.59 J		112%	130%
1,1-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		104%	111%
trans-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		104%	109%
1,1-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		113%	140%
cis-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.14	0.23	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	0.022 J	1.5	5.9		101%	97%
1,1,1-Trichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		109%	139%
1,2-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		115%	115%
Trichloroethene	0.023 J	0.24	1.7	0.022 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	1.8	2.4	< 0.05	0.044 J	28	< 0.05	< 0.05	< 0.05	0.34	8.0	26		104%	105%
Tetrachloroethene	< 0.05	0.028 J	0.28	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	24	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		103%	108%
Freon-113	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	0.12	< 0.50	< 1.0			
Surrogate(ELCD)	89%	88%	86%	84%	81%	93%	95%	88%	94%	96%	96%	94%	97%	DO	96%	106%	OK	90%	92%	DO		98%	92%
Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		101%	100%
Toluene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		101%	102%
Ethyl Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		102%	103%
M&P Xylenes	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		103%	103%
o-Xylene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 1.0		101%	98%
Surrogate(PID)	87%	89%	84%	86%	83%	91%	91%	91%	92%	97%	89%	95%	94%	DO	92%	95%	91%	89%	89%	DO		98%	88%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael [illegible]

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	127-J	Fdup 023	126-B	126-G	126-N	126-U	Fdup 024	130-D	130-J	130-O	130-V	130-X	126-W	126-F	126-O	126-S	126-X	127-U	127-W	115-R		
Collection Date	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/27/00	9/28/00	9/28/00	9/27/00	9/28/00	9/28/00	9/28/00	9/28/00	9/28/00	9/28/00	9/28/00	MS	MSD
Collection Time	12:41		13:27	13:43	14:12	15:20		14:50	15:42	16:45	9:16	10:09	15:32	9:01	10:05	13:30	12:48	14:48	15:09	15:55	#218	#218
ECCS Field ID	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240		
Target Analyte																						
Vinyl Chloride	0.55 J	0.81 J	< 5.0	< 0.05	0.34 JB	< 5.0	< 25	0.025 JB	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	0.079 B	0.58 JB	0.24 JB	< 0.05	< 0.05	< 0.05	< 0.50	88%	90%
1,1-Dichloroethane	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	94%	96%
trans-1,2-Dichloroethene	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	94%	96%
1,1-Dichloroethane	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	104%	99%
cis-1,2-Dichloroethene	4.0	5.5	< 5.0	0.17	0.27	< 5.0	< 25	< 0.05	< 0.05	0.71	< 0.05	0.020 J	< 0.05	0.63	5.2	2.4	< 0.05	< 0.05	< 0.05	0.24 J	99%	100%
1,1,1-Trichloroethane	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	99%	99%
1,2-Dichloroethane	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	3.9	< 0.05	< 0.05	< 0.05	< 0.50	110%	112%
Trichloroethene	19	24	82	0.63	21 E	150	350	< 0.05	< 0.05	1.5	< 0.05	0.032 J	1.1	0.14	27	0.14 J	< 0.05	< 0.05	< 0.05	11	103%	106%
Tetrachloroethene	< 1.0	< 1.0	4.9 J	0.021 J	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	107%	103%
Freon-113	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	101%	102%
Surrogate(ELCD)	DO	DO	DO	93%	100%	DO	DO	90%	91%	91%	87%	95%	86%	103%	100%	103%	OK	99%	103%	86%	96%	104%
Benzene	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	100%	101%
Toluene	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	99%	100%
Ethyl Benzene	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	101%	102%
M&P Xylenes	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 1.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	102%	103%
o-Xylene	< 1.0	< 1.0	< 5.0	< 0.05	< 0.50	< 5.0	< 25	< 0.05	< 0.05	< 0.10	< 0.05	< 0.05	0.041 JB	< 0.05	< 1.0	< 0.05	0.13 B	< 0.05	< 0.05	< 0.50	101%	102%
Surrogate(PID)	DO	DO	DO	-	95%	DO	DO	91%	92%	92%	84%	90%	89%	93%	97%	93%	92%	90%	91%	90%	98%	99%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Tuckerman

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	115-V	129-D	129-H	129-K	129-U	131-D	131-E	131-P	131-W	Fdup 025	206-X *	206-W *	119-O	119-S	123-E	123-G	123-J	123-O	Fdup 027	Fdup 028	MS	MSD
Collection Date	9/28/00	9/29/00	9/29/00	9/29/00	9/29/00	9/29/00	9/29/00	9/29/00	9/29/00	9/29/00	9/29/00	9/29/00	9/29/00	9/29/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00		
Collection Time	16:41	7:56	8:23	8:58	11:28	9:19	9:24	10:21	11:24		10:31	10:30	14:03	15:00	8:42	8:53	9:05	9:48			#239	#239
ECCS Field ID	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.05	0.027 JB	< 0.05	< 0.50	< 0.05	0.060 JB	0.31 JB	0.025 JB	0.022 JB			< 0.05	0.033 JB	0.22 JB	0.22 JB	0.16 JB	< 0.50	0.16 JB	0.14 JB	86%	128%
1,1-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	89%	103%
trans-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	90%	100%
1,1-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	118%	153%
cis-1,2-Dichloroethene	< 0.05	0.024 J	0.088	0.059	0.25 J	0.095	0.20	0.83	< 0.05	0.086			< 0.05	0.086	1.5	1.5	0.85	0.29 J	1.2	0.94	101%	95%
1,1,1-Trichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	113%	168%
1,2-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	128%	125%
Trichloroethene	< 0.05	< 0.05	0.027 J	0.046 J	4.2	1.2	2.4	14	0.045 J	1.1			0.020 J	0.57	5.4	7.8	6.9	8.2	4.4	6.8	104%	108%
Tetrachloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	103%	112%
Freon-113	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	117%	142%
Surrogate(ELCD)	88%	105%	104%	97%	95%	101%	114%	95%	105%	114%			109%	113%	98%	109%	82%	98%	107%	98%	132%	64%
Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	101%	99%
Toluene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	101%	102%
Ethyl Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	103%	104%
M&P Xylenes	< 0.05	< 0.05	< 0.05	< 0.05	< 0.50	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	104%	103%
o-Xylene	< 0.05	< 0.05	< 0.05	< 0.05	0.39 J	< 0.05	< 0.10	< 0.50	< 0.05	< 0.05			< 0.05	< 0.05	< 0.25	< 0.25	< 0.25	< 0.50	< 0.25	< 0.25	103%	97%
Surrogate(PID)	88%	102%	95%	94%	94%	90%	98%	102%	92%	96%			98%	100%	102%	98%	83%	106%	96%	95%	108%	83%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

* = Past hold time on seperate report page.

Signature Block

Michael Jenkins

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	125-D	125-H	125-L	125-S	Pdup 029	304-E	304-I	304-N	304-R	302-E	302-G	302-N	302-R	300-E	300-J	300-O	303-F	303-H	303-L	303-V		
Collection Date	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	9/30/00	MB	MSD
Collection Time	8:36	8:52	9:13	10:26		12:41	12:57	13:13	13:33	10:51	11:02	12:51	13:26	15:21	15:41	16:13	15:32	15:43	16:13	17:46	#266	#266
ECCS Field ID	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	0.029 JB	0.078 B	0.036 JB	< 0.05	< 0.05	< 0.05	0.021 JB	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	84%	89%
1,1-Dichloroethene	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	97%	97%
trans-1,2-Dichloroethene	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	99%	98%
1,1-Dichloroethane	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	126%	102%
cis-1,2-Dichloroethene	0.066	0.62	0.16	< 0.05	< 0.05	< 0.05	0.026 J	0.32	0.31	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	99%	101%
1,1,1-Trichloroethane	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	126%	128%
1,2-Dichloroethane	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	129%	129%
Trichloroethene	0.024 J	2.4	1.4	0.038 J	0.095	< 0.05	< 0.05	0.078	0.064	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.10	< 0.05	< 0.05	< 0.05	104%	105%
Tetrachloroethene	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.38	0.30	0.030 JB	0.025 JB	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	102%	104%
Freon-113	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	108%	108%
Surrogate(ELCD)	91%	92%	103%	108%	108%	79%	95%	107%	106%		102%	88%	91%	98%	102%	103%	104%	100%	108%	104%	116%	112%
Benzene	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	100%	102%
Toluene	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	100%	102%
Ethyl Benzene	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	101%	103%
M&P Xylenes	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	102%	104%
o-Xylene	< 0.05	< 0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.048 J	< 0.05	< 0.05	< 0.05	100%	102%
Surrogate(PID)	88%	90%	93%	96%	96%	80%	89%	93%	88%	86%	95%	93%	87%	91%	94%	102%	119%	118%	96%	99%	100%	100%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Fuskus

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	307-E	307-J	307-T	305-C	305-H	305-L	305-V	308-C	308-G	308-J	308-Q	Fdup 030	505-D	505-I	505-L	505-Q	301-E	301-H	301-M	301-U		
Collection Date	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	MS	MSD
Collection Time	8:24	8:44	9:36	8:11	8:33	9:04	10:33	10:37	10:53	11:00	11:50		13:31	14:00	14:11	15:00	16:25	18:39	13:57	15:25	#280	#280
ECCS Field ID	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	68%	69%
1,1-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	89%	89%
trans-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	92%	92%
1,1-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	113%	116%
cis-1,2-Dichloroethene	< 0.05	0.057	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.054	0.16	101%	100%
1,1,1-Trichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	107%	116%
1,2-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	121%	130%
Trichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.15	102%	103%
Tetrachloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.028 J	1.3	103%	104%
Freon-113	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	98%	106%
Surrogate(ELCD)	114%	101%	114%	112%	108%	111%	103%	114%	111%	113%	102%	99%	114%	107%	107%	108%	107%	104%	109%	110%	115%	123%
Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	100%	100%
Toluene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	101%	101%
Ethyl Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	103%	103%
M&P Xylenes	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	103%	103%
o-Xylene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	103%	103%
Surrogate(PID)	101%	98%	95%	101%	93%	100%	94%	98%	94%	92%	92%	92%	100%	95%	95%	98%	100%	101%	106%	99%	103%	103%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Fristoe

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	301-X	500-C	500-G	500-J	500-O	Fdup 031	420-I	420-L	420-Q	420-T	423-E	423-K	423-N	423-V	Fdup 032	701-T	701-W	410-G	410-K	410-S	MB	MSD
Collection Date	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/1/00	10/2/00	10/2/00	10/2/00	10/2/00	10/2/00	10/2/00	10/2/00	10/2/00	10/2/00	10/2/00	10/2/00	10/2/00	10/2/00	10/2/00	MB	MSD
Collection Time	15:51	16:00	16:15	16:25	16:56		8:25	8:40	9:25	9:40	8:10	8:40	9:06	9:52		14:02	14:21	12:56	13:14	13:57	#296	#296
ECCS Field ID	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	72%	71%
1,1-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	90%	89%
trans-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	93%	88%
1,1-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	122%	118%
cis-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.19	0.24	< 0.05	4.8	< 5.0	< 0.50	5.0	< 0.05	< 0.05	< 0.05	0.12	< 0.05	99%	99%
1,1,1-Trichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	128%	121%
1,2-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	131%	127%
Trichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.83	3.6	< 0.05	52	190	19	90	< 0.05	< 0.05	< 0.05	0.037 J	0.41	102%	102%
Tetrachloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.069	< 0.10	< 0.05	1.9 J	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	102%	101%
Freon-113	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	102%	100%
Surrogate(ELCD)	113%	113%	106%	113%	113%	104%	109%	109%	111%	114%	99%	DO	DO	95%	DO	96%	105%	110%	112%	112%	116%	115%
Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	99%	100%
Toluene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	99%	100%
Ethyl Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	102%	101%
M&P Xylenes	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	102%	102%
o-Xylene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05	< 2.5	< 5.0	< 0.50	< 5.0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	101%	101%
Surrogate(PID)	98%	98%	98%	98%	98%	93%	98%	98%	101%	96%	93%	DO	DO	103%	DO	94%	102%	94%	96%	100%	101%	101%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

D = Result from dilution.

Signature Block

Michael Zwickers

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	419-X	210-S	210-W	Fdup 034	417-H	417-K	417-M	417-S	418-G	418-O	418-R	418-T	418-Y	421-G	421-K	421-U	Fdup 035	422-F	133-E	133-L	MS	MSD
Collection Date	10/2/00	10/2/00	10/2/00	10/2/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00	10/3/00		
Collection Time	14:25	16:10	16:37		10:34	10:48	10:58	11:30	9:10	10:10	10:26	10:49	13:44	14:06	14:20	15:14		14:46	16:26	18:46	#317	#317
ECCS Field ID	321	322	323	324	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342		
Target Analyte																						
Vinyl Chloride	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	75%	78%
1,1-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	92%	92%
trans-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	97%	97%
1,1-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	119%	114%
cis-1,2-Dichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.14	< 0.05	0.030 J	0.022 J	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.67	4.2	101%	102%
1,1,1-Trichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	121%	119%
1,2-Dichloroethane	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	127%	127%
Trichloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	1.1	< 0.05	0.28	0.75	5.1	< 0.05	< 0.05	0.054	< 0.05	0.072	< 0.05	0.20	7.2	105%	104%
Tetrachloroethene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.027 J	0.19 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	106%	103%
Freon-113	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	102%	102%
Surrogate(ELCD)	117%	113%	116%	79%	90%	97%	105%	96%	103%	108%	98%	74%	102%	115%	103%	100%	114%	96%	103%	81%	120%	112%
Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	0.029 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	102%	102%
Toluene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	103%	103%
Ethyl Benzene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	105%	103%
M&P Xylenes	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	105%	104%
o-Xylene	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.25	105%	103%
Surrogate(PID)	101%	97%	98%	77%	93%	102%	99%	91%	96%	102%	102%	80%	97%	96%	98%	93%	101%	92%	100%	91%	104%	102%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Lenaghan

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	133-N	Fdup 036	422-K	422-P	422-T	422-X	Fdup 037	219-B	219-K	219-N	219-V	Fdup 038	132-D	132-J	132-Q	132-V			MS	MSD		MS	MSD
Collection Date	10/3/00	10/3/00	10/4/00	10/4/00	10/4/00	10/4/00	10/4/00	10/4/00	10/4/00	10/4/00	10/4/00	10/4/00	10/4/00	10/4/00	10/4/00	10/4/00							
Collection Time	18:57		7:58	8:19	8:42	9:12		7:36	8:36	8:56	10:00		10:24	10:42	12:26	13:01			#340	#340		#356	#356
ECCS Field ID	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358							
Target Analyte																							
Vinyl Chloride	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			78%	88%		71%	72%
1,1-Dichloroethene	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			90%	102%		82%	94%
trans-1,2-Dichloroethene	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			94%	100%		96%	98%
1,1-Dichloroethane	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			109%	128%		116%	116%
cis-1,2-Dichloroethene	1.8	1.8	0.041 J	0.24 J	< 0.10	< 0.25	0.24 J	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.59	0.11	< 0.05			101%	99%		103%	107%
1,1,1-Trichloroethane	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			111%	142%		113%	122%
1,2-Dichloroethane	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			116%	107%		120%	130%
Trichloroethene	19	19	0.052	3.5 J	1.8	< 0.25	3.7	< 0.05	0.20	0.057	< 0.05	0.15	< 0.05	0.040 J	2.8	< 0.05			105%	111%		103%	106%
Tetrachloroethene	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.040 J	< 0.05			103%	113%		103%	107%
Freon-113	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			107%	124%		99%	101%
Surrogate(ELCD)	93%	110%	98%	109%	123%	109%	98%	123%	114%	115%	119%	108%	112%	95%	108%	112%			111%	86%		114%	119%
Benzene	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			104%	104%		100%	104%
Toluene	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			102%	105%		102%	105%
Ethyl Benzene	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			105%	106%		101%	104%
M&P Xylenes	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			105%	106%		104%	107%
o-Xylene	< 0.50	< 0.50	< 0.05	< 0.25	< 0.10	< 0.25	< 0.25	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.10	< 0.05			104%	102%		102%	107%
Surrogate(PID)	100%	99%	94%	147%	98%	97%	93%	99%	98%	95%	94%	94%	98%	80%	98%	98%			98%	98%		101%	102%

J = Estimated

E = Exceeds calibration range

F = Result from PID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

D = Result from dilution.

Signature Block

Michael Lindsey

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	100-K	102-E	102-H	102-J	102-N	104-H	104-J	104-N	104-O	106-H	106-M	106-N	109-K	113-J	114-R	414-U	411-X	108-N	409-V	116-J	409-X	120-L	121-P
Collection Date	9/12/00	9/12/00	9/12/00	9/12/00	9/12/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/13/00	9/15/00	9/14/00	9/16/00	9/15/00	9/17/00	9/13/00	9/14/00	9/13/00	9/14/00	9/14/00	9/15/00
Collection Time	17:01	16:35	16:55	17:15	18:05	8:40	9:00	9:45	10:15	8:38	9:27	9:28	8:57	8:39	9:30	17:11	13:19	15:56	14:38	16:00	16:02	11:03	15:12
ECCS Field ID	S1	S2	S3	S4	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23	S24
Target Analyte																							
1,1-Dichloroethene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
trans-1,2-Dichloroethene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloroethane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,2-Dichloroethene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.33 J	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.48 J	< 0.50	< 0.50	< 0.50	0.41 J	< 0.50	< 0.50	< 0.50
1,1,1-Trichloroethane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichloroethane	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichloroethene	1.7	1.8	5.4	< 0.50	3.0	4.0	2.4	0.61	1.2	1.1	0.89	1.1	1.9	< 0.50	1.7	31 E	25 E	< 0.50	6.6	1.4	< 0.50	0.69	6.3
Tetrachloroethene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Freon-113	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Toluene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethyl Benzene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
M&P Xylenes	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
o-Xylene	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

J = Estimated

E = Exceeds calibration range

These sample are FID only.

2

Signature Block

Michael D Lineberry

ECCS, Inc.

20-Oct-00

VOC Report Form - Area 32/33 Crab Orchard National Wildlife Refuge

Sample ID	WW-001	WW-002
Collection Date	10/3/00	10/3/00
Collection Time	12:45	12:50
ECCS Field ID	325	326
Target Analyte		
Vinyl Chloride	< 0.001	< 0.001
1,1-Dichloroethene	< 0.001	< 0.001
trans-1,2-Dichloroethene	< 0.001	< 0.001
1,1-Dichloroethane	< 0.001	< 0.001
cis-1,2-Dichloroethene	< 0.001	0.006
1,1,1-Trichloroethane	< 0.001	< 0.001
1,2-Dichloroethane	< 0.001	< 0.001
Trichloroethene	0.008	0.15 E
Tetrachloroethene	< 0.001	< 0.001
Freon-113	< 0.001	0.002
Surrogate(ELCD)	131%	152%
Benzene	< 0.001	< 0.001
Toluene	< 0.001	0.002
Ethyl Benzene	< 0.001	0.006
M&P Xylenes	< 0.001	< 0.001
o-Xylene	< 0.001	0.003
Surrogate(PID)	108%	108%

J = Estimated

E = Exceeds calibration range

F = Result from FID Analysis

B = Analyte found in associated blank.

ND = Not detected.

DO = Diluted out.

21/22

Signature Block

Michael Lingham

ECCS, Inc.

20-Oct-00

Appendix G
Off-Site Laboratory
Soil VOC Analytical Reports

Sample Identification

SEVERN
TRENT
SERVICES

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720-6961

Tel: 330 497 9396
Fax: 330 497 0772
www.stl-inc.com

ANALYTICAL REPORT

PROJECT NO. 4781.06

CONWR

Lot #: A0I140267

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

September 22, 2000

5

CASE NARRATIVE

A0I140267

The following report contains the analytical results for four solid samples and one quality control sample submitted to STL North Canton by RMT from the CONWR site, project number 4781.06. The samples were received on September 14, 2000, according to documented sample acceptance procedures

Samples listed on the chain-of-custody but not included in this report will be reported under separate cover.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) which contain results between the MDL and the RL have been flagged with J. There is the possibility of false positive or misidentification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation will be performed only down to the standard reporting limit (SRL). The acceptance criteria for QC criteria may not be met at these quantitation levels.

Sample(s) which contain concentrations of target analyte(s) at a reportable level in the associated method blank(s) have been flagged with B. All target analytes in the method blank must be below the reporting limits (RL) or the associated sample(s) must be ND with the exception of Methylene chloride, Acetone, and 2-Butanone. These are common laboratory contaminants and may be present in concentrations up to five times the reporting limits.

The calibration check for instrument UX5 on August 7, 2000 failed recoveries for Acetone, 2-Butanone, and 2-Hexanone. These compounds have poor purging efficiency; therefore, the initial calibration was acceptable.

SAMPLE SUMMARY

A0I140267

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DKDJV	001	SB32/33-106-L-000913	09/13/00	09:13
DKDK2	002	SB32/33-104-F-000913	09/13/00	08:30
DKDLQ	003	SB32/33-101-I-000913	09/13/00	11:37
DKDLW	004	SB32/33-116-F-000913	09/13/00	15:30
DKDM2	005	TRIP BLANK-01	09/13/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

SEVERN
TRENT
SERVICES

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720-6961

Tel: 330 497 9396
Fax: 330 497 0772
www.stl-inc.com

ANALYTICAL REPORT

REVISED

REC'D RMT 9-25-00

PROJECT NO. 4781.06

CONWR

Lot #: A0I140263

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

September 22, 2000

9

CASE NARRATIVE

A0I140263

The following report contains the analytical results for one methanol extracted solid sample submitted to STL North Canton by RMT from the CONWR Site, project number 4781.06. The sample was received on September 14, 2000, according to documented sample acceptance procedures.

Samples listed on the chain-of-custody but not included in this report will be provided under separate cover.

STL utilizes USEPA approved methods in all analytical work. The sample presented in this report was analyzed for the parameter listed on the analytical methods summary page in accordance with the method indicated. Preliminary results were provided by facsimile transmission to Meredith Westover on September 15, 2000.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The sample was requested for qualitative conformation only. No QC has been provided.

SAMPLE SUMMARY

A0I140263

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DKDJ2	001	SB32/33-103-F-000912	09/12/00	11:06

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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ANALYTICAL REPORT

REC'D RMT 10-26-00

PROJECT NO. 4781.06

CONWR

Lot #: A0I290205

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

October 20, 2000

13

CASE NARRATIVE

A0I290205

The following report contains the analytical results for three soil samples and one quality control sample submitted to STL North Canton by RMT from the CONWR site, project number 4781.06. The samples were received on September 29, 2000, according to documented sample acceptance procedures

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) which contain results between the MDL and the RL have been flagged with J. There is the possibility of false positive or misidentification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation will be performed only down to the standard reporting limit (SRL). The acceptance criteria for QC criteria may not be met at these quantitation levels.

Sample(s) which contain concentrations of target analyte(s) at a reportable level in the associated method blank(s) have been flagged with B. All target analytes in the method blank must be below the reporting limits (RL) or the associated sample(s) must be ND with the exception of Methylene chloride, Acetone, and 2-Butanone. These are common laboratory contaminants and may be present in concentrations up to five times the reporting limits.

The calibration check for instrument UX3 on July 14, 2000 failed recoveries for Acetone and 2-Butanone. These compounds have poor purging efficiency; therefore, the initial calibration was acceptable.

SAMPLE SUMMARY

A0I290205

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DL9K1	001	SB32/33-128-O-000928	09/28/00	10:05
DL9KK	002	SB32/33-127-U-000928	09/28/00	14:48
DL9KL	003	SB32/33-115-R-000928	09/28/00	15:56
DL9KQ	004	TRIP BLANK	09/28/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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ANALYTICAL REPORT

REC'D RMT 9-28-00

PROJECT NO. 4781.06

CONWR

Lot #: A0I160164

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

September 27, 2000

17

CASE NARRATIVE

A0I160164

The following report contains the analytical results for five solid samples and one quality control sample submitted to STL North Canton by RMT from the CONWR site, project number 4781.06. The samples were received on September 16, 2000, according to documented sample acceptance procedures

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) which contain results between the MDL and the RL have been flagged with J. There is the possibility of false positive or misidentification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation will be performed only down to the standard reporting limit (SRL). The acceptance criteria for QC criteria may not be met at these quantitation levels.

Sample(s) which contain concentrations of target analyte(s) at a reportable level in the associated method blank(s) have been flagged with B. All target analytes in the method blank must be below the reporting limits (RL) or the associated sample(s) must be ND with the exception of Methylene chloride, Acetone, and 2-Butanone. These are common laboratory contaminants and may be present in concentrations up to five times the reporting limits.

The calibration check for instrument UX5 on August 7, 2000 failed recoveries for Acetone, 2-Butanone, and 2-Hexanone. These compounds have poor purging efficiency; therefore, the initial calibration was acceptable.

SAMPLE SUMMARY

A0I160164

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DKHHT	001	SB32/33-413-R-000915	09/15/00	09:1
DKHHW	002	SB32/33-119-I-000915	09/15/00	10:4
DKHHX	003	SB32/33-410-O-000915	09/15/00	12:5
DKHJ0	004	SB32/33-121-R-000915	09/15/00	15:3
DKHJ1	005	FDUP32/33-006-000915	09/15/00	
DKHJ2	006	TRIP BLANK	09/15/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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[DATE REC'D AT RMT NOT KNOWN]

ANALYTICAL REPORT

CONWR

Lot #: A0J020163

Eric Gredell

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P.O. Box 8923
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SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

October 19, 2000

CASE NARRATIVE

A0J020163

The following report contains the analytical results for three solid samples and one quality control sample submitted to STL North Canton by RMT from the CONWR site. The samples were received on October 2, 2000, according to documented sample acceptance procedures.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) that contained concentrations of target analyte(s) at a reportable level in the associated Method Blank(s) were flagged with "B". All target analytes in the Method Blank must be below the reporting limit (RL) or the associated sample(s) must be ND with the exception of common laboratory contaminants.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

The calibration check for instrument UX3 on July 14, 2000 failed recoveries for Acetone and 2-Butanone. These compounds have poor purging efficiency; therefore, the initial calibration was acceptable.

Samples SB32/33-129-K-000929, SB32/33-131-E-000929, and FDUP32/33-026-000929 were received in the laboratory for volatile analyses with less than half of their holding time remaining. The client was notified by telephone of this anomaly.

SAMPLE SUMMARY

A0J020163

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DLE6F	001	SB32/33-129-K-000929	09/29/00	08:5
DLE6G	002	SB32/33-131-E-000929	09/29/00	09:2
DLE6H	003	FDUP32/33-026-000929	09/29/00	
DLE6L	004	TRIP BLANK	09/29/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
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inv ok

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ANALYTICAL REPORT

PROJECT NO. 4781.06

CONWR

Lot #: A0J050130

Eric Gredell

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SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

October 20, 2000

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CASE NARRATIVE

A0J050130

The following report contains the analytical results for two solid samples and one quality control sample submitted to STL North Canton by RMT from the CONWR site, project number 4781.06. The samples were received on October 5, 2000, according to documented sample acceptance procedures.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) that contained concentrations of target analyte(s) at a reportable level in the associated Method Blank(s) were flagged with "B". All target analytes in the Method Blank must be below the reporting limit (RL) or the associated sample(s) must be ND with the exception of common laboratory contaminants.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

The calibration check for instrument UX5 failed recoveries for Acetone, 2-Butanone, and 2-Hexanone. These compounds have poor purging efficiency; therefore, the initial calibration was acceptable.

SAMPLE SUMMARY

A0J050130

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DLK39	001	SB32/33-422-P-001004	10/04/00	08:19
DLK3A	002	SB32/33-13~~3~~2-J-001004	10/04/00	10:42
DLK3C	003	TRIP BLANK	10/04/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
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ANALYTICAL REPORT

CONWR

Lot #: A0J040181

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SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

October 20, 2000

CASE NARRATIVE

A0J040181

The following report contains the analytical results for six solid samples and one quality control sample submitted to STL North Canton by RMT from the CONWR site. The samples were received on October 4, 2000, according to documented sample acceptance procedures.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) that contained concentrations of target analyte(s) at a reportable level in the associated Method Blank(s) were flagged with "B". All target analytes in the Method Blank must be below the reporting limit (RL) or the associated sample(s) must be ND with the exception of common laboratory contaminants.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

The calibration check for instrument UX5 failed recoveries for Acetone, 2-Butanone, and 2-Hexanone. These compounds have poor purging efficiency; therefore, the initial calibration was acceptable.

Sample SB32/33-418-O-001003 was preserved after the holding time had been exceeded by eleven minutes.

SAMPLE SUMMARY

A0J040181

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DLHH9	001	SB32/33-417-K-001003	10/03/00	10:46
DLHHL	002	SB32/33-417-M-001003	10/03/00	10:58
DLHHN	003	SB32/33-418-O-001003	10/03/00	10:10
DLHHT	004	SB32/33-421-K-001003	10/03/00	14:20
DLHKF	006	SB32/33-133-E-001003	10/03/00	16:26
DLHKH	007	SB32/33-133-L-001003	10/03/00	16:46
DLHKL	008	TRIP BLANK	10/03/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
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ANALYTICAL REPORT

REC'D RMT 11-3-00

CONWR
SDG #: 0J13156

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P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

October 31, 2000

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SAMPLE SUMMARY

A0J130156

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DM4D2	001	SB32/33-506-B-001012	10/12/00	13:41
DM4EC	002	SB32/33-506-G-001012	10/12/00	14:05
DM4EG	003	SB32/33-506-L-001012	10/12/00	14:27
DM4EH	004	SB32/33-506-N-001012	10/12/00	14:42
DM4EK	005	TRIP BLANK	10/12/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
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SAMPLE SUMMARY

A0J180255

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DNC5R	001	SB32/33-134-B-001017	10/17/00	08:41
DNC58	002	SB32/33-134-G-001017	10/17/00	09:10
DNC59	003	SB32/33-134-K-001017	10/17/00	09:25
DNC6A	004	SB32/33-134-N-001017	10/17/00	09:33
DNC6D	005	TRIP BLANK	10/17/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

SAMPLE SUMMARY

A0J180230

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DNCWW	001	SB32/33-306-E-001016	10/16/00	15:00
DNCW3	002	SB32/33-306-K-001016	10/16/00	15:22
DNCW5	003	SB32/33-306-P-001016	10/16/00	15:52
DNCXL	004	SB32/33-306-W-001016	10/16/00	16:46
DNCXN	005	TRIP BLANK	10/16/00	
DNCX2	006	FDUP32/33-039-001016	10/16/00	

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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ANALYTICAL REPORT

REC'D RMT 9-29-00

PROJECT NO. 4781.06

CONWR

Lot #: A0I190242

Eric Gredell

RMT
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Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

September 28, 2000

37

CASE NARRATIVE

A0119024?

The following report contains the analytical results for six solid samples and one quality control sample submitted to STL North Canton by RMT from the CONWR Site project number 4781.06. The samples were received on September 19, 2000, according to documented sample acceptance procedures

STL North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. A summary of QC data for these analyses is included at the rear of the report.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GENERAL CHEMISTRY

Some samples had elevated reporting limits due to matrix interferences or dilution.

GC/MS VOLATILES

Sample(s) that contained concentrations of target analyte(s) at a reportable level in the associated Method Blank(s) were flagged with "B". All target analytes in the Method Blank must be below the reporting limit (RL) or the associated sample(s) must be ND with the exception of common laboratory contaminants.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

SAMPLE SUMMARY

A0I190242

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DKLVQ	001	SB32/33-200-K-000918	09/18/00	09:4
DKLWA	002	SB32/33-407-S-000918	09/18/00	10:1
DKLWF	003	SB32/33-201-E-000918	09/18/00	10:4
DKLWJ	004	SB32/33-202-F-000918	09/18/00	14:1
DKLWM	005	SB32/33-403-O-000918	09/18/00	16:4
DKLWP	006	FDUP32/33-012-000918	09/18/00	
DKLWV	007	TRIP BLANK	09/18/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
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- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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ANALYTICAL REPORT

REC'D RMT 10-25-00

CONWR

Lot #: A0J030148

Eric Gredell

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Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

October 24, 2000

CASE NARRATIVE

A0J030148

The following report contains the analytical results for seven solid samples and one quality control sample submitted to STL North Canton by RMT from the CONWR site. The samples were received on October 3, 2000, according to documented sample acceptance procedures.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) that contained concentrations of target analyte(s) at a reportable level in the associated Method Blank(s) were flagged with "B". All target analytes in the Method Blank must be below the reporting limit (RL) or the associated sample(s) must be ND with the exception of common laboratory contaminants.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

The calibration check for instrument UX3 on July 14, 2000 failed recoveries for Acetone and 2-Butanone. These compounds have poor purging efficiency; therefore, the initial calibration was acceptable.

SAMPLE SUMMARY

A0J030148

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DLFEL	001	SB32/33-420-L-001002	10/02/00	08:40
DLFEX	002	SB32/33-420-Q-001002	10/02/00	09:25
DLFF8	003	SB32/33-423-K-001002	10/02/00	08:40
DLFFL	004	SB32/33-201-W-001002	10/02/00	14:21
DLFFR	005	SB32/33-419-S-001002	10/02/00	13:57
DLFFW	006	SB32/33-210-W-001002	10/02/00	16:37
DLFG1	007	FDUP32/33-033-001002	10/02/00	
DLFG6	008	TRIP BLANK	10/02/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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ANALYTICAL REPORT

CONWR

Lot #: A0I210215

Eric Gredell

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SEVERN TRENT LABORATORIES, INC.

[Did not receive any reports w/original sig.; only rec'd copies]

Kenneth J. Kuzior
Project Manager

October 3, 2000

45

CASE NARRATIVE
A0I210215

The following report contains the analytical results for four soil samples and one quality control sample submitted to STL North Canton by RMT from the CONWR site. The samples were received on September 21, 2000, according to documented sample acceptance procedures

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) which contain results between the MDL and the RL have been flagged with J. There is the possibility of false positive or misidentification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation will be performed only down to the standard reporting limit (SRL). The acceptance criteria for QC criteria may not be met at these quantitation levels.

Sample(s) which contain concentrations of target analyte(s) at a reportable level in the associated method blank(s) have been flagged with B. All target analytes in the method blank must be below the reporting limits (RL) or the associated sample(s) must be ND with the exception of Methylene chloride, Acetone, and 2-Butanone. These are common laboratory contaminants and may be present in concentrations up to five times the reporting limits.

Sample SB32/33-212-J-000920 had elevated reporting limits due to TICs.

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SAMPLE SUMMARY

A0I210215

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DKRFH	001	SB32/33-212-J-000920	09/20/00	10:20
DKRFQ	002	SB32/33-504-B-000920	09/20/00	09:48
DKRFV	003	SB32/33-503-D-000920	09/20/00	12:36
DKRFX	004	SB32/33-211-J-000920	09/20/00	14:20
DKRG1	005	TRIP BLANK	09/20/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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inv ok

SEVERN TRENT SERVICES

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ANALYTICAL REPORT

REC'D RMT 10-30-00

PROJECT NO. 4781.06

CONWR

Lot #: A0I300124

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

October 26, 2000

STL North Canton is a part of Severn Trent Laboratories, Inc.

CASE NARRATIVE
A0I300124

The following report contains the analytical results for one soil sample submitted to STL North Canton by RMT from the CONWR site, project number 4781.06. The sample was received on September 29, 2000, according to documented sample acceptance procedures

STL utilizes USEPA approved methods in all analytical work. The sample presented in this report was analyzed for the parameter listed on the analytical methods summary page in accordance with the method indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) which contain results between the MDL and the RL have been flagged with J. There is the possibility of false positive or misidentification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation will be performed only down to the standard reporting limit (SRL). The acceptance criteria for QC criteria may not be met at these quantitation levels.

Sample(s) which contain concentrations of target analyte(s) at a reportable level in the associated method blank(s) have been flagged with B. All target analytes in the method blank must be below the reporting limits (RL) or the associated sample(s) must be ND with the exception of Methylene chloride, Acetone, and 2-Butanone. These are common laboratory contaminants and may be present in concentrations up to five times the reporting limits.

The sample(s) had elevated reporting limits due to matrix interferences, TICs, or dilution.

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SAMPLE SUMMARY

A0I300124

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DLCNV	001	SB32/33-217-T	09/28/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Volatile Organics Data Sheets

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I140267 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.52 / g Date Received: 09/14/00
Work Order: DKDLQ102 Date Extracted:09/15/00
Dilution factor: 0.69 Date Analyzed: 09/20/00
Moisture %:14

QC Batch: 0264225

Client Sample Id: SB32/33-101-I-000913

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	400	U
74-83-9	Bromomethane	400	U
75-01-4	Vinyl chloride	400	U
75-00-3	Chloroethane	400	U
75-09-2	Methylene chloride	200	U
67-64-1	**Acetone**	**700**	**J B**
75-15-0	Carbon disulfide	200	U
75-35-4	1,1-Dichloroethene	200	U
75-34-3	1,1-Dichloroethane	200	U
540-59-0	1,2-Dichloroethene (total)	200	U
67-66-3	Chloroform	200	U
107-06-2	1,2-Dichloroethane	200	U
78-93-3	2-Butanone	800	U
71-55-6	1,1,1-Trichloroethane	200	U
56-23-5	Carbon tetrachloride	200	U
75-27-4	Bromodichloromethane	200	U
78-87-5	1,2-Dichloropropane	200	U
10061-01-5	cis-1,3-Dichloropropene	200	U
79-01-6	Trichloroethene	200	U
124-48-1	Dibromochloromethane	200	U
79-00-5	1,1,2-Trichloroethane	200	U
71-43-2	Benzene	200	U
10061-02-6	trans-1,3-Dichloropropene	200	U
75-25-2	Bromoform	200	U
108-10-1	4-Methyl-2-pentanone	800	U
591-78-6	2-Hexanone	800	U
127-18-4	Tetrachloroethene	200	U
79-34-5	1,1,2,2-Tetrachloroethane	200	U

FORM I

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I140267 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.52 / g Date Received: 09/14/00
Work Order: DKDLQ102 Date Extracted:09/15/00
Dilution factor: 0.69 Date Analyzed: 09/20/00
Moisture %:14

QC Batch: 0264225

Client Sample Id: SB32/33-101-I-000913

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	200	U
108-90-7	Chlorobenzene	200	U
100-41-4	Ethylbenzene	200	U
100-42-5	Styrene	200	U
1330-20-7	Xylenes (total)	200	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I140267 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.52 / g Date Received: 09/14/00
Work Order: DKDLQ102 Date Extracted: 09/15/00
Dilution factor: 0.69 Date Analyzed: 09/20/00
Moisture %: 14

QC Batch: 0264225

Client Sample Id: SB32/33-101-I-000913

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	Unknown	1.8121	210	J

BMT

Client Sample ID: SB32/33-103-F-000912

GC/MS Volatiles

Lot-Sample #...: A0I140263-001 Work Order #...: DKDJ2101 Matrix.....: SO
Date Sampled...: 09/12/00 11:06 Date Received..: 09/14/00
Prep Date.....: 09/14/00 Analysis Date..: 09/14/00
Prep Batch #...: 0258557
Dilution Factor: 1
% Moisture.....: Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	500	ug/kg
Bromomethane	ND	500	ug/kg
Vinyl chloride	ND	500	ug/kg
Chloroethane	ND	500	ug/kg
Methylene chloride	ND	250	ug/kg
Acetone	240 J	1000	ug/kg
Carbon disulfide	ND	250	ug/kg
1,1-Dichloroethene	ND	250	ug/kg
1,1-Dichloroethane	ND	250	ug/kg
1,2-Dichloroethene (total)	100 J	250	ug/kg
Chloroform	26 J	250	ug/kg
1,2-Dichloroethane	ND	250	ug/kg
2-Butanone	ND	1000	ug/kg
1,1,1-Trichloroethane	ND	250	ug/kg
Carbon tetrachloride	ND	250	ug/kg
Bromodichloromethane	ND	250	ug/kg
1,2-Dichloropropane	ND	250	ug/kg
cis-1,3-Dichloropropene	ND	250	ug/kg
Trichloroethene	370	250	ug/kg
Dibromochloromethane	ND	250	ug/kg
1,1,2-Trichloroethane	ND	250	ug/kg
Benzene	ND	250	ug/kg
trans-1,3-Dichloropropene	ND	250	ug/kg
Bromoform	ND	250	ug/kg
4-Methyl-2-pentanone	ND	1000	ug/kg
2-Hexanone	ND	1000	ug/kg
Tetrachloroethene	ND	250	ug/kg
1,1,2,2-Tetrachloroethane	ND	250	ug/kg
Toluene	ND	250	ug/kg
Chlorobenzene	ND	250	ug/kg
Ethylbenzene	ND	250	ug/kg
Styrene	ND	250	ug/kg
Xylenes (total)	ND	250	ug/kg

NOTE(S):

J Estimated result. Result is less than RL.

Results and reporting limits have been adjusted for dry weight.

RMT

SB32/33-103-F-000912

GC/MS Volatiles

Lot-Sample #: A0I140263-001 **Work Order #:** DKDJ2101 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Nonane	111-84-2	4800 NJ	M	7.8129	ug/kg
Freon 113	76-13-1	3200	Q	2.606	ug/kg

NOTE(S):

Q: Result was quantitated against the response factor of a calibration standard.

M: Result was measured against nearest internal standard assuming a response factor of 1.

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I140267 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.44 / g Date Received: 09/14/00
Work Order: DKDK2102 Date Extracted: 09/15/00
Dilution factor: 2.31 Date Analyzed: 09/20/00
Moisture %: 18

QC Batch: 0264225

Client Sample Id: SB32/33-104-F-000913

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	1400	U
74-83-9	Bromomethane	1400	U
75-01-4	Vinyl chloride	1400	U
75-00-3	Chloroethane	1400	U
75-09-2	Methylene chloride	700	U
67-64-1	Acetone	960	J B
75-15-0	Carbon disulfide	700	U
75-35-4	1,1-Dichloroethene	700	U
75-34-3	1,1-Dichloroethane	700	U
540-59-0	1,2-Dichloroethene (total)	840	
67-66-3	Chloroform	700	U
107-06-2	1,2-Dichloroethane	700	U
78-93-3	2-Butanone	2800	U
71-55-6	1,1,1-Trichloroethane	700	U
56-23-5	Carbon tetrachloride	700	U
75-27-4	Bromodichloromethane	700	U
78-87-5	1,2-Dichloropropane	700	U
10061-01-5	cis-1,3-Dichloropropene	700	U
79-01-6	Trichloroethene	20000	
124-48-1	Dibromochloromethane	700	U
79-00-5	1,1,2-Trichloroethane	700	U
71-43-2	Benzene	700	U
10061-02-6	trans-1,3-Dichloropropene	700	U
75-25-2	Bromoform	700	U
108-10-1	4-Methyl-2-pentanone	2800	U
591-78-6	2-Hexanone	2800	U
127-18-4	Tetrachloroethene	700	U
79-34-5	1,1,2,2-Tetrachloroethane	700	U

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RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I140267 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.44 / g Date Received: 09/14/00
Work Order: DKDK2102 Date Extracted:09/15/00
Dilution factor: 2.31 Date Analyzed: 09/20/00
Moisture %:18

QC Batch: 0264225

Client Sample Id: SB32/33-104-F-000913

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	700	U
108-90-7	Chlorobenzene	700	U
100-41-4	Ethylbenzene	700	U
100-42-5	Styrene	700	U
1330-20-7	Xylenes (total)	700	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I140267 002

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.44 / g Date Received: 09/14/00

Work Order: DKDK2102 Date Extracted:09/15/00

Dilution factor: 2.31 Date Analyzed: 09/20/00

Moisture %:18

QC Batch: 0264225

Client Sample Id: SB32/33-104-F-000913

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I140267 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.87 / g Date Received: 09/14/00
Work Order: DKDJV102 Date Extracted:09/15/00
Dilution factor: 7.21 Date Analyzed: 09/20/00
Moisture %:15

QC Batch: 0264225

Client Sample Id: SB32/33-106-L-000913

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	4300	U
74-83-9	Bromomethane	4300	U
75-01-4	Vinyl chloride	4300	U
75-00-3	Chloroethane	4300	U
75-09-2	Methylene chloride	2100	U
67-64-1	**Acetone**	**1600**	**J B**
75-15-0	Carbon disulfide	2100	U
75-35-4	1,1-Dichloroethene	2100	U
75-34-3	1,1-Dichloroethane	2100	U
540-59-0	**1,2-Dichloroethene (total)**	**1200**	**J**
67-66-3	Chloroform	2100	U
107-06-2	1,2-Dichloroethane	2100	U
78-93-3	2-Butanone	8500	U
71-55-6	1,1,1-Trichloroethane	2100	U
56-23-5	Carbon tetrachloride	2100	U
75-27-4	Bromodichloromethane	2100	U
78-87-5	1,2-Dichloropropane	2100	U
10061-01-5	cis-1,3-Dichloropropene	2100	U
79-01-6	**Trichloroethene**	**50000**	
124-48-1	Dibromochloromethane	2100	U
79-00-5	1,1,2-Trichloroethane	2100	U
71-43-2	Benzene	2100	U
10061-02-6	trans-1,3-Dichloropropene	2100	U
75-25-2	Bromoform	2100	U
108-10-1	4-Methyl-2-pentanone	8500	U
591-78-6	2-Hexanone	8500	U
127-18-4	Tetrachloroethene	2100	U
79-34-5	1,1,2,2-Tetrachloroethane	2100	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I140267 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.87 / g Date Received: 09/14/00
Work Order: DKDJV102 Date Extracted:09/15/00
Dilution factor: 7.21 Date Analyzed: 09/20/00
Moisture %:15

QC Batch: 0264225

Client Sample Id: SB32/33-106-L-000913

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	2100	U
108-90-7	Chlorobenzene	2100	U
100-41-4	Ethylbenzene	2100	U
100-42-5	Styrene	2100	U
1330-20-7	Xylenes (total)	2100	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I140267 001

Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.87 / g Date Received: 09/14/00

Work Order: DKDJV102 Date Extracted: 09/15/00

Dilution factor: 7.21 Date Analyzed: 09/20/00

Moisture %: 15

QC Batch: 0264225

Client Sample Id: SB32/33-106-L-000913

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

RMT

Client Sample ID: SB32/33-115-R-000928

GC/MS Volatiles

Lot-Sample #...: A0I290205-003 Work Order #...: DL9KL102 Matrix.....: SO
Date Sampled...: 09/28/00 15:56 Date Received..: 09/29/00
Prep Date.....: 09/29/00 Analysis Date..: 10/03/00
Prep Batch #...: 0277571
Dilution Factor: 0.76
% Moisture.....: 14 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	440	ug/kg
Bromomethane	ND	440	ug/kg
Vinyl chloride	ND	440	ug/kg
Chloroethane	ND	440	ug/kg
Methylene chloride	ND	220	ug/kg
Acetone	**1000 B**	**880**	**ug/kg**
Carbon disulfide	ND	220	ug/kg
1,1-Dichloroethene	ND	220	ug/kg
1,1-Dichloroethane	ND	220	ug/kg
1,2-Dichloroethene (total)	**170 J**	**220**	**ug/kg**
Chloroform	ND	220	ug/kg
1,2-Dichloroethane	ND	220	ug/kg
2-Butanone	ND	880	ug/kg
1,1,1-Trichloroethane	ND	220	ug/kg
Carbon tetrachloride	ND	220	ug/kg
Bromodichloromethane	ND	220	ug/kg
1,2-Dichloropropane	ND	220	ug/kg
cis-1,3-Dichloropropene	ND	220	ug/kg
Trichloroethene	**7200**	**220**	**ug/kg**
Dibromochloromethane	ND	220	ug/kg
1,1,2-Trichloroethane	ND	220	ug/kg
Benzene	ND	220	ug/kg
trans-1,3-Dichloropropene	ND	220	ug/kg
Bromoform	ND	220	ug/kg
4-Methyl-2-pentanone	ND	880	ug/kg
2-Hexanone	ND	880	ug/kg
Tetrachloroethene	ND	220	ug/kg
1,1,2,2-Tetrachloroethane	ND	220	ug/kg
Toluene	ND	220	ug/kg
Chlorobenzene	ND	220	ug/kg
Ethylbenzene	ND	220	ug/kg
Styrene	ND	220	ug/kg
Xylenes (total)	ND	220	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	71	(59 - 138)
1,2-Dichloroethane-d4	75	(61 - 130)
Toluene-d8	79	(60 - 143)
4-Bromofluorobenzene	76	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-115-R-000928

GC/MS Volatiles

Lot-Sample #...: A0I290205-003 **Work Order #...:** DL9KL102 **Matrix.....:** SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated result. Result is less than RL.

RMT

SB32/33-115-R-000928

GC/MS Volatiles

Lot-Sample #: A0I290205-003 **Work Order #:** DL9KL102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I140267 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.13 / g Date Received: 09/14/00
Work Order: DKDLW102 Date Extracted: 09/15/00
Dilution factor: 1.18 Date Analyzed: 09/20/00
Moisture %: 18

QC Batch: 0264225

Client Sample Id: SB32/33-116-F-000913

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	720	U
74-83-9	Bromomethane	720	U
75-01-4	**Vinyl chloride**	**400**	**J**
75-00-3	Chloroethane	720	U
75-09-2	Methylene chloride	360	U
67-64-1	**Acetone**	**730**	**J B**
75-15-0	Carbon disulfide	360	U
75-35-4	1,1-Dichloroethene	360	U
75-34-3	1,1-Dichloroethane	360	U
540-59-0	**1,2-Dichloroethene (total)**	**3700**	
67-66-3	Chloroform	360	U
107-06-2	1,2-Dichloroethane	360	U
78-93-3	2-Butanone	1400	U
71-55-6	1,1,1-Trichloroethane	360	U
56-23-5	Carbon tetrachloride	360	U
75-27-4	Bromodichloromethane	360	U
78-87-5	1,2-Dichloropropane	360	U
10061-01-5	cis-1,3-Dichloropropene	360	U
79-01-6	**Trichloroethene**	**10000**	
124-48-1	Dibromochloromethane	360	U
79-00-5	1,1,2-Trichloroethane	360	U
71-43-2	Benzene	360	U
10061-02-6	trans-1,3-Dichloropropene	360	U
75-25-2	Bromoform	360	U
108-10-1	4-Methyl-2-pentanone	1400	U
591-78-6	2-Hexanone	1400	U
127-18-4	**Tetrachloroethene**	**190**	**J**
79-34-5	1,1,2,2-Tetrachloroethane	360	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I140267 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.13 / g Date Received: 09/14/00
Work Order: DKDLW102 Date Extracted: 09/15/00
Dilution factor: 1.18 Date Analyzed: 09/20/00
Moisture %: 18

QC Batch: 0264225

Client Sample Id: SB32/33-116-F-000913

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	360	U
108-90-7	Chlorobenzene	360	U
100-41-4	Ethylbenzene	360	U
100-42-5	Styrene	360	U
1330-20-7	Xylenes (total)	360	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I140267 004

Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.13 / g Date Received: 09/14/00

Work Order: DKDLW102 Date Extracted: 09/15/00

Dilution factor: 1.18 Date Analyzed: 09/20/00

Moisture %: 18

QC Batch: 0264225

Client Sample Id: SB32/33-116-F-000913

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

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Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I160164 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.36 / g Date Received: 09/16/00
Work Order: DKHHW102 Date Extracted: 09/16/00
Dilution factor: 0.7 Date Analyzed: 09/21/00
Moisture %: 16

QC Batch: 0266391

Client Sample Id: SB32/33-119-I-000915

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	420	U
74-83-9	Bromomethane	420	U
75-01-4	Vinyl chloride	420	U
75-00-3	Chloroethane	420	U
75-09-2	Methylene chloride	210	U
67-64-1	Acetone	600	J B
75-15-0	Carbon disulfide	210	U
75-35-4	1,1-Dichloroethene	210	U
75-34-3	1,1-Dichloroethane	210	U
540-59-0	1,2-Dichloroethene (total)	210	U
67-66-3	Chloroform	210	U
107-06-2	1,2-Dichloroethane	210	U
78-93-3	2-Butanone	830	U
71-55-6	1,1,1-Trichloroethane	210	U
56-23-5	Carbon tetrachloride	210	U
75-27-4	Bromodichloromethane	210	U
78-87-5	1,2-Dichloropropane	210	U
10061-01-5	cis-1,3-Dichloropropene	210	U
79-01-6	Trichloroethene	210	U
124-48-1	Dibromochloromethane	210	U
79-00-5	1,1,2-Trichloroethane	210	U
71-43-2	Benzene	210	U
10061-02-6	trans-1,3-Dichloropropene	210	U
75-25-2	Bromoform	210	U
108-10-1	4-Methyl-2-pentanone	830	U
591-78-6	2-Hexanone	830	U
127-18-4	Tetrachloroethene	210	U
79-34-5	1,1,2,2-Tetrachloroethane	210	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I160164 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.36 / g Date Received: 09/16/00
Work Order: DKHHW102 Date Extracted:09/16/00
Dilution factor: 0.7 Date Analyzed: 09/21/00
Moisture %:16

QC Batch: 0266391

Client Sample Id: SB32/33-119-I-000915

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	210	U
108-90-7	Chlorobenzene	210	U
100-41-4	Ethylbenzene	210	U
100-42-5	Styrene	210	U
1330-20-7	Xylenes (total)	210	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I160164 002

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.36 / g Date Received: 09/16/00

Work Order: DKHHW102 Date Extracted:09/16/00

Dilution factor: 0.7 Date Analyzed: 09/21/00

Moisture %:16

QC Batch: 0266391

Client Sample Id: SB32/33-119-I-000915

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

74

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I160164 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.76 / g Date Received: 09/16/00
Work Order: DKHJ0102 Date Extracted: 09/16/00
Dilution factor: 0.73 Date Analyzed: 09/21/00
Moisture %: 16

QC Batch: 0266391

Client Sample Id: SB32/33-121-R-000915

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	430	U
74-83-9	Bromomethane	430	U
75-01-4	Vinyl chloride	430	U
75-00-3	Chloroethane	430	U
75-09-2	Methylene chloride	220	U
67-64-1	**Acetone**	**540**	**J B**
75-15-0	Carbon disulfide	220	U
75-35-4	1,1-Dichloroethene	220	U
75-34-3	1,1-Dichloroethane	220	U
540-59-0	**1,2-Dichloroethene (total)**	**150**	**J**
67-66-3	Chloroform	220	U
107-06-2	1,2-Dichloroethane	220	U
78-93-3	2-Butanone	870	U
71-55-6	1,1,1-Trichloroethane	220	U
56-23-5	Carbon tetrachloride	220	U
75-27-4	Bromodichloromethane	220	U
78-87-5	1,2-Dichloropropane	220	U
10061-01-5	cis-1,3-Dichloropropene	220	U
79-01-6	**Trichloroethene**	**4300**	
124-48-1	Dibromochloromethane	220	U
79-00-5	1,1,2-Trichloroethane	220	U
71-43-2	Benzene	220	U
10061-02-6	trans-1,3-Dichloropropene	220	U
75-25-2	Bromoform	220	U
108-10-1	4-Methyl-2-pentanone	870	U
591-78-6	2-Hexanone	870	U
127-18-4	Tetrachloroethene	220	U
79-34-5	1,1,2,2-Tetrachloroethane	220	U

FORM I

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I160164 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.76 / g Date Received: 09/16/00
Work Order: DKHJ0102 Date Extracted: 09/16/00
Dilution factor: 0.73 Date Analyzed: 09/21/00
Moisture %: 16

QC Batch: 0266391

Client Sample Id: SB32/33-121-R-000915

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	220	U
108-90-7	Chlorobenzene	220	U
100-41-4	Ethylbenzene	220	U
100-42-5	Styrene	220	U
1330-20-7	Xylenes (total)	220	U

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FORM I

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I160164 004

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.76 / g Date Received: 09/16/00

Work Order: DKHJ0102 Date Extracted:09/16/00

Dilution factor: 0.73 Date Analyzed: 09/21/00

Moisture %:16

QC Batch: 0266391

Client Sample Id: SB32/33-121-R-000915

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

RMT

Client Sample ID: SB32/33-127-U-000928

GC/MS Volatiles

Lot-Sample #...: A0I290205-002 Work Order #...: DL9KK102 Matrix.....: SO
Date Sampled...: 09/28/00 14:48 Date Received..: 09/29/00
Prep Date.....: 09/29/00 Analysis Date..: 10/03/00
Prep Batch #...: 0277571
Dilution Factor: 0.71
% Moisture.....: 18 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	430	ug/kg
Bromomethane	ND	430	ug/kg
Vinyl chloride	ND	430	ug/kg
Chloroethane	ND	430	ug/kg
Methylene chloride	ND	220	ug/kg
Acetone	960 B	860	ug/kg
Carbon disulfide	ND	220	ug/kg
1,1-Dichloroethene	ND	220	ug/kg
1,1-Dichloroethane	ND	220	ug/kg
1,2-Dichloroethene (total)	ND	220	ug/kg
Chloroform	ND	220	ug/kg
1,2-Dichloroethane	ND	220	ug/kg
2-Butanone	ND	860	ug/kg
1,1,1-Trichloroethane	ND	220	ug/kg
Carbon tetrachloride	ND	220	ug/kg
Bromodichloromethane	ND	220	ug/kg
1,2-Dichloropropane	ND	220	ug/kg
cis-1,3-Dichloropropene	ND	220	ug/kg
Trichloroethene	ND	220	ug/kg
Dibromochloromethane	ND	220	ug/kg
1,1,2-Trichloroethane	ND	220	ug/kg
Benzene	ND	220	ug/kg
trans-1,3-Dichloropropene	ND	220	ug/kg
Bromoform	ND	220	ug/kg
4-Methyl-2-pentanone	ND	860	ug/kg
2-Hexanone	ND	860	ug/kg
Tetrachloroethene	ND	220	ug/kg
1,1,2,2-Tetrachloroethane	ND	220	ug/kg
Toluene	ND	220	ug/kg
Chlorobenzene	ND	220	ug/kg
Ethylbenzene	ND	220	ug/kg
Styrene	ND	220	ug/kg
Xylenes (total)	ND	220	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	79	(59 - 138)
1,2-Dichloroethane-d4	77	(61 - 130)
Toluene-d8	81	(60 - 143)
4-Bromofluorobenzene	81	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-127-U-000928

GC/MS Volatiles

Lot-Sample #...: A0I290205-002 Work Order #...: DL9KK102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-127-U-000928

GC/MS Volatiles

Lot-Sample #: A0I290205-002 **Work Order #:** DL9KK102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: SB32/33-128-O-000928

GC/MS Volatiles

Lot-Sample #...: A0I290205-001 **Work Order #...:** DL9K1102 **Matrix.....:** SO
Date Sampled...: 09/28/00 10:05 **Date Received..:** 09/29/00
Prep Date.....: 09/29/00 **Analysis Date..:** 10/03/00
Prep Batch #...: 0277571
Dilution Factor: 6.68
% Moisture.....: 13 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	3900	ug/kg
Bromomethane	ND	3900	ug/kg
Vinyl chloride	ND	3900	ug/kg
Chloroethane	ND	3900	ug/kg
Methylene chloride	ND	1900	ug/kg
Acetone	**3300 J,B**	**7700**	**ug/kg**
Carbon disulfide	ND	1900	ug/kg
1,1-Dichloroethene	ND	1900	ug/kg
1,1-Dichloroethane	ND	1900	ug/kg
1,2-Dichloroethene (total)	**4900**	**1900**	**ug/kg**
Chloroform	ND	1900	ug/kg
1,2-Dichloroethane	ND	1900	ug/kg
2-Butanone	ND	7700	ug/kg
1,1,1-Trichloroethane	ND	1900	ug/kg
Carbon tetrachloride	ND	1900	ug/kg
Bromodichloromethane	ND	1900	ug/kg
1,2-Dichloropropane	ND	1900	ug/kg
cis-1,3-Dichloropropene	ND	1900	ug/kg
Trichloroethene	**29000**	**1900**	**ug/kg**
Dibromochloromethane	ND	1900	ug/kg
1,1,2-Trichloroethane	ND	1900	ug/kg
Benzene	ND	1900	ug/kg
trans-1,3-Dichloropropene	ND	1900	ug/kg
Bromoform	ND	1900	ug/kg
4-Methyl-2-pentanone	ND	7700	ug/kg
2-Hexanone	ND	7700	ug/kg
Tetrachloroethene	ND	1900	ug/kg
1,1,2,2-Tetrachloroethane	ND	1900	ug/kg
Toluene	ND	1900	ug/kg
Chlorobenzene	ND	1900	ug/kg
Ethylbenzene	ND	1900	ug/kg
Styrene	ND	1900	ug/kg
Xylenes (total)	ND	1900	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	78 DIL	(59 - 138)
1,2-Dichloroethane-d4	76 DIL	(61 - 130)
Toluene-d8	79 DIL	(60 - 143)
4-Bromofluorobenzene	77 DIL	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-128-O-000928

GC/MS Volatiles

Lot-Sample #...: A0I290205-001 Work Order #...: DL9K1102 Matrix.....: SO

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-128-O-000928

GC/MS Volatiles

Lot-Sample #: A0I290205-001 **Work Order #:** DL9K1102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

EMT

Client Sample ID: SB32/33-129-K-000929

GC/MS Volatiles

Lot-Sample #...: A0J020163-001 Work Order #...: DLE6F102 Matrix.....: SO
Date Sampled...: 09/29/00 08:58 Date Received..: 10/02/00
Prep Date.....: 10/02/00 Analysis Date..: 10/05/00
Prep Batch #...: 0280214
Dilution Factor: 0.71
% Moisture.....: 23 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	460	ug/kg
Bromomethane	ND	460	ug/kg
Vinyl chloride	ND	460	ug/kg
Chloroethane	ND	460	ug/kg
Methylene chloride	ND	230	ug/kg
Acetone	750 J,B	920	ug/kg
Carbon disulfide	ND	230	ug/kg
1,1-Dichloroethene	ND	230	ug/kg
1,1-Dichloroethane	ND	230	ug/kg
1,2-Dichloroethene (total)	49 J	230	ug/kg
Chloroform	ND	230	ug/kg
1,2-Dichloroethane	ND	230	ug/kg
2-Butanone	ND	920	ug/kg
1,1,1-Trichloroethane	ND	230	ug/kg
Carbon tetrachloride	ND	230	ug/kg
Bromodichloromethane	ND	230	ug/kg
1,2-Dichloropropane	ND	230	ug/kg
cis-1,3-Dichloropropene	ND	230	ug/kg
Trichloroethene	ND	230	ug/kg
Dibromochloromethane	ND	230	ug/kg
1,1,2-Trichloroethane	ND	230	ug/kg
Benzene	ND	230	ug/kg
trans-1,3-Dichloropropene	ND	230	ug/kg
Bromoform	ND	230	ug/kg
4-Methyl-2-pentanone	ND	920	ug/kg
2-Hexanone	ND	920	ug/kg
Tetrachloroethene	ND	230	ug/kg
1,1,2,2-Tetrachloroethane	ND	230	ug/kg
Toluene	ND	230	ug/kg
Chlorobenzene	ND	230	ug/kg
Ethylbenzene	ND	230	ug/kg
Styrene	ND	230	ug/kg
Xylenes (total)	ND	230	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	80	(59 - 138)
1,2-Dichloroethane-d4	79	(61 - 130)
Toluene-d8	80	(60 - 143)
4-Bromofluorobenzene	80	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-129-K-000929

GC/MS Volatiles

Lot-Sample #...: A0J020163-001 Work Order #...: DLE6F102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

EMT

SB32/33-129-K-000929

GC/MS Volatiles

Lot-Sample #: A0J020163-001 **Work Order #:** DLE6F102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
1,2,4-Trichlorobenzene		740	Q	11.786	ug/kg

NOTE(S):

Q: Result was quantitated against the response factor of a calibration standard.

RMT

Client Sample ID: SB32/33-131-E-000929

GC/MS Volatiles

Lot-Sample #...: A0J020163-002 **Work Order #...:** DLE6G102 **Matrix.....:** SO
Date Sampled...: 09/29/00 09:24 **Date Received..:** 10/02/00
Prep Date.....: 10/02/00 **Analysis Date..:** 10/05/00
Prep Batch #...: 0280214
Dilution Factor: 0.7
% Moisture.....: 17 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	420	ug/kg
Bromomethane	ND	420	ug/kg
Vinyl chloride	ND	420	ug/kg
Chloroethane	ND	420	ug/kg
Methylene chloride	ND	210	ug/kg
Acetone	**860 B**	**840**	**ug/kg**
Carbon disulfide	ND	210	ug/kg
1,1-Dichloroethene	ND	210	ug/kg
1,1-Dichloroethane	ND	210	ug/kg
1,2-Dichloroethene (total)	**180 J**	**210**	**ug/kg**
Chloroform	ND	210	ug/kg
1,2-Dichloroethane	ND	210	ug/kg
2-Butanone	ND	840	ug/kg
1,1,1-Trichloroethane	ND	210	ug/kg
Carbon tetrachloride	ND	210	ug/kg
Bromodichloromethane	ND	210	ug/kg
1,2-Dichloropropane	ND	210	ug/kg
cis-1,3-Dichloropropene	ND	210	ug/kg
Trichloroethene	**2300**	**210**	**ug/kg**
Dibromochloromethane	ND	210	ug/kg
1,1,2-Trichloroethane	ND	210	ug/kg
Benzene	ND	210	ug/kg
trans-1,3-Dichloropropene	ND	210	ug/kg
Bromoform	ND	210	ug/kg
4-Methyl-2-pentanone	ND	840	ug/kg
2-Hexanone	ND	840	ug/kg
Tetrachloroethene	ND	210	ug/kg
1,1,2,2-Tetrachloroethane	ND	210	ug/kg
Toluene	ND	210	ug/kg
Chlorobenzene	ND	210	ug/kg
Ethylbenzene	ND	210	ug/kg
Styrene	ND	210	ug/kg
Xylenes (total)	ND	210	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	82	(59 - 138)
1,2-Dichloroethane-d4	82	(61 - 130)
Toluene-d8	80	(60 - 143)
4-Bromofluorobenzene	80	(47 - 158)

(Continued on next page)

EMT

Client Sample ID: SB32/33-131-E-000929

GC/MS Volatiles

Lot-Sample #...: A0J020163-002 **Work Order #...:** DLE6G102 **Matrix.....:** SO

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated result. Result is less than RL.

RMT

SB32/33-131-E-000929

GC/MS Volatiles

Lot-Sample #: A0J020163-002 **Work Order #:** DLE6G102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: FDUP32/33-026-000929

GC/MS Volatiles

Lot-Sample #...: A0J020163-003 Work Order #...: DLE6H102 Matrix.....: SO
Date Sampled...: 09/29/00 Date Received..: 10/02/00
Prep Date.....: 10/02/00 Analysis Date..: 10/05/00
Prep Batch #...: 0280214
Dilution Factor: 0.68
% Moisture.....: 19 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	420	ug/kg
Bromomethane	ND	420	ug/kg
Vinyl chloride	ND	420	ug/kg
Chloroethane	ND	420	ug/kg
Methylene chloride	ND	210	ug/kg
Acetone	840 B	840	ug/kg
Carbon disulfide	ND	210	ug/kg
1,1-Dichloroethene	ND	210	ug/kg
1,1-Dichloroethane	ND	210	ug/kg
1,2-Dichloroethene (total)	170 J	210	ug/kg
Chloroform	ND	210	ug/kg
1,2-Dichloroethane	ND	210	ug/kg
2-Butanone	ND	840	ug/kg
1,1,1-Trichloroethane	ND	210	ug/kg
Carbon tetrachloride	ND	210	ug/kg
Bromodichloromethane	ND	210	ug/kg
1,2-Dichloropropane	ND	210	ug/kg
cis-1,3-Dichloropropene	ND	210	ug/kg
Trichloroethene	2000	210	ug/kg
Dibromochloromethane	ND	210	ug/kg
1,1,2-Trichloroethane	ND	210	ug/kg
Benzene	ND	210	ug/kg
trans-1,3-Dichloropropene	ND	210	ug/kg
Bromoform	ND	210	ug/kg
4-Methyl-2-pentanone	ND	840	ug/kg
2-Hexanone	ND	840	ug/kg
Tetrachloroethene	ND	210	ug/kg
1,1,2,2-Tetrachloroethane	ND	210	ug/kg
Toluene	ND	210	ug/kg
Chlorobenzene	ND	210	ug/kg
Ethylbenzene	ND	210	ug/kg
Styrene	ND	210	ug/kg
Xylenes (total)	ND	210	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	84	(59 - 138)
1,2-Dichloroethane-d4	81	(61 - 130)
Toluene-d8	80	(60 - 143)
4-Bromofluorobenzene	82	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: FDUP32/33-026-000929

GC/MS Volatiles

Lot-Sample #...: A0J020163-003 Work Order #...: DLE6H102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated result. Result is less than RL.

RMT

FDUP32/33-026-000929

GC/MS Volatiles

Lot-Sample #: A0J020163-003 **Work Order #:** DLE6H102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: SB32/33-13~~3~~2-J-001004

GC/MS Volatiles

Lot-Sample #...: A0J050130-002 **Work Order #...:** DLK3A102 **Matrix.....:** SO
Date Sampled...: 10/04/00 10:42 **Date Received..:** 10/05/00
Prep Date.....: 10/05/00 **Analysis Date..:** 10/11/00
Prep Batch #...: 0284414
Dilution Factor: 0.76
% Moisture.....: 18 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	460	ug/kg
Bromomethane	ND	460	ug/kg
Vinyl chloride	ND	460	ug/kg
Chloroethane	ND	460	ug/kg
Methylene chloride	ND	230	ug/kg
Acetone	**1000 B**	**920**	**ug/kg**
Carbon disulfide	ND	230	ug/kg
1,1-Dichloroethene	ND	230	ug/kg
1,1-Dichloroethane	ND	230	ug/kg
1,2-Dichloroethene (total)	**110 J**	**230**	**ug/kg**
Chloroform	ND	230	ug/kg
1,2-Dichloroethane	ND	230	ug/kg
2-Butanone	ND	920	ug/kg
1,1,1-Trichloroethane	ND	230	ug/kg
Carbon tetrachloride	ND	230	ug/kg
Bromodichloromethane	ND	230	ug/kg
1,2-Dichloropropane	ND	230	ug/kg
cis-1,3-Dichloropropene	ND	230	ug/kg
Trichloroethene	**120 J**	**230**	**ug/kg**
Dibromochloromethane	ND	230	ug/kg
1,1,2-Trichloroethane	ND	230	ug/kg
Benzene	ND	230	ug/kg
trans-1,3-Dichloropropene	ND	230	ug/kg
Bromoform	ND	230	ug/kg
4-Methyl-2-pentanone	ND	920	ug/kg
2-Hexanone	ND	920	ug/kg
Tetrachloroethene	ND	230	ug/kg
1,1,2,2-Tetrachloroethane	ND	230	ug/kg
Toluene	ND	230	ug/kg
Chlorobenzene	ND	230	ug/kg
Ethylbenzene	ND	230	ug/kg
Styrene	ND	230	ug/kg
Xylenes (total)	ND	230	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	120	(59 - 138)
1,2-Dichloroethane-d4	121	(61 - 130)
Toluene-d8	127	(60 - 143)
4-Bromofluorobenzene	131	(47 - 158)

(Continued on next page)

DMT

Client Sample ID: SB32/33-133-J-001004

GC/MS Volatiles

Lot-Sample #...: A0J050130-002 Work Order #...: DLK3A102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated result. Result is less than RL.

RMT

SB32/33-132-J-001004

GC/MS Volatiles

Lot-Sample #: A0J050130-002 **Work Order #:** DLK3A102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Benzenamine, N,N-dimethyl-	121-69-7	600 NJ	M	10.827	ug/kg

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

RMT

Client Sample ID: SB32/33-133-E-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-006 Work Order #...: DLHKF102 Matrix.....: SO
Date Sampled...: 10/03/00 16:26 Date Received..: 10/04/00
Prep Date.....: 10/05/00 Analysis Date..: 10/10/00
Prep Batch #...: 0284414
Dilution Factor: 0.68
% Moisture.....: 18 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	410	ug/kg
Bromomethane	ND	410	ug/kg
Vinyl chloride	ND	410	ug/kg
Chloroethane	ND	410	ug/kg
Methylene chloride	ND	210	ug/kg
Acetone	630 J,B	830	ug/kg
Carbon disulfide	ND	210	ug/kg
1,1-Dichloroethene	ND	210	ug/kg
1,1-Dichloroethane	ND	210	ug/kg
1,2-Dichloroethene (total)	720	210	ug/kg
Chloroform	ND	210	ug/kg
1,2-Dichloroethane	ND	210	ug/kg
2-Butanone	ND	830	ug/kg
1,1,1-Trichloroethane	ND	210	ug/kg
Carbon tetrachloride	ND	210	ug/kg
Bromodichloromethane	ND	210	ug/kg
1,2-Dichloropropane	ND	210	ug/kg
cis-1,3-Dichloropropene	ND	210	ug/kg
Trichloroethene	190 J	210	ug/kg
Dibromochloromethane	ND	210	ug/kg
1,1,2-Trichloroethane	ND	210	ug/kg
Benzene	ND	210	ug/kg
trans-1,3-Dichloropropene	ND	210	ug/kg
Bromoform	ND	210	ug/kg
4-Methyl-2-pentanone	ND	830	ug/kg
2-Hexanone	ND	830	ug/kg
Tetrachloroethene	ND	210	ug/kg
1,1,2,2-Tetrachloroethane	ND	210	ug/kg
Toluene	ND	210	ug/kg
Chlorobenzene	ND	210	ug/kg
Ethylbenzene	ND	210	ug/kg
Styrene	ND	210	ug/kg
Xylenes (total)	ND	210	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	75	(59 - 138)
1,2-Dichloroethane-d4	72	(61 - 130)
Toluene-d8	77	(60 - 143)
4-Bromofluorobenzene	78	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-133-E-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-006 Work Order #...: DLHKF102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-133-E-001003

GC/MS Volatiles

Lot-Sample #: A0J040181-006 **Work Order #:** DLHKF102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: SB32/33-133-L-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-007 **Work Order #...:** DLHKH102 **Matrix.....:** SO
Date Sampled...: 10/03/00 16:46 **Date Received..:** 10/04/00
Prep Date.....: 10/05/00 **Analysis Date..:** 10/10/00
Prep Batch #...: 0284414
Dilution Factor: 0.71
% Moisture.....: 21 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	450	ug/kg
Bromomethane	ND	450	ug/kg
Vinyl chloride	ND	450	ug/kg
Chloroethane	ND	450	ug/kg
Methylene chloride	ND	230	ug/kg
Acetone	**670 J,B**	**900**	**ug/kg**
Carbon disulfide	ND	230	ug/kg
1,1-Dichloroethene	ND	230	ug/kg
1,1-Dichloroethane	ND	230	ug/kg
1,2-Dichloroethene (total)	**3700**	**230**	**ug/kg**
Chloroform	ND	230	ug/kg
1,2-Dichloroethane	ND	230	ug/kg
2-Butanone	ND	900	ug/kg
1,1,1-Trichloroethane	ND	230	ug/kg
Carbon tetrachloride	ND	230	ug/kg
Bromodichloromethane	ND	230	ug/kg
1,2-Dichloropropane	ND	230	ug/kg
cis-1,3-Dichloropropene	ND	230	ug/kg
Trichloroethene	**5900**	**230**	**ug/kg**
Dibromochloromethane	ND	230	ug/kg
1,1,2-Trichloroethane	ND	230	ug/kg
Benzene	ND	230	ug/kg
trans-1,3-Dichloropropene	ND	230	ug/kg
Bromoform	ND	230	ug/kg
4-Methyl-2-pentanone	ND	900	ug/kg
2-Hexanone	ND	900	ug/kg
Tetrachloroethene	ND	230	ug/kg
1,1,2,2-Tetrachloroethane	ND	230	ug/kg
Toluene	ND	230	ug/kg
Chlorobenzene	ND	230	ug/kg
Ethylbenzene	ND	230	ug/kg
Styrene	ND	230	ug/kg
Xylenes (total)	ND	230	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	71	(59 - 138)
1,2-Dichloroethane-d4	72	(61 - 130)
Toluene-d8	75	(60 - 143)
4-Bromofluorobenzene	75	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-133-L-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-007 Work Order #...: DLHKH102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-133-L-001003

GC/MS Volatiles

Lot-Sample #: A0J040181-007 **Work Order #:** DLHKH102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 12.53 / g Date Received: 10/18/00
Work Order: DWCSR1AC Date Extracted:10/19/00
Dilution factor: 0.8 Date Analyzed: 10/22/00
Moisture %:12

QC Batch: 0298668

Client Sample Id: SB32/33-134-B-001017

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	450	U
74-83-9	Bromomethane	450	U
75-01-4	Vinyl chloride	450	U
75-00-3	Chloroethane	450	U
75-09-2	Methylene chloride	640	B
67-64-1	Acetone	1200	B
75-15-0	Carbon disulfide	230	U
75-35-4	1,1-Dichloroethene	230	U
75-34-3	1,1-Dichloroethane	230	U
540-59-0	1,2-Dichloroethene (total)	230	U
67-66-3	Chloroform	230	U
107-06-2	1,2-Dichloroethane	230	U
78-93-3	2-Butanone	910	U
71-55-6	1,1,1-Trichloroethane	230	U
56-23-5	Carbon tetrachloride	230	U
75-27-4	Bromodichloromethane	230	U
78-87-5	1,2-Dichloropropane	230	U
10061-01-5	cis-1,3-Dichloropropene	230	U
79-01-6	Trichloroethene	230	U
124-48-1	Dibromochloromethane	230	U
79-00-5	1,1,2-Trichloroethane	230	U
71-43-2	Benzene	230	U
10061-02-6	trans-1,3-Dichloropropene	230	U
75-25-2	Bromoform	230	U
108-10-1	4-Methyl-2-pentanone	910	U
591-78-6	2-Hexanone	910	U
127-18-4	Tetrachloroethene	230	U
79-34-5	1,1,2,2-Tetrachloroethane	230	U

FORM I

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 12.53 / g Date Received: 10/18/00
Work Order: DNC5R1AC Date Extracted:10/19/00
Dilution factor: 0.8 Date Analyzed: 10/22/00
Moisture %:12

QC Batch: 0298668

Client Sample Id: SB32/33-134-B-001017

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	230	U
108-90-7	Chlorobenzene	230	U
100-41-4	Ethylbenzene	230	U
100-42-5	Styrene	230	U
1330-20-7	Xylenes (total)	230	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 001

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 12.53 / g Date Received: 10/18/00

Work Order: DMC5R1AC Date Extracted:10/19/00

Dilution factor: 0.8 Date Analyzed: 10/22/00

Moisture %:12

QC Batch: 0298668

Client Sample Id: SB32/33-134-B-001017

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.5 / g Date Received: 10/18/00
Work Order: DNC581AC Date Extracted:10/19/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:17

QC Batch: 0298668

Client Sample Id: SB32/33-134-G-001017

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	420	U
74-83-9	Bromomethane	420	U
75-01-4	Vinyl chloride	420	U
75-00-3	Chloroethane	420	U
75-09-2	Methylene chloride	550	B
67-64-1	Acetone	1000	B
75-15-0	Carbon disulfide	210	U
75-35-4	1,1-Dichloroethene	210	U
75-34-3	1,1-Dichloroethane	210	U
540-59-0	1,2-Dichloroethene (total)	69	J
67-66-3	Chloroform	210	U
107-06-2	1,2-Dichloroethane	210	U
78-93-3	2-Butanone	840	U
71-55-6	1,1,1-Trichloroethane	210	U
56-23-5	Carbon tetrachloride	210	U
75-27-4	Bromodichloromethane	210	U
78-87-5	1,2-Dichloropropane	210	U
10061-01-5	cis-1,3-Dichloropropene	210	U
79-01-6	Trichloroethene	210	U
124-48-1	Dibromochloromethane	210	U
79-00-5	1,1,2-Trichloroethane	210	U
71-43-2	Benzene	210	U
10061-02-6	trans-1,3-Dichloropropene	210	U
75-25-2	Bromoform	210	U
108-10-1	4-Methyl-2-pentanone	840	U
591-78-6	2-Hexanone	840	U
127-18-4	Tetrachloroethene	210	U
79-34-5	1,1,2,2-Tetrachloroethane	210	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.5 / g Date Received: 10/18/00
Work Order: DMC581AC Date Extracted:10/19/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:17

QC Batch: 0298668

Client Sample Id: SB32/33-134-G-001017

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	210	U
108-90-7	Chlorobenzene	210	U
100-41-4	Ethylbenzene	210	U
100-42-5	Styrene	210	U
1330-20-7	Xylenes (total)	210	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.5 / g Date Received: 10/18/00
Work Order: DNC581AC Date Extracted:10/19/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:17

QC Batch: 0298668

Client Sample Id: SB32/33-134-G-001017

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.14 / g Date Received: 10/18/00
Work Order: DWC591AC Date Extracted:10/19/00
Dilution factor: 0.76 Date Analyzed: 10/24/00
Moisture %:26

QC Batch: 0298668

Client Sample Id: SB32/33-134-K-001017

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	510	U
74-83-9	Bromomethane	510	U
75-01-4	Vinyl chloride	510	U
75-00-3	Chloroethane	510	U
75-09-2	Methylene chloride	730	B
67-64-1	Acetone	1000	B
75-15-0	Carbon disulfide	260	U
75-35-4	1,1-Dichloroethene	260	U
75-34-3	1,1-Dichloroethane	260	U
540-59-0	1,2-Dichloroethene (total)	440	
67-66-3	Chloroform	260	U
107-06-2	1,2-Dichloroethane	260	U
78-93-3	2-Butanone	1000	U
71-55-6	1,1,1-Trichloroethane	260	U
56-23-5	Carbon tetrachloride	260	U
75-27-4	Bromodichloromethane	260	U
78-87-5	1,2-Dichloropropane	260	U
10061-01-5	cis-1,3-Dichloropropene	260	U
79-01-6	Trichloroethene	220	J
124-48-1	Dibromochloromethane	260	U
79-00-5	1,1,2-Trichloroethane	260	U
71-43-2	Benzene	260	U
10061-02-6	trans-1,3-Dichloropropene	260	U
75-25-2	Bromoform	260	U
108-10-1	4-Methyl-2-pentanone	1000	U
591-78-6	2-Hexanone	1000	U
127-18-4	Tetrachloroethene	260	U
79-34-5	1,1,2,2-Tetrachloroethane	260	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.14 / g Date Received: 10/18/00
Work Order: DNC591AC Date Extracted:10/19/00
Dilution factor: 0.76 Date Analyzed: 10/24/00
Moisture %:26

QC Batch: 0298668

Client Sample Id: SB32/33-134-K-001017

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	260	U
108-90-7	Chlorobenzene	260	U
100-41-4	Ethylbenzene	260	U
100-42-5	Styrene	260	U
1330-20-7	Xylenes (total)	260	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.14 / g Date Received: 10/18/00
Work Order: DMC591AC Date Extracted:10/19/00
Dilution factor: 0.76 Date Analyzed: 10/24/00
Moisture %:26

QC Batch: 0298668

Client Sample Id: SB32/33-134-K-001017

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 15.26 / g Date Received: 10/18/00
Work Order: DNC6A1AC Date Extracted:10/19/00
Dilution factor: 0.66 Date Analyzed: 10/24/00
Moisture %:15

QC Batch: 0298668

Client Sample Id: SB32/33-134-N-001017

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	390	U
74-83-9	Bromomethane	390	U
75-01-4	Vinyl chloride	390	U
75-00-3	Chloroethane	390	U
75-09-2	**Methylene chloride**	**410**	**B**
67-64-1	**Acetone**	**840**	**B**
75-15-0	Carbon disulfide	190	U
75-35-4	1,1-Dichloroethene	190	U
75-34-3	1,1-Dichloroethane	190	U
540-59-0	**1,2-Dichloroethene (total)**	**680**	
67-66-3	Chloroform	190	U
107-06-2	1,2-Dichloroethane	190	U
78-93-3	2-Butanone	770	U
71-55-6	1,1,1-Trichloroethane	190	U
56-23-5	Carbon tetrachloride	190	U
75-27-4	Bromodichloromethane	190	U
78-87-5	1,2-Dichloropropane	190	U
10061-01-5	cis-1,3-Dichloropropene	190	U
79-01-6	**Trichloroethene**	**1100**	
124-48-1	Dibromochloromethane	190	U
79-00-5	1,1,2-Trichloroethane	190	U
71-43-2	Benzene	190	U
10061-02-6	trans-1,3-Dichloropropene	190	U
75-25-2	Bromoform	190	U
108-10-1	4-Methyl-2-pentanone	770	U
591-78-6	2-Hexanone	770	U
127-18-4	Tetrachloroethene	190	U
79-34-5	1,1,2,2-Tetrachloroethane	190	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180255 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 15.26 / g Date Received: 10/18/00
Work Order: DWC6A1AC Date Extracted:10/19/00
Dilution factor: 0.66 Date Analyzed: 10/24/00
Moisture %:15

QC Batch: 0298668

Client Sample Id: SB32/33-134-N-001017

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	190	U
108-90-7	Chlorobenzene	190	U
100-41-4	Ethylbenzene	190	U
100-42-5	Styrene	190	U
1330-20-7	Xylenes (total)	190	U

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FORM I

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0J13156

Matrix: (soil/water) SO Lab Sample ID: A0J180255 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 15.26 / g Date Received: 10/18/00
Work Order: DNC6A1AC Date Extracted: 10/19/00
Dilution factor: 0.66 Date Analyzed: 10/24/00
Moisture %: 15

QC Batch: 0298668

Client Sample Id: SB32/33-134-N-001017

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 11.63 / g Date Received: 09/19/00
Work Order: DKLVQ102 Date Extracted: 09/19/00
Dilution factor: 0.86 Date Analyzed: 09/25/00
Moisture %: 19

QC Batch: 0270360

Client Sample Id: SB32/33-200-K-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	530	U
74-83-9	Bromomethane	530	U
75-01-4	Vinyl chloride	530	U
75-00-3	Chloroethane	530	U
75-09-2	Methylene chloride	260	U
67-64-1	Acetone	860	J B
75-15-0	Carbon disulfide	260	U
75-35-4	1,1-Dichloroethene	260	U
75-34-3	1,1-Dichloroethane	260	U
540-59-0	1,2-Dichloroethene (total)	260	U
67-66-3	Chloroform	260	U
107-06-2	1,2-Dichloroethane	260	U
78-93-3	2-Butanone	1100	U
71-55-6	1,1,1-Trichloroethane	260	U
56-23-5	Carbon tetrachloride	260	U
75-27-4	Bromodichloromethane	260	U
78-87-5	1,2-Dichloropropane	260	U
10061-01-5	cis-1,3-Dichloropropene	260	U
79-01-6	Trichloroethene	260	U
124-48-1	Dibromochloromethane	260	U
79-00-5	1,1,2-Trichloroethane	260	U
71-43-2	Benzene	260	U
10061-02-6	trans-1,3-Dichloropropene	260	U
75-25-2	Bromoform	260	U
108-10-1	4-Methyl-2-pentanone	1100	U
591-78-6	2-Hexanone	1100	U
127-18-4	Tetrachloroethene	260	U
79-34-5	1,1,2,2-Tetrachloroethane	260	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 11.63 / g Date Received: 09/19/00
Work Order: DKLVQ102 Date Extracted: 09/19/00
Dilution factor: 0.86 Date Analyzed: 09/25/00
Moisture %: 19

QC Batch: 0270360

Client Sample Id: SB32/33-200-K-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	260	U
108-90-7	Chlorobenzene	260	U
100-41-4	Ethylbenzene	260	U
100-42-5	Styrene	260	U
1330-20-7	Xylenes (total)	260	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 001

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 11.63 / g Date Received: 09/19/00

Work Order: DKLVQ102 Date Extracted: 09/19/00

Dilution factor: 0.86 Date Analyzed: 09/25/00

Moisture %: 19

QC Batch: 0270360

Client Sample Id: SB32/33-200-K-000918

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I190242 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.97 / g Date Received: 09/19/00
Work Order: DKLWF102 Date Extracted:09/19/00
Dilution factor: 1.43 Date Analyzed: 09/25/00
Moisture %:18

QC Batch: 0270360

Client Sample Id: SB32/33-201-E-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	870	U
74-83-9	Bromomethane	870	U
75-01-4	Vinyl chloride	870	U
75-00-3	Chloroethane	870	U
75-09-2	Methylene chloride	440	U
67-64-1	**Acetone**	**940**	**J B**
75-15-0	Carbon disulfide	440	U
75-35-4	1,1-Dichloroethene	440	U
75-34-3	1,1-Dichloroethane	440	U
540-59-0	**1,2-Dichloroethene (total)**	**5500**	
67-66-3	Chloroform	440	U
107-06-2	1,2-Dichloroethane	440	U
78-93-3	2-Butanone	1700	U
71-55-6	1,1,1-Trichloroethane	440	U
56-23-5	Carbon tetrachloride	440	U
75-27-4	Bromodichloromethane	440	U
78-87-5	1,2-Dichloropropane	440	U
10061-01-5	cis-1,3-Dichloropropene	440	U
79-01-6	**Trichloroethene**	**14000**	
124-48-1	Dibromochloromethane	440	U
79-00-5	1,1,2-Trichloroethane	440	U
71-43-2	Benzene	440	U
10061-02-6	trans-1,3-Dichloropropene	440	U
75-25-2	Bromoform	440	U
108-10-1	4-Methyl-2-pentanone	1700	U
591-78-6	2-Hexanone	1700	U
127-18-4	**Tetrachloroethene**	**1900**	
79-34-5	1,1,2,2-Tetrachloroethane	440	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.97 / g Date Received: 09/19/00
Work Order: DKLWF102 Date Extracted: 09/19/00
Dilution factor: 1.43 Date Analyzed: 09/25/00
Moisture %: 18

QC Batch: 0270360

Client Sample Id: SB32/33-201-E-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	440	U
108-90-7	Chlorobenzene	140	J
100-41-4	Ethylbenzene	440	U
100-42-5	Styrene	440	U
1330-20-7	Xylenes (total)	440	U

FORM I

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I190242 003

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.97 / g Date Received: 09/19/00

Work Order: DKLWF102 Date Extracted:09/19/00

Dilution factor: 1.43 Date Analyzed: 09/25/00

Moisture %:18

QC Batch: 0270360

Client Sample Id: SB32/33-201-E-000918

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

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RMT

Client Sample ID: SB32/33-201-W-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-004 Work Order #...: DLFFL102 Matrix.....: SO
Date Sampled...: 10/02/00 14:21 Date Received..: 10/03/00
Prep Date.....: 10/04/00 Analysis Date..: 10/10/00
Prep Batch #...: 0283651
Dilution Factor: 0.69
% Moisture.....: 18 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	420	ug/kg
Bromomethane	ND	420	ug/kg
Vinyl chloride	ND	420	ug/kg
Chloroethane	ND	420	ug/kg
Methylene chloride	ND	210	ug/kg
Acetone	810 J,B	840	ug/kg
Carbon disulfide	ND	210	ug/kg
1,1-Dichloroethene	ND	210	ug/kg
1,1-Dichloroethane	ND	210	ug/kg
1,2-Dichloroethene (total)	ND	210	ug/kg
Chloroform	ND	210	ug/kg
1,2-Dichloroethane	ND	210	ug/kg
2-Butanone	ND	840	ug/kg
1,1,1-Trichloroethane	ND	210	ug/kg
Carbon tetrachloride	ND	210	ug/kg
Bromodichloromethane	ND	210	ug/kg
1,2-Dichloropropane	ND	210	ug/kg
cis-1,3-Dichloropropene	ND	210	ug/kg
Trichloroethene	ND	210	ug/kg
Dibromochloromethane	ND	210	ug/kg
1,1,2-Trichloroethane	ND	210	ug/kg
Benzene	ND	210	ug/kg
trans-1,3-Dichloropropene	ND	210	ug/kg
Bromoform	ND	210	ug/kg
4-Methyl-2-pentanone	ND	840	ug/kg
2-Hexanone	ND	840	ug/kg
Tetrachloroethene	ND	210	ug/kg
1,1,2,2-Tetrachloroethane	ND	210	ug/kg
Toluene	ND	210	ug/kg
Chlorobenzene	ND	210	ug/kg
Ethylbenzene	ND	210	ug/kg
Styrene	ND	210	ug/kg
Xylenes (total)	ND	210	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	73	(59 - 138)
1,2-Dichloroethane-d4	74	(61 - 130)
Toluene-d8	79	(60 - 143)
4-Bromofluorobenzene	77	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-201-W-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-004 Work Order #...: DLFFL102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-201-W-001002

GC/MS Volatiles

Lot-Sample #: A0J030148-004 **Work Order #:** DLFFL102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.28 / g Date Received: 09/19/00
Work Order: DKLWJ102 Date Extracted: 09/19/00
Dilution factor: 2 Date Analyzed: 09/25/00
Moisture %: 16

QC Batch: 0270360

Client Sample Id: SB32/33-202-F-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	1200	U
74-83-9	Bromomethane	1200	U
75-01-4	Vinyl chloride	1200	U
75-00-3	Chloroethane	1200	U
75-09-2	Methylene chloride	600	U
67-64-1	**Acetone**	**950**	**J B**
75-15-0	Carbon disulfide	600	U
75-35-4	1,1-Dichloroethene	600	U
75-34-3	1,1-Dichloroethane	600	U
540-59-0	**1,2-Dichloroethene (total)**	**5000**	
67-66-3	Chloroform	600	U
107-06-2	1,2-Dichloroethane	600	U
78-93-3	2-Butanone	2400	U
71-55-6	1,1,1-Trichloroethane	600	U
56-23-5	Carbon tetrachloride	600	U
75-27-4	Bromodichloromethane	600	U
78-87-5	1,2-Dichloropropane	600	U
10061-01-5	cis-1,3-Dichloropropene	600	U
79-01-6	**Trichloroethene**	**17000**	
124-48-1	Dibromochloromethane	600	U
79-00-5	1,1,2-Trichloroethane	600	U
71-43-2	Benzene	600	U
10061-02-6	trans-1,3-Dichloropropene	600	U
75-25-2	Bromoform	600	U
108-10-1	4-Methyl-2-pentanone	2400	U
591-78-6	2-Hexanone	2400	U
127-18-4	Tetrachloroethene	600	U
79-34-5	1,1,2,2-Tetrachloroethane	600	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.28 / g Date Received: 09/19/00
Work Order: DKLWJ102 Date Extracted: 09/19/00
Dilution factor: 2 Date Analyzed: 09/25/00
Moisture %: 16

QC Batch: 0270360

Client Sample Id: SB32/33-202-F-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	600	U
108-90-7	Chlorobenzene	750	
100-41-4	Ethylbenzene	600	U
100-42-5	Styrene	600	U
1330-20-7	Xylenes (total)	600	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.28 / g Date Received: 09/19/00
Work Order: DKLWJ102 Date Extracted: 09/19/00
Dilution factor: 2 Date Analyzed: 09/25/00
Moisture %: 16

QC Batch: 0270360

Client Sample Id: SB32/33-202-F-000918

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 006
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 09/19/00
Work Order: DKLWP102 Date Extracted: 09/19/00
Dilution factor: 0.99 Date Analyzed: 09/25/00
Moisture %: 16

QC Batch: 0270360

Client Sample Id: FDUP32/33-012-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	590	U
74-83-9	Bromomethane	590	U
75-01-4	Vinyl chloride	590	U
75-00-3	Chloroethane	590	U
75-09-2	Methylene chloride	300	U
67-64-1	Acetone	810	J B
75-15-0	Carbon disulfide	300	U
75-35-4	1,1-Dichloroethene	300	U
75-34-3	1,1-Dichloroethane	300	U
540-59-0	1,2-Dichloroethene (total)	3100	
67-66-3	Chloroform	300	U
107-06-2	1,2-Dichloroethane	300	U
78-93-3	2-Butanone	1200	U
71-55-6	1,1,1-Trichloroethane	300	U
56-23-5	Carbon tetrachloride	300	U
75-27-4	Bromodichloromethane	300	U
78-87-5	1,2-Dichloropropane	300	U
10061-01-5	cis-1,3-Dichloropropene	300	U
79-01-6	Trichloroethene	9900	
124-48-1	Dibromochloromethane	300	U
79-00-5	1,1,2-Trichloroethane	300	U
71-43-2	Benzene	300	U
10061-02-6	trans-1,3-Dichloropropene	300	U
75-25-2	Bromoform	300	U
108-10-1	4-Methyl-2-pentanone	1200	U
591-78-6	2-Hexanone	1200	U
127-18-4	Tetrachloroethene	300	U
79-34-5	1,1,2,2-Tetrachloroethane	300	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 006
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 09/19/00
Work Order: DKLWP102 Date Extracted: 09/19/00
Dilution factor: 0.99 Date Analyzed: 09/25/00
Moisture %: 16

QC Batch: 0270360

Client Sample Id: FDUP32/33-012-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	300	U
108-90-7	**Chlorobenzene**	**530**	
100-41-4	Ethylbenzene	300	U
100-42-5	Styrene	300	U
1330-20-7	Xylenes (total)	300	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 006

Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 09/19/00

Work Order: DKLWP102 Date Extracted: 09/19/00

Dilution factor: 0.99 Date Analyzed: 09/25/00

Moisture %: 16

QC Batch: 0270360

Client Sample Id: FDUP32/33-012-000918

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

RMT

Client Sample ID: SB32/33-210-W-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-006 **Work Order #...:** DLFFW102 **Matrix.....:** SO
Date Sampled...: 10/02/00 16:37 **Date Received..:** 10/03/00
Prep Date.....: 10/04/00 **Analysis Date..:** 10/10/00
Prep Batch #...: 0283651
Dilution Factor: 0.67
% Moisture.....: 18 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	410	ug/kg
Bromomethane	ND	410	ug/kg
Vinyl chloride	ND	410	ug/kg
Chloroethane	ND	410	ug/kg
Methylene chloride	ND	200	ug/kg
Acetone	**760 J,B**	**820**	**ug/kg**
Carbon disulfide	ND	200	ug/kg
1,1-Dichloroethene	ND	200	ug/kg
1,1-Dichloroethane	ND	200	ug/kg
1,2-Dichloroethene (total)	ND	200	ug/kg
Chloroform	ND	200	ug/kg
1,2-Dichloroethane	ND	200	ug/kg
2-Butanone	ND	820	ug/kg
1,1,1-Trichloroethane	ND	200	ug/kg
Carbon tetrachloride	ND	200	ug/kg
Bromodichloromethane	ND	200	ug/kg
1,2-Dichloropropane	ND	200	ug/kg
cis-1,3-Dichloropropene	ND	200	ug/kg
Trichloroethene	ND	200	ug/kg
Dibromochloromethane	ND	200	ug/kg
1,1,2-Trichloroethane	ND	200	ug/kg
Benzene	ND	200	ug/kg
trans-1,3-Dichloropropene	ND	200	ug/kg
Bromoform	ND	200	ug/kg
4-Methyl-2-pentanone	ND	820	ug/kg
2-Hexanone	ND	820	ug/kg
Tetrachloroethene	ND	200	ug/kg
1,1,2,2-Tetrachloroethane	ND	200	ug/kg
Toluene	ND	200	ug/kg
Chlorobenzene	ND	200	ug/kg
Ethylbenzene	ND	200	ug/kg
Styrene	ND	200	ug/kg
Xylenes (total)	ND	200	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	72	(59 - 138)
1,2-Dichloroethane-d4	72	(61 - 130)
Toluene-d8	78	(60 - 143)
4-Bromofluorobenzene	77	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-210-W-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-006 Work Order #...: DLFFW102 Matrix.....: SO

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-210-W-001002

GC/MS Volatiles

Lot-Sample #: A0J030148-006 **Work Order #:** DLFFW102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I210215 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 09/21/00
Work Order: DKRFX102 Date Extracted: 09/22/00
Dilution factor: 0.69 Date Analyzed: 09/27/00
Moisture %: 17

QC Batch: 0270539

Client Sample Id: SB32/33-211-J-000920

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	420	U
74-83-9	Bromomethane	420	U
75-01-4	Vinyl chloride	420	U
75-00-3	Chloroethane	420	U
75-09-2	Methylene chloride	79	J B
67-64-1	Acetone	670	J B
75-15-0	Carbon disulfide	210	U
75-35-4	1,1-Dichloroethene	210	U
75-34-3	1,1-Dichloroethane	210	U
540-59-0	1,2-Dichloroethene (total)	210	U
67-66-3	Chloroform	210	U
107-06-2	1,2-Dichloroethane	210	U
78-93-3	2-Butanone	840	U
71-55-6	1,1,1-Trichloroethane	210	U
56-23-5	Carbon tetrachloride	210	U
75-27-4	Bromodichloromethane	210	U
78-87-5	1,2-Dichloropropane	210	U
10061-01-5	cis-1,3-Dichloropropene	210	U
79-01-6	Trichloroethene	310	
124-48-1	Dibromochloromethane	210	U
79-00-5	1,1,2-Trichloroethane	210	U
71-43-2	Benzene	210	U
10061-02-6	trans-1,3-Dichloropropene	210	U
75-25-2	Bromoform	210	U
108-10-1	4-Methyl-2-pentanone	840	U
591-78-6	2-Hexanone	840	U
127-18-4	Tetrachloroethene	210	U
79-34-5	1,1,2,2-Tetrachloroethane	210	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I210215 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 09/21/00
Work Order: DKRFX102 Date Extracted:09/22/00
Dilution factor: 0.69 Date Analyzed: 09/27/00
Moisture %:17

QC Batch: 0270539

Client Sample Id: SB32/33-211-J-000920

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	210	U
108-90-7	Chlorobenzene	210	U
100-41-4	Ethylbenzene	210	U
100-42-5	Styrene	210	U
1330-20-7	Xylenes (total)	210	U

FORM I

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RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I210215 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 09/21/00
Work Order: DKRFX102 Date Extracted:09/22/00
Dilution factor: 0.69 Date Analyzed: 09/27/00
Moisture %:17

QC Batch: 0270539

Client Sample Id: SB32/33-211-J-000920

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

134

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I210215 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 09/21/00
Work Order: DKRFH102 Date Extracted: 09/22/00
Dilution factor: 2.78 Date Analyzed: 09/28/00
Moisture %: 18

QC Batch: 0270539

Client Sample Id: SB32/33-212-J-000920

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	1700	U
74-83-9	Bromomethane	1700	U
75-01-4	Vinyl chloride	1700	U
75-00-3	Chloroethane	1700	U
75-09-2	Methylene chloride	370	J B
67-64-1	Acetone	1300	J B
75-15-0	Carbon disulfide	840	U
75-35-4	1,1-Dichloroethene	840	U
75-34-3	1,1-Dichloroethane	840	U
540-59-0	1,2-Dichloroethene (total)	330	J
67-66-3	Chloroform	840	U
107-06-2	1,2-Dichloroethane	840	U
78-93-3	2-Butanone	3400	U
71-55-6	1,1,1-Trichloroethane	840	U
56-23-5	Carbon tetrachloride	840	U
75-27-4	Bromodichloromethane	840	U
78-87-5	1,2-Dichloropropane	840	U
10061-01-5	cis-1,3-Dichloropropene	840	U
79-01-6	Trichloroethene	8700	
124-48-1	Dibromochloromethane	840	U
79-00-5	1,1,2-Trichloroethane	840	U
71-43-2	Benzene	840	U
10061-02-6	trans-1,3-Dichloropropene	840	U
75-25-2	Bromoform	840	U
108-10-1	4-Methyl-2-pentanone	3400	U
591-78-6	2-Hexanone	3400	U
127-18-4	Tetrachloroethene	330	J
79-34-5	1,1,2,2-Tetrachloroethane	840	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I210215 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 09/21/00
Work Order: DKRFH102 Date Extracted: 09/22/00
Dilution factor: 2.78 Date Analyzed: 09/28/00
Moisture %: 18

QC Batch: 0270539

Client Sample Id: SB32/33-212-J-000920

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	840	U
108-90-7	Chlorobenzene	840	U
100-41-4	Ethylbenzene	840	U
100-42-5	Styrene	840	U
1330-20-7	Xylenes (total)	840	U

FORM I

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RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I210215 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 09/21/00
Work Order: DKRFH102 Date Extracted:09/22/00
Dilution factor: 2.78 Date Analyzed: 09/28/00
Moisture %:18

QC Batch: 0270539

Client Sample Id: SB32/33-212-J-000920

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	1,4-Dichlorobenzene	9.811	960	
	1,2,4-Trichlorobenzene	11.787	27000	
	1,2,3-Trichlorobenzene	12.272	4400	

BMT

Client Sample ID: SB32/33-217-T

GC/MS Volatiles

Lot-Sample #...: A0I300124-001 Work Order #...: DLCNV101 Matrix.....: SO
Date Sampled...: 09/28/00 Date Received..: 09/29/00
Prep Date.....: 10/06/00 Analysis Date..: 10/09/00
Prep Batch #...: 0283255
Dilution Factor: 133.33
% Moisture.....: Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	67000	ug/kg
Bromomethane	ND	67000	ug/kg
Vinyl chloride	ND	67000	ug/kg
Chloroethane	ND	67000	ug/kg
Methylene chloride	ND	33000	ug/kg
Acetone	21000 J,B	130000	ug/kg
Carbon disulfide	ND	33000	ug/kg
1,1-Dichloroethene	ND	33000	ug/kg
1,1-Dichloroethane	ND	33000	ug/kg
1,2-Dichloroethene (total)	ND	33000	ug/kg
Chloroform	ND	33000	ug/kg
1,2-Dichloroethane	ND	33000	ug/kg
2-Butanone	ND	130000	ug/kg
1,1,1-Trichloroethane	ND	33000	ug/kg
Carbon tetrachloride	ND	33000	ug/kg
Bromodichloromethane	ND	33000	ug/kg
1,2-Dichloropropane	ND	33000	ug/kg
cis-1,3-Dichloropropene	ND	33000	ug/kg
Trichloroethene	28000 J	33000	ug/kg
Dibromochloromethane	ND	33000	ug/kg
1,1,2-Trichloroethane	ND	33000	ug/kg
Benzene	ND	33000	ug/kg
trans-1,3-Dichloropropene	ND	33000	ug/kg
Bromoform	ND	33000	ug/kg
4-Methyl-2-pentanone	ND	130000	ug/kg
2-Hexanone	ND	130000	ug/kg
Tetrachloroethene	24000 J	33000	ug/kg
1,1,2,2-Tetrachloroethane	ND	33000	ug/kg
Toluene	ND	33000	ug/kg
Chlorobenzene	ND	33000	ug/kg
Ethylbenzene	ND	33000	ug/kg
Styrene	ND	33000	ug/kg
Xylenes (total)	ND	33000	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	0.0 DIL,*	(59 - 138)
1,2-Dichloroethane-d4	0.0 DIL,*	(61 - 130)
Toluene-d8	1.3 DIL,*	(60 - 143)
4-Bromofluorobenzene	2.9 DIL,*	(47 - 158)

(Continued on next page)

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RMT

Client Sample ID: SB32/33-217-T

GC/MS Volatiles

Lot-Sample #...: A0I300124-001 Work Order #...: DLCNV101 Matrix.....: SO

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Elevated reporting limits due to TICs.

EMT

SB32/33-217-T

GC/MS Volatiles

Lot-Sample #: A0I300124-001 Work Order #: DLCMV101 Matrix: SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
1,2,4-Trichlorobenzene		1000000	Q	11.777	ug/kg
1,2,3-Trichlorobenzene		140000	Q	12.274	ug/kg

NOTE(S):

Q: Result was quantitated against the response factor of a calibration standard.

140

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.13 / g Date Received: 10/17/00
Work Order: DNCWW1AC Date Extracted:10/18/00
Dilution factor: 0.71 Date Analyzed: 10/22/00
Moisture %:15

QC Batch: 0297375

Client Sample Id: SB32/33-306-E-001016

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	420	U
74-83-9	Bromomethane	420	U
75-01-4	Vinyl chloride	420	U
75-00-3	Chloroethane	420	U
75-09-2	Methylene chloride	1100	B
67-64-1	Acetone	1000	B
75-15-0	Carbon disulfide	210	U
75-35-4	1,1-Dichloroethene	210	U
75-34-3	1,1-Dichloroethane	210	U
540-59-0	1,2-Dichloroethene (total)	210	U
67-66-3	Chloroform	210	U
107-06-2	1,2-Dichloroethane	210	U
78-93-3	2-Butanone	840	U
71-55-6	1,1,1-Trichloroethane	210	U
56-23-5	Carbon tetrachloride	210	U
75-27-4	Bromodichloromethane	210	U
78-87-5	1,2-Dichloropropane	210	U
10061-01-5	cis-1,3-Dichloropropene	210	U
79-01-6	Trichloroethene	210	U
124-48-1	Dibromochloromethane	210	U
79-00-5	1,1,2-Trichloroethane	210	U
71-43-2	Benzene	210	U
10061-02-6	trans-1,3-Dichloropropene	210	U
75-25-2	Bromoform	210	U
108-10-1	4-Methyl-2-pentanone	840	U
591-78-6	2-Hexanone	840	U
127-18-4	Tetrachloroethene	210	U
79-34-5	1,1,2,2-Tetrachloroethane	210	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.13 / g Date Received: 10/17/00
Work Order: DMCWW1AC Date Extracted:10/18/00
Dilution factor: 0.71 Date Analyzed: 10/22/00
Moisture %:15

QC Batch: 0297375

Client Sample Id: SB32/33-306-E-001016

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	210	U
108-90-7	Chlorobenzene	210	U
100-41-4	Ethylbenzene	210	U
100-42-5	Styrene	210	U
1330-20-7	Xylenes (total)	210	U

FORM I

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.13 / g Date Received: 10/17/00
Work Order: DNCWW1AC Date Extracted:10/18/00
Dilution factor: 0.71 Date Analyzed: 10/22/00
Moisture %:15

QC Batch: 0297375

Client Sample Id: SB32/33-306-E-001016

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0J13156

Matrix: (soil/water) SO Lab Sample ID: A0J180230 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.7 / g Date Received: 10/17/00
Work Order: DNCW31AC Date Extracted: 10/18/00
Dilution factor: 0.73 Date Analyzed: 10/22/00
Moisture %: 18

QC Batch: 0297375

Client Sample Id: SB32/33-306-K-001016

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	440	U
74-83-9	Bromomethane	440	U
75-01-4	Vinyl chloride	440	U
75-00-3	Chloroethane	440	U
75-09-2	Methylene chloride	700	B
67-64-1	Acetone	980	B
75-15-0	Carbon disulfide	220	U
75-35-4	1,1-Dichloroethene	220	U
75-34-3	1,1-Dichloroethane	220	U
540-59-0	1,2-Dichloroethene (total)	220	U
67-66-3	Chloroform	220	U
107-06-2	1,2-Dichloroethane	220	U
78-93-3	2-Butanone	890	U
71-55-6	1,1,1-Trichloroethane	220	U
56-23-5	Carbon tetrachloride	220	U
75-27-4	Bromodichloromethane	220	U
78-87-5	1,2-Dichloropropane	220	U
10061-01-5	cis-1,3-Dichloropropene	220	U
79-01-6	Trichloroethene	220	U
124-48-1	Dibromochloromethane	220	U
79-00-5	1,1,2-Trichloroethane	220	U
71-43-2	Benzene	220	U
10061-02-6	trans-1,3-Dichloropropene	220	U
75-25-2	Bromoform	220	U
108-10-1	4-Methyl-2-pentanone	890	U
591-78-6	2-Hexanone	890	U
127-18-4	Tetrachloroethene	220	U
79-34-5	1,1,2,2-Tetrachloroethane	220	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.7 / g Date Received: 10/17/00
Work Order: DNCW31AC Date Extracted:10/18/00
Dilution factor: 0.73 Date Analyzed: 10/22/00
Moisture %:18

QC Batch: 0297375

Client Sample Id: SB32/33-306-K-001016

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	220	U
108-90-7	Chlorobenzene	220	U
100-41-4	Ethylbenzene	220	U
100-42-5	Styrene	220	U
1330-20-7	Xylenes (total)	220	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.7 / g Date Received: 10/17/00
Work Order: DNCW31AC Date Extracted:10/18/00
Dilution factor: 0.73 Date Analyzed: 10/22/00
Moisture %:18

QC Batch: 0297375

Client Sample Id: SB32/33-306-K-001016

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.23 / g Date Received: 10/17/00
Work Order: DNCW51AC Date Extracted:10/18/00
Dilution factor: 0.7 Date Analyzed: 10/22/00
Moisture %:17

QC Batch: 0297375

Client Sample Id: SB32/33-306-P-001016

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	420	U
74-83-9	Bromomethane	420	U
75-01-4	Vinyl chloride	420	U
75-00-3	Chloroethane	420	U
75-09-2	**Methylene chloride**	**600**	**B**
67-64-1	**Acetone**	**1000**	**B**
75-15-0	Carbon disulfide	210	U
75-35-4	1,1-Dichloroethene	210	U
75-34-3	1,1-Dichloroethane	210	U
540-59-0	1,2-Dichloroethene (total)	210	U
67-66-3	Chloroform	210	U
107-06-2	1,2-Dichloroethane	210	U
78-93-3	2-Butanone	850	U
71-55-6	1,1,1-Trichloroethane	210	U
56-23-5	Carbon tetrachloride	210	U
75-27-4	Bromodichloromethane	210	U
78-87-5	1,2-Dichloropropane	210	U
10061-01-5	cis-1,3-Dichloropropene	210	U
79-01-6	Trichloroethene	210	U
124-48-1	Dibromochloromethane	210	U
79-00-5	1,1,2-Trichloroethane	210	U
71-43-2	Benzene	210	U
10061-02-6	trans-1,3-Dichloropropene	210	U
75-25-2	Bromoform	210	U
108-10-1	4-Methyl-2-pentanone	850	U
591-78-6	2-Hexanone	850	U
127-18-4	Tetrachloroethene	210	U
79-34-5	1,1,2,2-Tetrachloroethane	210	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.23 / g Date Received: 10/17/00
Work Order: DMCW51AC Date Extracted:10/18/00
Dilution factor: 0.7 Date Analyzed: 10/22/00
Moisture %:17

QC Batch: 0297375

Client Sample Id: SB32/33-306-P-001016

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	210	U
108-90-7	Chlorobenzene	210	U
100-41-4	Ethylbenzene	210	U
100-42-5	Styrene	210	U
1330-20-7	Xylenes (total)	210	U

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RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 003

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.23 / g Date Received: 10/17/00

Work Order: DNCW51AC Date Extracted:10/18/00

Dilution factor: 0.7 Date Analyzed: 10/22/00

Moisture %:17

QC Batch: 0297375

Client Sample Id: SB32/33-306-P-001016

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

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Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) WQ Lab Sample ID:A0J180230 006
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.49 / g Date Received: 10/17/00
Work Order: DMCX21AC Date Extracted:10/18/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:20

QC Batch: 0297375

Client Sample Id: FDUP32/33-039-001016

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	430	U
74-83-9	Bromomethane	430	U
75-01-4	Vinyl chloride	430	U
75-00-3	Chloroethane	430	U
75-09-2	Methylene chloride	800	B
67-64-1	Acetone	1100	B
75-15-0	Carbon disulfide	220	U
75-35-4	1,1-Dichloroethene	220	U
75-34-3	1,1-Dichloroethane	220	U
540-59-0	1,2-Dichloroethene (total)	220	U
67-66-3	Chloroform	220	U
107-06-2	1,2-Dichloroethane	220	U
78-93-3	2-Butanone	860	U
71-55-6	1,1,1-Trichloroethane	220	U
56-23-5	Carbon tetrachloride	220	U
75-27-4	Bromodichloromethane	220	U
78-87-5	1,2-Dichloropropane	220	U
10061-01-5	cis-1,3-Dichloropropene	220	U
79-01-6	Trichloroethene	220	U
124-48-1	Dibromochloromethane	220	U
79-00-5	1,1,2-Trichloroethane	220	U
71-43-2	Benzene	220	U
10061-02-6	trans-1,3-Dichloropropene	220	U
75-25-2	Bromoform	220	U
108-10-1	4-Methyl-2-pentanone	860	U
591-78-6	2-Hexanone	860	U
127-18-4	Tetrachloroethene	220	U
79-34-5	1,1,2,2-Tetrachloroethane	220	U

150

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) WQ Lab Sample ID:A0J180230 006
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.49 / g Date Received: 10/17/00
Work Order: DNCX21AC Date Extracted:10/18/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:20

QC Batch: 0297375

Client Sample Id: FDUP32/33-039-001016

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	220	U
108-90-7	Chlorobenzene	220	U
100-41-4	Ethylbenzene	220	U
100-42-5	Styrene	220	U
1330-20-7	Xylenes (total)	220	U

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FORM I

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) WQ Lab Sample ID:A0J180230 006

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.49 / g Date Received: 10/17/00

Work Order: D8CX21AC Date Extracted:10/18/00

Dilution factor: 0.69 Date Analyzed: 10/22/00

Moisture %:20

QC Batch: 0297375

Client Sample Id: FDUP32/33-039-001016

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None =			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.6 / g Date Received: 10/17/00
Work Order: DNCXL1AC Date Extracted:10/18/00
Dilution factor: 0.68 Date Analyzed: 10/22/00
Moisture %:19

QC Batch: 0297375

Client Sample Id: SB32/33-306-W-001016

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	420	U
74-83-9	Bromomethane	420	U
75-01-4	Vinyl chloride	420	U
75-00-3	Chloroethane	420	U
75-09-2	Methylene chloride	1700	B
67-64-1	Acetone	1100	B
75-15-0	Carbon disulfide	210	U
75-35-4	1,1-Dichloroethene	210	U
75-34-3	1,1-Dichloroethane	210	U
540-59-0	1,2-Dichloroethene (total)	210	U
67-66-3	Chloroform	210	U
107-06-2	1,2-Dichloroethane	210	U
78-93-3	2-Butanone	840	U
71-55-6	1,1,1-Trichloroethane	210	U
56-23-5	Carbon tetrachloride	210	U
75-27-4	Bromodichloromethane	210	U
78-87-5	1,2-Dichloropropane	210	U
10061-01-5	cis-1,3-Dichloropropene	210	U
79-01-6	Trichloroethene	210	U
124-48-1	Dibromochloromethane	210	U
79-00-5	1,1,2-Trichloroethane	210	U
71-43-2	Benzene	210	U
10061-02-6	trans-1,3-Dichloropropene	210	U
75-25-2	Bromoform	210	U
108-10-1	4-Methyl-2-pentanone	840	U
591-78-6	2-Hexanone	840	U
127-18-4	Tetrachloroethene	210	U
79-34-5	1,1,2,2-Tetrachloroethane	210	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.6 / g Date Received: 10/17/00
Work Order: D8CXL1AC Date Extracted:10/18/00
Dilution factor: 0.68 Date Analyzed: 10/22/00
Moisture %:19

QC Batch: 0297375

Client Sample Id: SB32/33-306-W-001016

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	210	U
108-90-7	Chlorobenzene	210	U
100-41-4	Ethylbenzene	210	U
100-42-5	Styrene	210	U
1330-20-7	Xylenes (total)	210	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J180230 004

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.6 / g Date Received: 10/17/00

Work Order: DNCXL1AC Date Extracted:10/18/00

Dilution factor: 0.68 Date Analyzed: 10/22/00

Moisture %:19

QC Batch: 0297375

Client Sample Id: SB32/33-306-W-001016

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I190242 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.99 / g Date Received: 09/19/00
Work Order: DKLWM102 Date Extracted:09/19/00
Dilution factor: 0.71 Date Analyzed: 09/25/00
Moisture %:24

QC Batch: 0270360

Client Sample Id: SB32/33-403-O-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	470	U
74-83-9	Bromomethane	470	U
75-01-4	Vinyl chloride	470	U
75-00-3	Chloroethane	470	U
75-09-2	Methylene chloride	60	J
67-64-1	Acetone	730	J B
75-15-0	Carbon disulfide	230	U
75-35-4	1,1-Dichloroethene	230	U
75-34-3	1,1-Dichloroethane	230	U
540-59-0	1,2-Dichloroethene (total)	490	
67-66-3	Chloroform	230	U
107-06-2	1,2-Dichloroethane	230	U
78-93-3	2-Butanone	940	U
71-55-6	1,1,1-Trichloroethane	230	U
56-23-5	Carbon tetrachloride	230	U
75-27-4	Bromodichloromethane	230	U
78-87-5	1,2-Dichloropropane	230	U
10061-01-5	cis-1,3-Dichloropropene	230	U
79-01-6	Trichloroethene	7200	
124-48-1	Dibromochloromethane	230	U
79-00-5	1,1,2-Trichloroethane	230	U
71-43-2	Benzene	230	U
10061-02-6	trans-1,3-Dichloropropene	230	U
75-25-2	Bromoform	230	U
108-10-1	4-Methyl-2-pentanone	940	U
591-78-6	2-Hexanone	940	U
127-18-4	Tetrachloroethene	1300	
79-34-5	1,1,2,2-Tetrachloroethane	230	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I190242 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.99 / g Date Received: 09/19/00
Work Order: DKLWM102 Date Extracted:09/19/00
Dilution factor: 0.71 Date Analyzed: 09/25/00
Moisture %:24

QC Batch: 0270360

Client Sample Id: SB32/33-403-O-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	230	U
108-90-7	Chlorobenzene	230	U
100-41-4	Ethylbenzene	230	U
100-42-5	Styrene	230	U
1330-20-7	Xylenes (total)	230	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 005

Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.99 / g Date Received: 09/19/00

Work Order: DKLWM102 Date Extracted: 09/19/00

Dilution factor: 0.71 Date Analyzed: 09/25/00

Moisture %: 24

QC Batch: 0270360

Client Sample Id: SB32/33-403-O-000918

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

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Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.89 / g Date Received: 09/19/00
Work Order: DKLWA102 Date Extracted: 09/19/00
Dilution factor: 1.44 Date Analyzed: 09/25/00
Moisture %: 23

QC Batch: 0270360

Client Sample Id: SB32/33-407-S-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	940	U
74-83-9	Bromomethane	940	U
75-01-4	Vinyl chloride	940	U
75-00-3	Chloroethane	940	U
75-09-2	Methylene chloride	470	U
67-64-1	**Acetone**	**940**	**J B**
75-15-0	Carbon disulfide	470	U
75-35-4	1,1-Dichloroethene	470	U
75-34-3	1,1-Dichloroethane	470	U
540-59-0	**1,2-Dichloroethene (total)**	**270**	**J**
67-66-3	Chloroform	470	U
107-06-2	1,2-Dichloroethane	470	U
78-93-3	2-Butanone	1900	U
71-55-6	1,1,1-Trichloroethane	470	U
56-23-5	Carbon tetrachloride	470	U
75-27-4	Bromodichloromethane	470	U
78-87-5	1,2-Dichloropropane	470	U
10061-01-5	cis-1,3-Dichloropropene	470	U
79-01-6	**Trichloroethene**	**15000**	
124-48-1	Dibromochloromethane	470	U
79-00-5	1,1,2-Trichloroethane	470	U
71-43-2	Benzene	470	U
10061-02-6	trans-1,3-Dichloropropene	470	U
75-25-2	Bromoform	470	U
108-10-1	4-Methyl-2-pentanone	1900	U
591-78-6	2-Hexanone	1900	U
127-18-4	**Tetrachloroethene**	**5000**	
79-34-5	1,1,2,2-Tetrachloroethane	470	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.89 / g Date Received: 09/19/00
Work Order: DKLWA102 Date Extracted: 09/19/00
Dilution factor: 1.44 Date Analyzed: 09/25/00
Moisture %: 23

QC Batch: 0270360

Client Sample Id: SB32/33-407-S-000918

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	470	U
108-90-7	Chlorobenzene	470	U
100-41-4	Ethylbenzene	470	U
100-42-5	Styrene	470	U
1330-20-7	Xylenes (total)	470	U

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RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I190242 002

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.89 / g Date Received: 09/19/00

Work Order: DKLWA102 Date Extracted: 09/19/00

Dilution factor: 1.44 Date Analyzed: 09/25/00

Moisture %: 23

QC Batch: 0270360

Client Sample Id: SB32/33-407-S-000918

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

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Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I160164 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.43 / g Date Received: 09/16/00
Work Order: DKHHX102 Date Extracted:09/16/00
Dilution factor: 0.69 Date Analyzed: 09/21/00
Moisture %:19

QC Batch: 0266391

Client Sample Id: SB32/33-410-O-000915

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	420	U
74-83-9	Bromomethane	420	U
75-01-4	Vinyl chloride	420	U
75-00-3	Chloroethane	420	U
75-09-2	Methylene chloride	210	U
67-64-1	Acetone	560	J B
75-15-0	Carbon disulfide	210	U
75-35-4	1,1-Dichloroethene	210	U
75-34-3	1,1-Dichloroethane	210	U
540-59-0	1,2-Dichloroethene (total)	210	U
67-66-3	Chloroform	210	U
107-06-2	1,2-Dichloroethane	210	U
78-93-3	2-Butanone	850	U
71-55-6	1,1,1-Trichloroethane	210	U
56-23-5	Carbon tetrachloride	210	U
75-27-4	Bromodichloromethane	210	U
78-87-5	1,2-Dichloropropane	210	U
10061-01-5	cis-1,3-Dichloropropene	210	U
79-01-6	Trichloroethene	710	
124-48-1	Dibromochloromethane	210	U
79-00-5	1,1,2-Trichloroethane	210	U
71-43-2	Benzene	210	U
10061-02-6	trans-1,3-Dichloropropene	210	U
75-25-2	Bromoform	210	U
108-10-1	4-Methyl-2-pentanone	850	U
591-78-6	2-Hexanone	850	U
127-18-4	Tetrachloroethene	210	U
79-34-5	1,1,2,2-Tetrachloroethane	210	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I160164 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.43 / g Date Received: 09/16/00
Work Order: DKHHX102 Date Extracted:09/16/00
Dilution factor: 0.69 Date Analyzed: 09/21/00
Moisture %:19

QC Batch: 0266391

Client Sample Id: SB32/33-410-O-000915

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	210	U
108-90-7	Chlorobenzene	210	U
100-41-4	Ethylbenzene	210	U
100-42-5	Styrene	210	U
1330-20-7	Xylenes (total)	210	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I160164 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.43 / g Date Received: 09/16/00
Work Order: DKHHX102 Date Extracted:09/16/00
Dilution factor: 0.69 Date Analyzed: 09/21/00
Moisture %:19

QC Batch: 0266391

Client Sample Id: SB32/33-410-O-000915

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

164

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I160164 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.9 / g Date Received: 09/16/00
Work Order: DKHHT102 Date Extracted:09/16/00
Dilution factor: 1.44 Date Analyzed: 09/21/00
Moisture %:23

QC Batch: 0266391

Client Sample Id: SB32/33-413-R-000915

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	930	U
74-83-9	Bromomethane	930	U
75-01-4	Vinyl chloride	930	U
75-00-3	Chloroethane	930	U
75-09-2	Methylene chloride	470	U
67-64-1	**Acetone**	**2000**	**B**
75-15-0	Carbon disulfide	470	U
75-35-4	1,1-Dichloroethene	470	U
75-34-3	1,1-Dichloroethane	470	U
540-59-0	**1,2-Dichloroethene (total)**	**230**	**J**
67-66-3	Chloroform	470	U
107-06-2	1,2-Dichloroethane	470	U
78-93-3	2-Butanone	1900	U
71-55-6	1,1,1-Trichloroethane	470	U
56-23-5	Carbon tetrachloride	470	U
75-27-4	Bromodichloromethane	470	U
78-87-5	1,2-Dichloropropane	470	U
10061-01-5	cis-1,3-Dichloropropene	470	U
79-01-6	**Trichloroethene**	**11000**	
124-48-1	Dibromochloromethane	470	U
79-00-5	1,1,2-Trichloroethane	470	U
71-43-2	Benzene	470	U
10061-02-6	trans-1,3-Dichloropropene	470	U
75-25-2	Bromoform	470	U
108-10-1	4-Methyl-2-pentanone	1900	U
591-78-6	2-Hexanone	1900	U
127-18-4	**Tetrachloroethene**	**660**	
79-34-5	1,1,2,2-Tetrachloroethane	470	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I160164 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.9 / g Date Received: 09/16/00
Work Order: DKHHT102 Date Extracted: 09/16/00
Dilution factor: 1.44 Date Analyzed: 09/21/00
Moisture %: 23

QC Batch: 0266391

Client Sample Id: SB32/33-413-R-000915

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	470	U
108-90-7	Chlorobenzene	470	U
100-41-4	Ethylbenzene	470	U
100-42-5	Styrene	470	U
1330-20-7	Xylenes (total)	470	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I160164 001

Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.9 / g Date Received: 09/16/00

Work Order: DKHHT102 Date Extracted: 09/16/00

Dilution factor: 1.44 Date Analyzed: 09/21/00

Moisture %: 23

QC Batch: 0266391

Client Sample Id: SB32/33-413-R-000915

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I160164 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.71 / g Date Received: 09/16/00
Work Order: DKHJ1102 Date Extracted: 09/16/00
Dilution factor: 1.46 Date Analyzed: 09/21/00
Moisture %: 22

QC Batch: 0266391

Client Sample Id: *FDUP32/33-006-000915*

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	940	U
74-83-9	Bromomethane	940	U
75-01-4	Vinyl chloride	940	U
75-00-3	Chloroethane	940	U
75-09-2	Methylene chloride	470	U
67-64-1	Acetone	1300	J B
75-15-0	Carbon disulfide	470	U
75-35-4	1,1-Dichloroethene	470	U
75-34-3	1,1-Dichloroethane	470	U
540-59-0	1,2-Dichloroethene (total)	240	J
67-66-3	Chloroform	470	U
107-06-2	1,2-Dichloroethane	470	U
78-93-3	2-Butanone	1900	U
71-55-6	1,1,1-Trichloroethane	470	U
56-23-5	Carbon tetrachloride	470	U
75-27-4	Bromodichloromethane	470	U
78-87-5	1,2-Dichloropropane	470	U
10061-01-5	cis-1,3-Dichloropropene	470	U
79-01-6	Trichloroethene	12000	
124-48-1	Dibromochloromethane	470	U
79-00-5	1,1,2-Trichloroethane	470	U
71-43-2	Benzene	470	U
10061-02-6	trans-1,3-Dichloropropene	470	U
75-25-2	Bromoform	470	U
108-10-1	4-Methyl-2-pentanone	1900	U
591-78-6	2-Hexanone	1900	U
127-18-4	Tetrachloroethene	720	
79-34-5	1,1,2,2-Tetrachloroethane	470	U

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RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID: A0I160164 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.71 / g Date Received: 09/16/00
Work Order: DKHJ1102 Date Extracted: 09/16/00
Dilution factor: 1.46 Date Analyzed: 09/21/00
Moisture %: 22

QC Batch: 0266391

Client Sample Id: FDUP32/33-006-000915

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	470	U
108-90-7	Chlorobenzene	470	U
100-41-4	Ethylbenzene	470	U
100-42-5	Styrene	470	U
1330-20-7	Xylenes (total)	470	U

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RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I160164 005

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.71 / g Date Received: 09/16/00

Work Order: DKHJ1102 Date Extracted:09/16/00

Dilution factor: 1.46 Date Analyzed: 09/21/00

Moisture %:22

QC Batch: 0266391

Client Sample Id: FDUP32/33-006-000915

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

170

RMT

Client Sample ID: SB32/33-417-K-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-001 **Work Order #...:** DLHH9102 **Matrix.....:** SO
Date Sampled...: 10/03/00 10:46 **Date Received..:** 10/04/00
Prep Date.....: 10/05/00 **Analysis Date..:** 10/10/00
Prep Batch #...: 0284414
Dilution Factor: 0.69
% Moisture.....: 20 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	430	ug/kg
Bromomethane	ND	430	ug/kg
Vinyl chloride	ND	430	ug/kg
Chloroethane	ND	430	ug/kg
Methylene chloride	ND	220	ug/kg
Acetone	**740 J,B**	**860**	**ug/kg**
Carbon disulfide	ND	220	ug/kg
1,1-Dichloroethene	ND	220	ug/kg
1,1-Dichloroethane	ND	220	ug/kg
1,2-Dichloroethene (total)	ND	220	ug/kg
Chloroform	ND	220	ug/kg
1,2-Dichloroethane	ND	220	ug/kg
2-Butanone	ND	860	ug/kg
1,1,1-Trichloroethane	ND	220	ug/kg
Carbon tetrachloride	ND	220	ug/kg
Bromodichloromethane	ND	220	ug/kg
1,2-Dichloropropane	ND	220	ug/kg
cis-1,3-Dichloropropene	ND	220	ug/kg
Trichloroethene	ND	220	ug/kg
Dibromochloromethane	ND	220	ug/kg
1,1,2-Trichloroethane	ND	220	ug/kg
Benzene	ND	220	ug/kg
trans-1,3-Dichloropropene	ND	220	ug/kg
Bromoform	ND	220	ug/kg
4-Methyl-2-pentanone	ND	860	ug/kg
2-Hexanone	ND	860	ug/kg
Tetrachloroethene	ND	220	ug/kg
1,1,2,2-Tetrachloroethane	ND	220	ug/kg
Toluene	ND	220	ug/kg
Chlorobenzene	ND	220	ug/kg
Ethylbenzene	ND	220	ug/kg
Styrene	ND	220	ug/kg
Xylenes (total)	ND	220	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	74	(59 - 138)
1,2-Dichloroethane-d4	76	(61 - 130)
Toluene-d8	80	(60 - 143)
4-Bromofluorobenzene	79	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-417-K-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-001 Work Order #...: DLHH9102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-417-K-001003

GC/MS Volatiles

Lot-Sample #: A0J040181-001 **Work Order #:** DLHH9102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: SB32/33-417-M-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-002 Work Order #...: DLHHL102 Matrix.....: SO
Date Sampled...: 10/03/00 10:58 Date Received..: 10/04/00
Prep Date.....: 10/05/00 Analysis Date..: 10/10/00
Prep Batch #...: 0284414
Dilution Factor: 0.76
% Moisture.....: 18 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	460	ug/kg
Bromomethane	ND	460	ug/kg
Vinyl chloride	ND	460	ug/kg
Chloroethane	ND	460	ug/kg
Methylene chloride	ND	230	ug/kg
Acetone	780 J,B	920	ug/kg
Carbon disulfide	ND	230	ug/kg
1,1-Dichloroethene	ND	230	ug/kg
1,1-Dichloroethane	ND	230	ug/kg
1,2-Dichloroethene (total)	ND	230	ug/kg
Chloroform	ND	230	ug/kg
1,2-Dichloroethane	ND	230	ug/kg
2-Butanone	ND	920	ug/kg
1,1,1-Trichloroethane	ND	230	ug/kg
Carbon tetrachloride	ND	230	ug/kg
Bromodichloromethane	ND	230	ug/kg
1,2-Dichloropropane	ND	230	ug/kg
cis-1,3-Dichloropropene	ND	230	ug/kg
Trichloroethene	ND	230	ug/kg
Dibromochloromethane	ND	230	ug/kg
1,1,2-Trichloroethane	ND	230	ug/kg
Benzene	ND	230	ug/kg
trans-1,3-Dichloropropene	ND	230	ug/kg
Bromoform	ND	230	ug/kg
4-Methyl-2-pentanone	ND	920	ug/kg
2-Hexanone	ND	920	ug/kg
Tetrachloroethene	ND	230	ug/kg
1,1,2,2-Tetrachloroethane	ND	230	ug/kg
Toluene	ND	230	ug/kg
Chlorobenzene	ND	230	ug/kg
Ethylbenzene	ND	230	ug/kg
Styrene	ND	230	ug/kg
Xylenes (total)	ND	230	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	77	(59 - 138)
1,2-Dichloroethane-d4	79	(61 - 130)
Toluene-d8	84	(60 - 143)
4-Bromofluorobenzene	84	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-417-M-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-002 Work Order #...: DLHHL102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-417-M-001003

GC/MS Volatiles

Lot-Sample #: A0J040181-002 **Work Order #:** DLHHL102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: SB32/33-418-O-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-003 **Work Order #...:** DLHHN102 **Matrix.....:** SO
Date Sampled...: 10/03/00 10:10 **Date Received..:** 10/04/00
Prep Date.....: 10/05/00 **Analysis Date..:** 10/10/00
Prep Batch #...: 0284414
Dilution Factor: 0.68
% Moisture.....: 15 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	400	ug/kg
Bromomethane	ND	400	ug/kg
Vinyl chloride	ND	400	ug/kg
Chloroethane	ND	400	ug/kg
Methylene chloride	ND	200	ug/kg
Acetone	**640 J,B**	**800**	**ug/kg**
Carbon disulfide	ND	200	ug/kg
1,1-Dichloroethene	ND	200	ug/kg
1,1-Dichloroethane	ND	200	ug/kg
1,2-Dichloroethene (total)	**34 J**	**200**	**ug/kg**
Chloroform	ND	200	ug/kg
1,2-Dichloroethane	ND	200	ug/kg
2-Butanone	ND	800	ug/kg
1,1,1-Trichloroethane	ND	200	ug/kg
Carbon tetrachloride	ND	200	ug/kg
Bromodichloromethane	ND	200	ug/kg
1,2-Dichloropropane	ND	200	ug/kg
cis-1,3-Dichloropropene	ND	200	ug/kg
Trichloroethene	**460**	**200**	**ug/kg**
Dibromochloromethane	ND	200	ug/kg
1,1,2-Trichloroethane	ND	200	ug/kg
Benzene	ND	200	ug/kg
trans-1,3-Dichloropropene	ND	200	ug/kg
Bromoform	ND	200	ug/kg
4-Methyl-2-pentanone	ND	800	ug/kg
2-Hexanone	ND	800	ug/kg
Tetrachloroethene	ND	200	ug/kg
1,1,2,2-Tetrachloroethane	ND	200	ug/kg
Toluene	ND	200	ug/kg
Chlorobenzene	ND	200	ug/kg
Ethylbenzene	ND	200	ug/kg
Styrene	ND	200	ug/kg
Xylenes (total)	ND	200	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	77	(59 - 138)
1,2-Dichloroethane-d4	77	(61 - 130)
Toluene-d8	82	(60 - 143)
4-Bromofluorobenzene	83	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-418-O-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-003 Work Order #...: DLHHN102 Matrix.....: SO

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-418-O-001003

GC/MS Volatiles

Lot-Sample #: A0J040181-003 **Work Order #:** DLHHN102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: SB32/33-419-S-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-005 Work Order #...: DLFFR102 Matrix.....: SO
Date Sampled...: 10/02/00 13:57 Date Received..: 10/03/00
Prep Date.....: 10/04/00 Analysis Date..: 10/10/00
Prep Batch #...: 0283651
Dilution Factor: 0.69
% Moisture.....: 18 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	420	ug/kg
Bromomethane	ND	420	ug/kg
Vinyl chloride	ND	420	ug/kg
Chloroethane	ND	420	ug/kg
Methylene chloride	ND	210	ug/kg
Acetone	780 J,B	840	ug/kg
Carbon disulfide	ND	210	ug/kg
1,1-Dichloroethene	ND	210	ug/kg
1,1-Dichloroethane	ND	210	ug/kg
1,2-Dichloroethene (total)	ND	210	ug/kg
Chloroform	ND	210	ug/kg
1,2-Dichloroethane	ND	210	ug/kg
2-Butanone	ND	840	ug/kg
1,1,1-Trichloroethane	ND	210	ug/kg
Carbon tetrachloride	ND	210	ug/kg
Bromodichloromethane	ND	210	ug/kg
1,2-Dichloropropane	ND	210	ug/kg
cis-1,3-Dichloropropene	ND	210	ug/kg
Trichloroethene	120 J	210	ug/kg
Dibromochloromethane	ND	210	ug/kg
1,1,2-Trichloroethane	ND	210	ug/kg
Benzene	ND	210	ug/kg
trans-1,3-Dichloropropene	ND	210	ug/kg
Bromoform	ND	210	ug/kg
4-Methyl-2-pentanone	ND	840	ug/kg
2-Hexanone	ND	840	ug/kg
Tetrachloroethene	ND	210	ug/kg
1,1,2,2-Tetrachloroethane	ND	210	ug/kg
Toluene	ND	210	ug/kg
Chlorobenzene	ND	210	ug/kg
Ethylbenzene	ND	210	ug/kg
Styrene	ND	210	ug/kg
Xylenes (total)	ND	210	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	77	(59 - 138)
1,2-Dichloroethane-d4	78	(61 - 130)
Toluene-d8	82	(60 - 143)
4-Bromofluorobenzene	81	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-419-S-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-005 Work Order #...: DLFFR102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-419-S-001002

GC/MS Volatiles

Lot-Sample #: A0J030148-005 **Work Order #:** DLFFR102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: SB32/33-420-L-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-001 **Work Order #...:** DLFEL102 **Matrix.....:** SO
Date Sampled...: 10/02/00 08:40 **Date Received..:** 10/03/00
Prep Date.....: 10/04/00 **Analysis Date..:** 10/10/00
Prep Batch #...: 0283651
Dilution Factor: 0.69
% Moisture.....: 17 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	420	ug/kg
Bromomethane	ND	420	ug/kg
Vinyl chloride	ND	420	ug/kg
Chloroethane	ND	420	ug/kg
Methylene chloride	ND	210	ug/kg
Acetone	**710 J,B**	**840**	**ug/kg**
Carbon disulfide	ND	210	ug/kg
1,1-Dichloroethene	ND	210	ug/kg
1,1-Dichloroethane	ND	210	ug/kg
1,2-Dichloroethene (total)	ND	210	ug/kg
Chloroform	ND	210	ug/kg
1,2-Dichloroethane	ND	210	ug/kg
2-Butanone	ND	840	ug/kg
1,1,1-Trichloroethane	ND	210	ug/kg
Carbon tetrachloride	ND	210	ug/kg
Bromodichloromethane	ND	210	ug/kg
1,2-Dichloropropane	ND	210	ug/kg
cis-1,3-Dichloropropene	ND	210	ug/kg
Trichloroethene	ND	210	ug/kg
Dibromochloromethane	ND	210	ug/kg
1,1,2-Trichloroethane	ND	210	ug/kg
Benzene	ND	210	ug/kg
trans-1,3-Dichloropropene	ND	210	ug/kg
Bromoform	ND	210	ug/kg
4-Methyl-2-pentanone	ND	840	ug/kg
2-Hexanone	ND	840	ug/kg
Tetrachloroethene	ND	210	ug/kg
1,1,2,2-Tetrachloroethane	ND	210	ug/kg
Toluene	ND	210	ug/kg
Chlorobenzene	ND	210	ug/kg
Ethylbenzene	ND	210	ug/kg
Styrene	ND	210	ug/kg
Xylenes (total)	ND	210	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	74	(59 - 138)
1,2-Dichloroethane-d4	73	(61 - 130)
Toluene-d8	81	(60 - 143)
4-Bromofluorobenzene	81	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-420-L-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-001 Work Order #...: DLFEL102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-420-L-001002

GC/MS Volatiles

Lot-Sample #: A0J030148-001 **Work Order #:** DLFEL102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: SB32/33-420-Q-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-002 Work Order #...: DLFEX102 Matrix.....: SO
Date Sampled...: 10/02/00 09:25 Date Received..: 10/03/00
Prep Date.....: 10/04/00 Analysis Date..: 10/10/00
Prep Batch #...: 0283651
Dilution Factor: 0.68
% Moisture.....: 23 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	440	ug/kg
Bromomethane	ND	440	ug/kg
Vinyl chloride	ND	440	ug/kg
Chloroethane	ND	440	ug/kg
Methylene chloride	ND	220	ug/kg
Acetone	690 J,B	880	ug/kg
Carbon disulfide	ND	220	ug/kg
1,1-Dichloroethene	ND	220	ug/kg
1,1-Dichloroethane	ND	220	ug/kg
1,2-Dichloroethene (total)	63 J	220	ug/kg
Chloroform	ND	220	ug/kg
1,2-Dichloroethane	ND	220	ug/kg
2-Butanone	ND	880	ug/kg
1,1,1-Trichloroethane	ND	220	ug/kg
Carbon tetrachloride	ND	220	ug/kg
Bromodichloromethane	ND	220	ug/kg
1,2-Dichloropropane	ND	220	ug/kg
cis-1,3-Dichloropropene	ND	220	ug/kg
Trichloroethene	530	220	ug/kg
Dibromochloromethane	ND	220	ug/kg
1,1,2-Trichloroethane	ND	220	ug/kg
Benzene	ND	220	ug/kg
trans-1,3-Dichloropropene	ND	220	ug/kg
Bromoform	ND	220	ug/kg
4-Methyl-2-pentanone	ND	880	ug/kg
2-Hexanone	ND	880	ug/kg
Tetrachloroethene	47 J	220	ug/kg
1,1,2,2-Tetrachloroethane	ND	220	ug/kg
Toluene	ND	220	ug/kg
Chlorobenzene	ND	220	ug/kg
Ethylbenzene	ND	220	ug/kg
Styrene	ND	220	ug/kg
Xylenes (total)	ND	220	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	69	(59 - 138)
1,2-Dichloroethane-d4	69	(61 - 130)
Toluene-d8	75	(60 - 143)
4-Bromofluorobenzene	76	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-420-Q-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-002 Work Order #...: DLFEX102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-420-Q-001002

GC/MS Volatiles

Lot-Sample #: A0J030148-002 Work Order #: DLFEX102 Matrix: SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: SB32/33-421-K-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-004 **Work Order #...:** DLHHT102 **Matrix.....:** SO
Date Sampled...: 10/03/00 14:20 **Date Received..:** 10/04/00
Prep Date.....: 10/05/00 **Analysis Date..:** 10/10/00
Prep Batch #...: 0284414
Dilution Factor: 0.69
% Moisture.....: 17 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	420	ug/kg
Bromomethane	ND	420	ug/kg
Vinyl chloride	ND	420	ug/kg
Chloroethane	ND	420	ug/kg
Methylene chloride	ND	210	ug/kg
Acetone	**680 J,B**	**830**	**ug/kg**
Carbon disulfide	ND	210	ug/kg
1,1-Dichloroethene	ND	210	ug/kg
1,1-Dichloroethane	ND	210	ug/kg
1,2-Dichloroethene (total)	ND	210	ug/kg
Chloroform	ND	210	ug/kg
1,2-Dichloroethane	ND	210	ug/kg
2-Butanone	ND	830	ug/kg
1,1,1-Trichloroethane	ND	210	ug/kg
Carbon tetrachloride	ND	210	ug/kg
Bromodichloromethane	ND	210	ug/kg
1,2-Dichloropropane	ND	210	ug/kg
cis-1,3-Dichloropropene	ND	210	ug/kg
Trichloroethene	**110 J**	**210**	**ug/kg**
Dibromochloromethane	ND	210	ug/kg
1,1,2-Trichloroethane	ND	210	ug/kg
Benzene	ND	210	ug/kg
trans-1,3-Dichloropropene	ND	210	ug/kg
Bromoform	ND	210	ug/kg
4-Methyl-2-pentanone	ND	830	ug/kg
2-Hexanone	ND	830	ug/kg
Tetrachloroethene	ND	210	ug/kg
1,1,2,2-Tetrachloroethane	ND	210	ug/kg
Toluene	ND	210	ug/kg
Chlorobenzene	ND	210	ug/kg
Ethylbenzene	ND	210	ug/kg
Styrene	ND	210	ug/kg
Xylenes (total)	ND	210	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	75	(59 - 138)
1,2-Dichloroethane-d4	76	(61 - 130)
Toluene-d8	80	(60 - 143)
4-Bromofluorobenzene	78	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-421-K-001003

GC/MS Volatiles

Lot-Sample #...: A0J040181-004 Work Order #...: DLHHT102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-421-K-001003

GC/MS Volatiles

Lot-Sample #: A0J040181-004 **Work Order #:** DLHHT102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: SB32/33-422-P-001004

GC/MS Volatiles

Lot-Sample #...: A0J050130-001 Work Order #...: DLK39102 Matrix.....: SO
Date Sampled...: 10/04/00 08:19 Date Received..: 10/05/00
Prep Date.....: 10/05/00 Analysis Date..: 10/11/00
Prep Batch #...: 0284414
Dilution Factor: 0.7
% Moisture.....: 25 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	460	ug/kg
Bromomethane	ND	460	ug/kg
Vinyl chloride	ND	460	ug/kg
Chloroethane	ND	460	ug/kg
Methylene chloride	ND	230	ug/kg
Acetone	640 J,B	930	ug/kg
Carbon disulfide	ND	230	ug/kg
1,1-Dichloroethene	ND	230	ug/kg
1,1-Dichloroethane	ND	230	ug/kg
1,2-Dichloroethene (total)	190 J	230	ug/kg
Chloroform	ND	230	ug/kg
1,2-Dichloroethane	ND	230	ug/kg
2-Butanone	ND	930	ug/kg
1,1,1-Trichloroethane	ND	230	ug/kg
Carbon tetrachloride	ND	230	ug/kg
Bromodichloromethane	ND	230	ug/kg
1,2-Dichloropropane	ND	230	ug/kg
cis-1,3-Dichloropropene	ND	230	ug/kg
Trichloroethene	2800	230	ug/kg
Dibromochloromethane	ND	230	ug/kg
1,1,2-Trichloroethane	ND	230	ug/kg
Benzene	ND	230	ug/kg
trans-1,3-Dichloropropene	ND	230	ug/kg
Bromoform	ND	230	ug/kg
4-Methyl-2-pentanone	ND	930	ug/kg
2-Hexanone	ND	930	ug/kg
Tetrachloroethene	ND	230	ug/kg
1,1,2,2-Tetrachloroethane	ND	230	ug/kg
Toluene	ND	230	ug/kg
Chlorobenzene	ND	230	ug/kg
Ethylbenzene	ND	230	ug/kg
Styrene	ND	230	ug/kg
Xylenes (total)	ND	230	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	74	(59 - 138)
1,2-Dichloroethane-d4	73	(61 - 130)
Toluene-d8	76	(60 - 143)
4-Bromofluorobenzene	81	(47 - 158)

(Continued on next page)

RMT

Client Sample ID: SB32/33-422-P-001004

GC/MS Volatiles

Lot-Sample #...: A0J050130-001 Work Order #...: DLK39102 Matrix.....: SO

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

SB32/33-422-P-001004

GC/MS Volatiles

Lot-Sample #: A0J050130-001 Work Order #: DLK39102 Matrix: SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT		RETENTION TIME	UNITS
Benzenamine, N,N-dimethyl-	121-69-7	690 NJ	M	10.831	ug/kg
Naphthalene, 2-ethenyl-	827-54-3	360 NJ	M	14.239	ug/kg
Diphenyl ether	101-84-8	860 NJ	M	14.452	ug/kg

NOTE(S):

M: Result was measured against nearest internal standard assuming a response factor of 1.

RMT

Client Sample ID: SB32/33-423-K-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-003 **Work Order #...:** DLFF8102 **Matrix.....:** SO
Date Sampled...: 10/02/00 08:40 **Date Received..:** 10/03/00
Prep Date.....: 10/04/00 **Analysis Date..:** 10/10/00
Prep Batch #...: 0283651
Dilution Factor: 7.22
% Moisture.....: 18 **Method.....:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	4400	ug/kg
Bromomethane	ND	4400	ug/kg
Vinyl chloride	ND	4400	ug/kg
Chloroethane	ND	4400	ug/kg
Methylene chloride	ND	2200	ug/kg
Acetone	**15000 B**	**8800**	**ug/kg**
Carbon disulfide	ND	2200	ug/kg
1,1-Dichloroethene	ND	2200	ug/kg
1,1-Dichloroethane	ND	2200	ug/kg
1,2-Dichloroethene (total)	**3400**	**2200**	**ug/kg**
Chloroform	ND	2200	ug/kg
1,2-Dichloroethane	ND	2200	ug/kg
2-Butanone	ND	8800	ug/kg
1,1,1-Trichloroethane	ND	2200	ug/kg
Carbon tetrachloride	ND	2200	ug/kg
Bromodichloromethane	ND	2200	ug/kg
1,2-Dichloropropane	ND	2200	ug/kg
cis-1,3-Dichloropropene	ND	2200	ug/kg
Trichloroethene	**49000**	**2200**	**ug/kg**
Dibromochloromethane	ND	2200	ug/kg
1,1,2-Trichloroethane	ND	2200	ug/kg
Benzene	ND	2200	ug/kg
trans-1,3-Dichloropropene	ND	2200	ug/kg
Bromoform	ND	2200	ug/kg
4-Methyl-2-pentanone	**1100 J**	**8800**	**ug/kg**
2-Hexanone	ND	8800	ug/kg
Tetrachloroethene	**480 J**	**2200**	**ug/kg**
1,1,2,2-Tetrachloroethane	ND	2200	ug/kg
Toluene	**430 J**	**2200**	**ug/kg**
Chlorobenzene	ND	2200	ug/kg
Ethylbenzene	ND	2200	ug/kg
Styrene	ND	2200	ug/kg
Xylenes (total)	ND	2200	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	69 DIL	(59 - 138)
1,2-Dichloroethane-d4	69 DIL	(61 - 130)
Toluene-d8	72 DIL	(60 - 143)
4-Bromofluorobenzene	71 DIL	(47 - 158)

(Continued on next page)

EMT

Client Sample ID: SB32/33-423-K-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-003 Work Order #...: DLFF8102 Matrix.....: SO

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated result. Result is less than RL.

RMT

SB32/33-423-K-001002

GC/MS Volatiles

Lot-Sample #: A0J030148-003 **Work Order #:** DLFF8102 **Matrix:** SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Client Sample ID: FDUP32/33-033-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-007 Work Order #...: DLFG1102 Matrix.....: SO
Date Sampled...: 10/02/00 Date Received..: 10/03/00
Prep Date.....: 10/04/00 Analysis Date..: 10/10/00
Prep Batch #...: 0283651
Dilution Factor: 7.04
% Moisture.....: 17 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	4200	ug/kg
Bromomethane	ND	4200	ug/kg
Vinyl chloride	ND	4200	ug/kg
Chloroethane	ND	4200	ug/kg
Methylene chloride	ND	2100	ug/kg
Acetone	**15000 B**	**8500**	**ug/kg**
Carbon disulfide	ND	2100	ug/kg
1,1-Dichloroethene	ND	2100	ug/kg
1,1-Dichloroethane	ND	2100	ug/kg
1,2-Dichloroethene (total)	**2500**	**2100**	**ug/kg**
Chloroform	ND	2100	ug/kg
1,2-Dichloroethane	ND	2100	ug/kg
2-Butanone	ND	8500	ug/kg
1,1,1-Trichloroethane	ND	2100	ug/kg
Carbon tetrachloride	ND	2100	ug/kg
Bromodichloromethane	ND	2100	ug/kg
1,2-Dichloropropane	ND	2100	ug/kg
cis-1,3-Dichloropropene	ND	2100	ug/kg
Trichloroethene	**40000**	**2100**	**ug/kg**
Dibromochloromethane	ND	2100	ug/kg
1,1,2-Trichloroethane	ND	2100	ug/kg
Benzene	ND	2100	ug/kg
trans-1,3-Dichloropropene	ND	2100	ug/kg
Bromoform	ND	2100	ug/kg
4-Methyl-2-pentanone	**1100 J**	**8500**	**ug/kg**
2-Hexanone	ND	8500	ug/kg
Tetrachloroethene	ND	2100	ug/kg
1,1,2,2-Tetrachloroethane	ND	2100	ug/kg
Toluene	**350 J**	**2100**	**ug/kg**
Chlorobenzene	ND	2100	ug/kg
Ethylbenzene	ND	2100	ug/kg
Styrene	ND	2100	ug/kg
Xylenes (total)	ND	2100	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	71 DIL	(59 - 138)
1,2-Dichloroethane-d4	72 DIL	(61 - 130)
Toluene-d8	75 DIL	(60 - 143)
4-Bromofluorobenzene	71 DIL	(47 - 158)

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(Continued on next page)

RMT

Client Sample ID: FDUP32/33-033-001002

GC/MS Volatiles

Lot-Sample #...: A0J030148-007 Work Order #...: DLFG1102 Matrix.....: SO

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated result. Result is less than RL.

RMT

FDUP32/33-033-001002

GC/MS Volatiles

Lot-Sample #: A0J030148-007 Work Order #: DLFG1102 Matrix: SO

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

PARAMETER	CAS #	ESTIMATED RESULT	RETENTION TIME	UNITS
None				ug/kg

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I210215 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.47 / g Date Received: 09/21/00
Work Order: DKRFV102 Date Extracted:09/22/00
Dilution factor: 0.69 Date Analyzed: 09/27/00
Moisture %:20

QC Batch: 0270539

Client Sample Id: SB32/33-503-D-000920

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	430	U
74-83-9	Bromomethane	430	U
75-01-4	Vinyl chloride	430	U
75-00-3	Chloroethane	430	U
75-09-2	Methylene chloride	88	J B
67-64-1	Acetone	650	J B
75-15-0	Carbon disulfide	210	U
75-35-4	1,1-Dichloroethene	210	U
75-34-3	1,1-Dichloroethane	210	U
540-59-0	1,2-Dichloroethene (total)	210	U
67-66-3	Chloroform	210	U
107-06-2	1,2-Dichloroethane	210	U
78-93-3	2-Butanone	860	U
71-55-6	1,1,1-Trichloroethane	210	U
56-23-5	Carbon tetrachloride	210	U
75-27-4	Bromodichloromethane	210	U
78-87-5	1,2-Dichloropropane	210	U
10061-01-5	cis-1,3-Dichloropropene	210	U
79-01-6	Trichloroethene	210	U
124-48-1	Dibromochloromethane	210	U
79-00-5	1,1,2-Trichloroethane	210	U
71-43-2	Benzene	210	U
10061-02-6	trans-1,3-Dichloropropene	210	U
75-25-2	Bromoform	210	U
108-10-1	4-Methyl-2-pentanone	860	U
591-78-6	2-Hexanone	860	U
127-18-4	Tetrachloroethene	210	U
79-34-5	1,1,2,2-Tetrachloroethane	210	U

201

FORM I

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I210215 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.47 / g Date Received: 09/21/00
Work Order: DKRFV102 Date Extracted:09/22/00
Dilution factor: 0.69 Date Analyzed: 09/27/00
Moisture %:20

QC Batch: 0270539

Client Sample Id: SB32/33-503-D-000920

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	210	U
108-90-7	Chlorobenzene	210	U
100-41-4	Ethylbenzene	210	U
100-42-5	Styrene	210	U
1330-20-7	Xylenes (total)	210	U

202

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I210215 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.47 / g Date Received: 09/21/00
Work Order: DKRFV102 Date Extracted:09/22/00
Dilution factor: 0.69 Date Analyzed: 09/27/00
Moisture %:20

QC Batch: 0270539

Client Sample Id: SB32/33-503-D-000920

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

203

FORM I - TIC

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I210215 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 11.04 / g Date Received: 09/21/00
Work Order: DKRFQ102 Date Extracted:09/22/00
Dilution factor: 0.91 Date Analyzed: 09/28/00
Moisture %:11

QC Batch: 0270539

Client Sample Id: SB32/33-504-B-000920

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	510	U
74-83-9	Bromomethane	510	U
75-01-4	Vinyl chloride	510	U
75-00-3	Chloroethane	510	U
75-09-2	Methylene chloride	110	J B
67-64-1	Acetone	1200	B
75-15-0	Carbon disulfide	260	U
75-35-4	1,1-Dichloroethene	260	U
75-34-3	1,1-Dichloroethane	260	U
540-59-0	1,2-Dichloroethene (total)	260	U
67-66-3	Chloroform	260	U
107-06-2	1,2-Dichloroethane	260	U
78-93-3	2-Butanone	1000	U
71-55-6	1,1,1-Trichloroethane	260	U
56-23-5	Carbon tetrachloride	260	U
75-27-4	Bromodichloromethane	260	U
78-87-5	1,2-Dichloropropane	260	U
10061-01-5	cis-1,3-Dichloropropene	260	U
79-01-6	Trichloroethene	260	U
124-48-1	Dibromochloromethane	260	U
79-00-5	1,1,2-Trichloroethane	260	U
71-43-2	Benzene	260	U
10061-02-6	trans-1,3-Dichloropropene	260	U
75-25-2	Bromoform	260	U
108-10-1	4-Methyl-2-pentanone	1000	U
591-78-6	2-Hexanone	1000	U
127-18-4	Tetrachloroethene	260	U
79-34-5	1,1,2,2-Tetrachloroethane	260	U

204

FORM I

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I210215 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 11.04 / g Date Received: 09/21/00
Work Order: DKRPQ102 Date Extracted:09/22/00
Dilution factor: 0.91 Date Analyzed: 09/28/00
Moisture %:11

QC Batch: 0270539

Client Sample Id: SB32/33-504-B-000920

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	260	U
108-90-7	Chlorobenzene	260	U
100-41-4	Ethylbenzene	260	U
100-42-5	Styrene	260	U
1330-20-7	Xylenes (total)	260	U

205

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) SO Lab Sample ID:A0I210215 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 11.04 / g Date Received: 09/21/00
Work Order: DKRFQ102 Date Extracted:09/22/00
Dilution factor: 0.91 Date Analyzed: 09/28/00
Moisture %:11

QC Batch: 0270539

Client Sample Id: SB32/33-504-B-000920

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

206

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J130156 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.8 / g Date Received: 10/13/00
Work Order: DM4D21AC Date Extracted:10/13/00
Dilution factor: 0.72 Date Analyzed: 10/22/00
Moisture %:17

QC Batch: 0298666

Client Sample Id: SB32/33-506-B-001012

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	430	U
74-83-9	Bromomethane	430	U
75-01-4	Vinyl chloride	430	U
75-00-3	Chloroethane	430	U
75-09-2	Methylene chloride	560	
67-64-1	Acetone	1000	B
75-15-0	Carbon disulfide	220	U
75-35-4	1,1-Dichloroethene	220	U
75-34-3	1,1-Dichloroethane	220	U
540-59-0	1,2-Dichloroethene (total)	220	U
67-66-3	Chloroform	220	U
107-06-2	1,2-Dichloroethane	220	U
78-93-3	2-Butanone	870	U
71-55-6	1,1,1-Trichloroethane	220	U
56-23-5	Carbon tetrachloride	220	U
75-27-4	Bromodichloromethane	220	U
78-87-5	1,2-Dichloropropane	220	U
10061-01-5	cis-1,3-Dichloropropene	220	U
79-01-6	Trichloroethene	220	U
124-48-1	Dibromochloromethane	220	U
79-00-5	1,1,2-Trichloroethane	220	U
71-43-2	Benzene	220	U
10061-02-6	trans-1,3-Dichloropropene	220	U
75-25-2	Bromoform	220	U
108-10-1	4-Methyl-2-pentanone	870	U
591-78-6	2-Hexanone	870	U
127-18-4	Tetrachloroethene	220	U
79-34-5	1,1,2,2-Tetrachloroethane	220	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J130156 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.8 / g Date Received: 10/13/00
Work Order: DM4D21AC Date Extracted:10/13/00
Dilution factor: 0.72 Date Analyzed: 10/22/00
Moisture %:17

QC Batch: 0298666

Client Sample Id: SB32/33-506-B-001012

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	220	U
108-90-7	Chlorobenzene	220	U
100-41-4	Ethylbenzene	220	U
100-42-5	Styrene	220	U
1330-20-7	Xylenes (total)	220	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0J13156

Matrix: (soil/water) SO Lab Sample ID: A0J130156 001

Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 13.8 / g Date Received: 10/13/00

Work Order: DM4D21AC Date Extracted: 10/13/00

Dilution factor: 0.72 Date Analyzed: 10/22/00

Moisture %: 17

QC Batch: 0298666

Client Sample Id: SB32/33-506-B-001012

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J130156 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.5 / g Date Received: 10/13/00
Work Order: DM4EC1AC Date Extracted:10/13/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:17

QC Batch: 0298666

Client Sample Id: SB32/33-506-G-001012

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	420	U
74-83-9	Bromomethane	420	U
75-01-4	Vinyl chloride	420	U
75-00-3	Chloroethane	420	U
75-09-2	Methylene chloride	880	
67-64-1	Acetone	890	B
75-15-0	Carbon disulfide	210	U
75-35-4	1,1-Dichloroethene	210	U
75-34-3	1,1-Dichloroethane	210	U
540-59-0	1,2-Dichloroethene (total)	210	U
67-66-3	Chloroform	210	U
107-06-2	1,2-Dichloroethane	210	U
78-93-3	2-Butanone	830	U
71-55-6	1,1,1-Trichloroethane	210	U
56-23-5	Carbon tetrachloride	210	U
75-27-4	Bromodichloromethane	210	U
78-87-5	1,2-Dichloropropane	210	U
10061-01-5	cis-1,3-Dichloropropene	210	U
79-01-6	Trichloroethene	210	U
124-48-1	Dibromochloromethane	210	U
79-00-5	1,1,2-Trichloroethane	210	U
71-43-2	Benzene	210	U
10061-02-6	trans-1,3-Dichloropropene	210	U
75-25-2	Bromoform	210	U
108-10-1	4-Methyl-2-pentanone	830	U
591-78-6	2-Hexanone	830	U
127-18-4	Tetrachloroethene	210	U
79-34-5	1,1,2,2-Tetrachloroethane	210	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J130156 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.5 / g Date Received: 10/13/00
Work Order: DM4EC1AC Date Extracted:10/13/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:17

QC Batch: 0298666

Client Sample Id: SB32/33-506-G-001012

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	210	U
108-90-7	Chlorobenzene	210	U
100-41-4	Ethylbenzene	210	U
100-42-5	Styrene	210	U
1330-20-7	Xylenes (total)	210	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J130156 002

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.5 / g Date Received: 10/13/00

Work Order: DM4EC1AC Date Extracted:10/13/00

Dilution factor: 0.69 Date Analyzed: 10/22/00

Moisture %:17

QC Batch: 0298666

Client Sample Id: SB32/33-506-G-001012

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J130156 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 10/13/00
Work Order: DM4EG1AC Date Extracted:10/13/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:19

QC Batch: 0298666

Client Sample Id: SB32/33-506-L-001012

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	420	U
74-83-9	Bromomethane	420	U
75-01-4	Vinyl chloride	420	U
75-00-3	Chloroethane	420	U
75-09-2	Methylene chloride	840	
67-64-1	Acetone	1000	B
75-15-0	Carbon disulfide	210	U
75-35-4	1,1-Dichloroethene	210	U
75-34-3	1,1-Dichloroethane	210	U
540-59-0	1,2-Dichloroethene (total)	210	U
67-66-3	Chloroform	210	U
107-06-2	1,2-Dichloroethane	210	U
78-93-3	2-Butanone	850	U
71-55-6	1,1,1-Trichloroethane	210	U
56-23-5	Carbon tetrachloride	210	U
75-27-4	Bromodichloromethane	210	U
78-87-5	1,2-Dichloropropane	210	U
10061-01-5	cis-1,3-Dichloropropene	210	U
79-01-6	Trichloroethene	210	U
124-48-1	Dibromochloromethane	210	U
79-00-5	1,1,2-Trichloroethane	210	U
71-43-2	Benzene	210	U
10061-02-6	trans-1,3-Dichloropropene	210	U
75-25-2	Bromoform	210	U
108-10-1	4-Methyl-2-pentanone	850	U
591-78-6	2-Hexanone	850	U
127-18-4	Tetrachloroethene	62	J
79-34-5	1,1,2,2-Tetrachloroethane	210	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J130156 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 10/13/00
Work Order: DM4EG1AC Date Extracted:10/13/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:19

QC Batch: 0298666

Client Sample Id: SB32/33-506-L-001012

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	210	U
108-90-7	Chlorobenzene	210	U
100-41-4	Ethylbenzene	210	U
100-42-5	Styrene	210	U
1330-20-7	Xylenes (total)	210	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0J13156

Matrix: (soil/water) SO Lab Sample ID: A0J130156 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 10/13/00
Work Order: DM4EG1AC Date Extracted: 10/13/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %: 19

QC Batch: 0298666

Client Sample Id: SB32/33-506-L-001012

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J130156 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 10/13/00
Work Order: DM4EH1AC Date Extracted:10/13/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:20

QC Batch: 0298666

Client Sample Id: SB32/33-506-N-001012

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
74-87-3	Chloromethane	430	U
74-83-9	Bromomethane	430	U
75-01-4	Vinyl chloride	430	U
75-00-3	Chloroethane	430	U
75-09-2	Methylene chloride	630	
67-64-1	Acetone	930	B
75-15-0	Carbon disulfide	220	U
75-35-4	1,1-Dichloroethene	220	U
75-34-3	1,1-Dichloroethane	220	U
540-59-0	1,2-Dichloroethene (total)	220	U
67-66-3	Chloroform	220	U
107-06-2	1,2-Dichloroethane	220	U
78-93-3	2-Butanone	860	U
71-55-6	1,1,1-Trichloroethane	220	U
56-23-5	Carbon tetrachloride	220	U
75-27-4	Bromodichloromethane	220	U
78-87-5	1,2-Dichloropropane	220	U
10061-01-5	cis-1,3-Dichloropropene	220	U
79-01-6	Trichloroethene	220	U
124-48-1	Dibromochloromethane	220	U
79-00-5	1,1,2-Trichloroethane	220	U
71-43-2	Benzene	220	U
10061-02-6	trans-1,3-Dichloropropene	220	U
75-25-2	Bromoform	220	U
108-10-1	4-Methyl-2-pentanone	860	U
591-78-6	2-Hexanone	860	U
127-18-4	Tetrachloroethene	220	U
79-34-5	1,1,2,2-Tetrachloroethane	220	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J130156 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 10/13/00
Work Order: DM4EH1AC Date Extracted:10/13/00
Dilution factor: 0.69 Date Analyzed: 10/22/00
Moisture %:20

QC Batch: 0298666

Client Sample Id: SB32/33-506-N-001012

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
108-88-3	Toluene	220	U
108-90-7	Chlorobenzene	220	U
100-41-4	Ethylbenzene	220	U
100-42-5	Styrene	220	U
1330-20-7	Xylenes (total)	220	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) SO Lab Sample ID:A0J130156 004

Method: SW846 8260B

Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 14.4 / g Date Received: 10/13/00

Work Order: DM4EH1AC Date Extracted:10/13/00

Dilution factor: 0.69 Date Analyzed: 10/22/00

Moisture %:20

QC Batch: 0298666

Client Sample Id: SB32/33-506-M-001012

(ug/L or ug/kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WQ Lab Sample ID:A0J020134 003
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 10/02/00
Work Order: DLDRT101 Date Extracted:10/09/00
Dilution factor: 1 Date Analyzed: 10/09/00
Moisture %:

QC Batch: 0284100

Client Sample Id: HOLDBLK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5.0	U
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WQ Lab Sample ID:A0J020134 003
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 10/02/00
Work Order: DLDRT101 Date Extracted:10/09/00
Dilution factor: 1 Date Analyzed: 10/09/00
Moisture %:

QC Batch: 0284100

Client Sample Id: HOLDBLK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	Methylene chloride	2.0	U
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WQ Lab Sample ID: A0J020134 003

Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL
Work Order: DLDRT101
Dilution factor: 1
Moisture %:

Date Received: 10/02/00
Date Extracted: 10/09/00
Date Analyzed: 10/09/00

QC Batch: 0284100

Client Sample Id: HOLDBLK

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
556-67-2	Cyclotetrasiloxane, octameth	21.015	2.1	NJ
	Unknown	23.588	2.1	NJ

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WQ Lab Sample ID: A0I140267 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 25 / mL Date Received: 09/14/00
Work Order: DKDM2101 Date Extracted: 09/15/00
Dilution factor: 1 Date Analyzed: 09/15/00
Moisture %:

QC Batch: 0262229

Client Sample Id: TRIP BLANK-01

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	2.0	U
74-83-9	Bromomethane	2.0	U
75-01-4	Vinyl chloride	2.0	U
75-00-3	Chloroethane	2.0	U
75-09-2	Methylene chloride	1.0	U
67-64-1	Acetone	10	U
75-15-0	Carbon disulfide	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
540-59-0	1,2-Dichloroethene (total)	1.0	U
67-66-3	Chloroform	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
75-27-4	Bromodichloromethane	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
79-01-6	Trichloroethene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
71-43-2	Benzene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-25-2	Bromoform	1.0	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WQ Lab Sample ID: A0I140267 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 25 / mL Date Received: 09/14/00
Work Order: DKDM2101 Date Extracted: 09/15/00
Dilution factor: 1 Date Analyzed: 09/15/00
Moisture %:

QC Batch: 0262229

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-88-3	Toluene	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
100-42-5	Styrene	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WQ Lab Sample ID: A0I160164 006
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 25 / mL Date Received: 09/16/00
Work Order: DKHJ2101 Date Extracted: 09/18/00
Dilution factor: 1 Date Analyzed: 09/18/00
Moisture %:

QC Batch: 0263157

Client Sample Id: TRIP BLANK-02

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	2.0	U
74-83-9	Bromomethane	2.0	U
75-01-4	Vinyl chloride	2.0	U
75-00-3	Chloroethane	2.0	U
75-09-2	Methylene chloride	1.0	U
67-64-1	Acetone	10	U
75-15-0	Carbon disulfide	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
540-59-0	1,2-Dichloroethene (total)	1.0	U
67-66-3	Chloroform	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
75-27-4	Bromodichloromethane	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
79-01-6	Trichloroethene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
71-43-2	Benzene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-25-2	Bromoform	1.0	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WQ Lab Sample ID:A0I160164 006
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 25 / mL Date Received: 09/16/00
Work Order: DKHJ2101 Date Extracted:09/18/00
Dilution factor: 1 Date Analyzed: 09/18/00
Moisture %:

QC Batch: 0263157

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-88-3	Toluene	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
100-42-5	Styrene	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WQ Lab Sample ID: A0I190242 007
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 09/19/00
Work Order: DKLWV101 Date Extracted: 09/22/00
Dilution factor: 1 Date Analyzed: 09/22/00
Moisture %:

QC Batch: 0268105

Client Sample Id: TRIP BLANK-03

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	2.0	U
74-83-9	Bromomethane	2.0	U
75-01-4	Vinyl chloride	2.0	U
75-00-3	Chloroethane	2.0	U
75-09-2	Methylene chloride	1.0	U
67-64-1	Acetone	10	U
75-15-0	Carbon disulfide	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
540-59-0	1,2-Dichloroethene (total)	1.0	U
67-66-3	Chloroform	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
75-27-4	Bromodichloromethane	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
79-01-6	Trichloroethene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
71-43-2	Benzene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-25-2	Bromoform	1.0	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U

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Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WQ Lab Sample ID:A0I190242 007
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 09/19/00
Work Order: DKLWV101 Date Extracted:09/22/00
Dilution factor: 1 Date Analyzed: 09/22/00
Moisture %:

QC Batch: 0268105

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-88-3	Toluene	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
100-42-5	Styrene	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WG Lab Sample ID: A0I210215 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL
Work Order: DERG1101
Dilution factor: 1
Moisture %:

Date Received: 09/21/00
Date Extracted: 09/24/00
Date Analyzed: 09/24/00

QC Batch: 0269235

Client Sample Id: TRIP BLANK C4

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	2.0	U
74-83-9	Bromomethane	2.0	U
75-01-4	Vinyl chloride	2.0	U
75-00-3	Chloroethane	2.0	U
75-09-2	Methylene chloride	1.0	U
67-64-1	Acetone	10	U
75-15-0	Carbon disulfide	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
540-59-0	1,2-Dichloroethene (total)	1.0	U
67-66-3	Chloroform	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
75-27-4	Bromodichloromethane	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
79-01-6	Trichloroethene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
71-43-2	Benzene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-25-2	Bromoform	1.0	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U

228

FORM I

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WG Lab Sample ID:A0I210215 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 09/21/00
Work Order: DKRG1101 Date Extracted:09/24/00
Dilution factor: 1 Date Analyzed: 09/24/00
Moisture %:

QC Batch: 0269235

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-88-3	Toluene	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
100-42-5	Styrene	1.0	U
1330-20-7	Xylenes (total)	1.0	U

229

FORM I

RMT

Client Sample ID: TRIP BLANK-05

GC/MS Volatiles

Lot-Sample #...: A0I290205-004 Work Order #...: DL9KQ101 Matrix.....: WQ
Date Sampled...: 09/28/00 Date Received..: 09/29/00
Prep Date.....: 10/03/00 Analysis Date..: 10/03/00
Prep Batch #...: 0278117
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	2.0	ug/L
Bromomethane	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Chloroethane	ND	2.0	ug/L
Methylene chloride	ND	1.0	ug/L
Acetone	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethene (total)	ND	1.0	ug/L
Chloroform	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
2-Butanone	ND	10	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Benzene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
4-Methyl-2-pentanone	ND	10	ug/L
2-Hexanone	ND	10	ug/L
Tetrachloroethene	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Styrene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	110	(61 - 128)
Toluene-d8	89	(76 - 110)
Dibromofluoromethane	117	(73 - 122)
4-Bromofluorobenzene	90	(74 - 116)

RMT

Client Sample ID: TRIP BLANK -04

GC/MS Volatiles

Lot-Sample #...: A0J020163-004 Work Order #...: DLE6L101 Matrix.....: WQ
Date Sampled...: 09/29/00 Date Received..: 10/02/00
Prep Date.....: 10/06/00 Analysis Date..: 10/06/00
Prep Batch #...: 0283140
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	2.0	ug/L
Bromomethane	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Chloroethane	ND	2.0	ug/L
Methylene chloride	ND	1.0	ug/L
Acetone	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethene (total)	ND	1.0	ug/L
Chloroform	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
2-Butanone	ND	10	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Benzene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
4-Methyl-2-pentanone	ND	10	ug/L
2-Hexanone	ND	10	ug/L
Tetrachloroethene	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Styrene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	109	(61 - 128)
Toluene-d8	87	(76 - 110)
Dibromofluoromethane	113	(73 - 122)
4-Bromofluorobenzene	93	(74 - 116)

EMT

Client Sample ID: TRIP BLANK 27

GC/MS Volatiles

Lot-Sample #...: A0J030148-008 Work Order #...: DLFG6101 Matrix.....: WQ
Date Sampled...: 10/02/00 Date Received..: 10/03/00
Prep Date.....: 10/06/00 Analysis Date..: 10/06/00
Prep Batch #...: 0283140
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	2.0	ug/L
Bromomethane	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Chloroethane	ND	2.0	ug/L
Methylene chloride	ND	1.0	ug/L
Acetone	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethene (total)	ND	1.0	ug/L
Chloroform	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
2-Butanone	ND	10	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Benzene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
4-Methyl-2-pentanone	ND	10	ug/L
2-Hexanone	ND	10	ug/L
Tetrachloroethene	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Styrene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	111	(61 - 128)
Toluene-d8	84	(76 - 110)
Dibromofluoromethane	113	(73 - 122)
4-Bromofluorobenzene	91	(74 - 116)

RMT

Client Sample ID: TRIP BLANK-08

GC/MS Volatiles

Lot-Sample #...: A0J040181-008 Work Order #...: DLHKL101 Matrix.....: WQ
Date Sampled...: 10/03/00 Date Received..: 10/04/00
Prep Date.....: 10/10/00 Analysis Date..: 10/10/00
Prep Batch #...: 0285225
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	2.0	ug/L
Bromomethane	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Chloroethane	ND	2.0	ug/L
Methylene chloride	ND	1.0	ug/L
Acetone	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethene (total)	ND	1.0	ug/L
Chloroform	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
2-Butanone	ND	10	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Benzene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
4-Methyl-2-pentanone	ND	10	ug/L
2-Hexanone	ND	10	ug/L
Tetrachloroethene	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Styrene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	98	(61 - 128)
Toluene-d8	86	(76 - 110)
Dibromofluoromethane	96	(73 - 122)
4-Bromofluorobenzene	96	(74 - 116)

EMT

Client Sample ID: TRIP BLANK

GC/MS Volatiles

Lot-Sample #...: A0J050130-003 Work Order #...: DLK3C101 Matrix.....: WQ
Date Sampled...: 10/04/00 Date Received..: 10/05/00
Prep Date.....: 10/11/00 Analysis Date..: 10/11/00
Prep Batch #...: 0286231
Dilution Factor: 1 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	2.0	ug/L
Bromomethane	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Chloroethane	ND	2.0	ug/L
Methylene chloride	ND	1.0	ug/L
Acetone	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethene (total)	ND	1.0	ug/L
Chloroform	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
2-Butanone	ND	10	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Benzene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
4-Methyl-2-pentanone	ND	10	ug/L
2-Hexanone	ND	10	ug/L
Tetrachloroethene	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Styrene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	95	(61 - 128)
Toluene-d8	86	(76 - 110)
Dibromofluoromethane	95	(73 - 122)
4-Bromofluorobenzene	102	(74 - 116)

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) WQ Lab Sample ID:A0J130156 005
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 10/13/00
Work Order: DM4EK1AA Date Extracted:10/13/00
Dilution factor: 1 Date Analyzed: 10/13/00
Moisture %:

QC Batch: 0290113

Client Sample Id: TRIP BLANK -1D

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	3.7	J
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	0.34	J
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0J13156

Matrix: (soil/water) WQ Lab Sample ID: A0J130156 005
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 10/13/00
Work Order: DM4KK1AA Date Extracted: 10/13/00
Dilution factor: 1 Date Analyzed: 10/13/00
Moisture %:

QC Batch: 0290113

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	Methylene chloride	1.0	J
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0J13156

Matrix: (soil/water) WQ Lab Sample ID: A0J130156 005
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 10/13/00
Work Order: DM4EK1AA Date Extracted: 10/13/00
Dilution factor: 1 Date Analyzed: 10/13/00
Moisture %:

QC Batch: 0290113

Client Sample Id: TRIP BLANK

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
55429-85-1	Benzeneethanamine, N-[(penta	23.587	2.5	NJ

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) WQ Lab Sample ID:A0J180230 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 10/17/00
Work Order: DNCXN1AA Date Extracted:10/24/00
Dilution factor: 1 Date Analyzed: 10/24/00
Moisture %:

QC Batch: 0299166

Client Sample Id: TRIP BLANK-11

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	2.0	U
74-83-9	Bromomethane	2.0	U
75-01-4	Vinyl chloride	2.0	U
75-00-3	Chloroethane	2.0	U
75-09-2	Methylene chloride	1.0	U
67-64-1	Acetone	10	U
75-15-0	Carbon disulfide	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
540-59-0	1,2-Dichloroethene (total)	1.0	U
67-66-3	Chloroform	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
75-27-4	Bromodichloromethane	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
79-01-6	Trichloroethene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
71-43-2	Benzene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-25-2	Bromoform	1.0	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J13156

Matrix: (soil/water) WQ Lab Sample ID:A0J180230 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 10/17/00
Work Order: DNCXN1AA Date Extracted:10/24/00
Dilution factor: 1 Date Analyzed: 10/24/00
Moisture %:

QC Batch: 0299166

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-88-3	Toluene	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
100-42-5	Styrene	1.0	U
1330-20-7	Xylenes (total)	1.0	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0J13156

Matrix: (soil/water) WQ Lab Sample ID: A0J180255 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 10/18/00
Work Order: DWC6D1AA Date Extracted: 10/23/00
Dilution factor: 1 Date Analyzed: 10/23/00
Moisture %:

QC Batch: 0298148

Client Sample Id: TRIP BLANK-12

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-87-3	Chloromethane	2.0	U
74-83-9	Bromomethane	2.0	U
75-01-4	Vinyl chloride	2.0	U
75-00-3	Chloroethane	2.0	U
75-09-2	Methylene chloride	1.0	U
67-64-1	Acetone	10	U
75-15-0	Carbon disulfide	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
540-59-0	1,2-Dichloroethene (total)	1.0	U
67-66-3	Chloroform	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
75-27-4	Bromodichloromethane	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
79-01-6	Trichloroethene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
71-43-2	Benzene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-25-2	Bromoform	1.0	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0J13156

Matrix: (soil/water) WQ Lab Sample ID: A0J180255 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 10/18/00
Work Order: DNC6D1AA Date Extracted: 10/23/00
Dilution factor: 1 Date Analyzed: 10/23/00
Moisture %:

QC Batch: 0298148

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-88-3	Toluene	1.0	U
108-90-7	Chlorobenzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
100-42-5	Styrene	1.0	U
1330-20-7	Xylenes (total)	1.0	U

Appendix H
Comparison of the On-Site and Off-Site Laboratory Soil Data

Comparison of the On-Site and Off-Site Laboratory Soil Data

On-site mobile laboratory analyses of approximately 380 soil samples were performed for VOCs to guide the sampling program by providing real-time information. Over 50 samples were then selected for comparative analysis by the approved off-site laboratory, to establish a relationship between the on-site and off-site laboratory results. All analyses were performed in accordance with the methods presented in the USEPA-approved QAPP.

Method 5035 was used for sample collection and methanol preservation. The preserved samples were analyzed on-site by gas chromatographic analysis using GC/FID with direct injection and GC/ELCD and GC/PID (gas chromatograph/flame ionization/electrolytic conductivity and photoionization detectors) with purge and trap. VOC analysis in the off-site laboratory was accomplished using GC/MS (gas chromatography/mass spectrometry) (Method 8260B) in conjunction with Method 5035.

The confidence with which the field data can be used to delineate soil VOC contamination was assessed. To accomplish this, the comparability of the on-site versus off-site laboratory analytical data was evaluated using regression analysis of the detections of three major VOCs: cis-1,2-dichloroethene (DCE); trichloroethene (TCE); and tetrachloroethene (PCE). For the statistical analysis, one half of the reporting limit for the pertinent analysis was used in place of the nondetected value if only one of the pairs had a detection. One data point for TCE was excluded from the data as an outlier. For the comparison purposes, the values for both on-site and off-site analyses represent wet-weight concentrations.

The attached figures present the regression analysis results. The coefficient of determination, r^2, for the relationship between the on-site mobile laboratory cis-1,2-DCE results and the off-site laboratory's 1,2-DCE results is 0.706 (slope = 1.025, intercept 0.3721, n = 22).

The coefficient of determination, r^2, for the relationship between the on-site mobile laboratory TCE results and the off-site laboratory TCE results is 0.906 (slope = 1.268, intercept 0.0442, n = 26).

The coefficient of determination, r^2, for the relationship between the on-site mobile laboratory PCE results and the off-site PCE laboratory results is 0.997 (slope = 1.134, intercept 0.2603, n = 11).

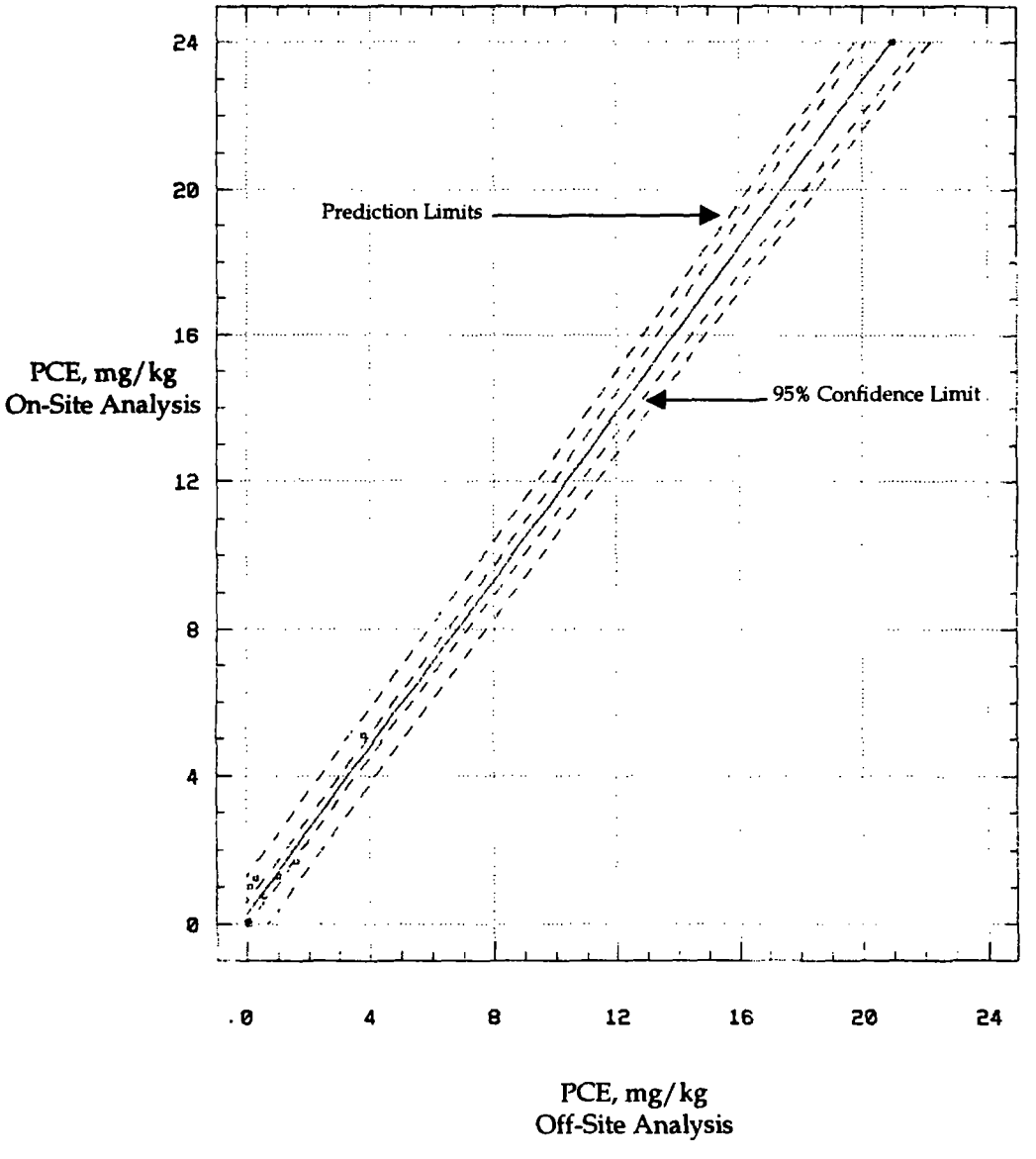
The 95 percent confidence limits for VOC data shown on the figures represent the analytical uncertainty between the two analytical techniques as well as the heterogeneity of the field samples. The figures also present the prediction limits with 95 percent confidence.

The comparison reveals that the general agreement between the on-site mobile laboratory and conventional laboratory methods is very good, and the on-site laboratory results reasonably predict the off-site laboratory results. It is reasonable to expect differences in the results because of the different analytical methods used in the mobile and fixed-based laboratories. Differences between the on-site/off-site results are also due to the lack of sample homogeneity and the difficulty in collecting two samples from exactly the same micro-location. It is likely that much of the difference is due to actual differences in concentration, rather than the analytical laboratory doing the analysis.

As expected, individual sample measurements performed by each laboratory also exhibit variability due to variations introduced during sample handling, preparation, and analysis. The data validation report (Appendix U) discusses the precision and accuracy for the ECCS and STL data.

In conclusion, the comparison of the on-site and off-site laboratory data indicates that the on-site analyses of VOCs were successful and accurate in delineating the extent of contamination in soil, bracketing highly contaminated areas, guiding additional sampling, and selecting samples for off-site laboratory analysis.

Comparison of Soil PCE Concentrations
in the On-Site and Off-Site Laboratory Analyses



Regression Analysis - Linear model: Y = a+bX

Dependent variable: COREGRES.pce_on Independent variable: COREGRES.pce_off

Parameter	Estimate	Standard Error	T Value	Prob. Level
Intercept	0.260252	0.142727	1.82342	0.10155
Slope	1.13366	0.0220854	51.3305	0.00000

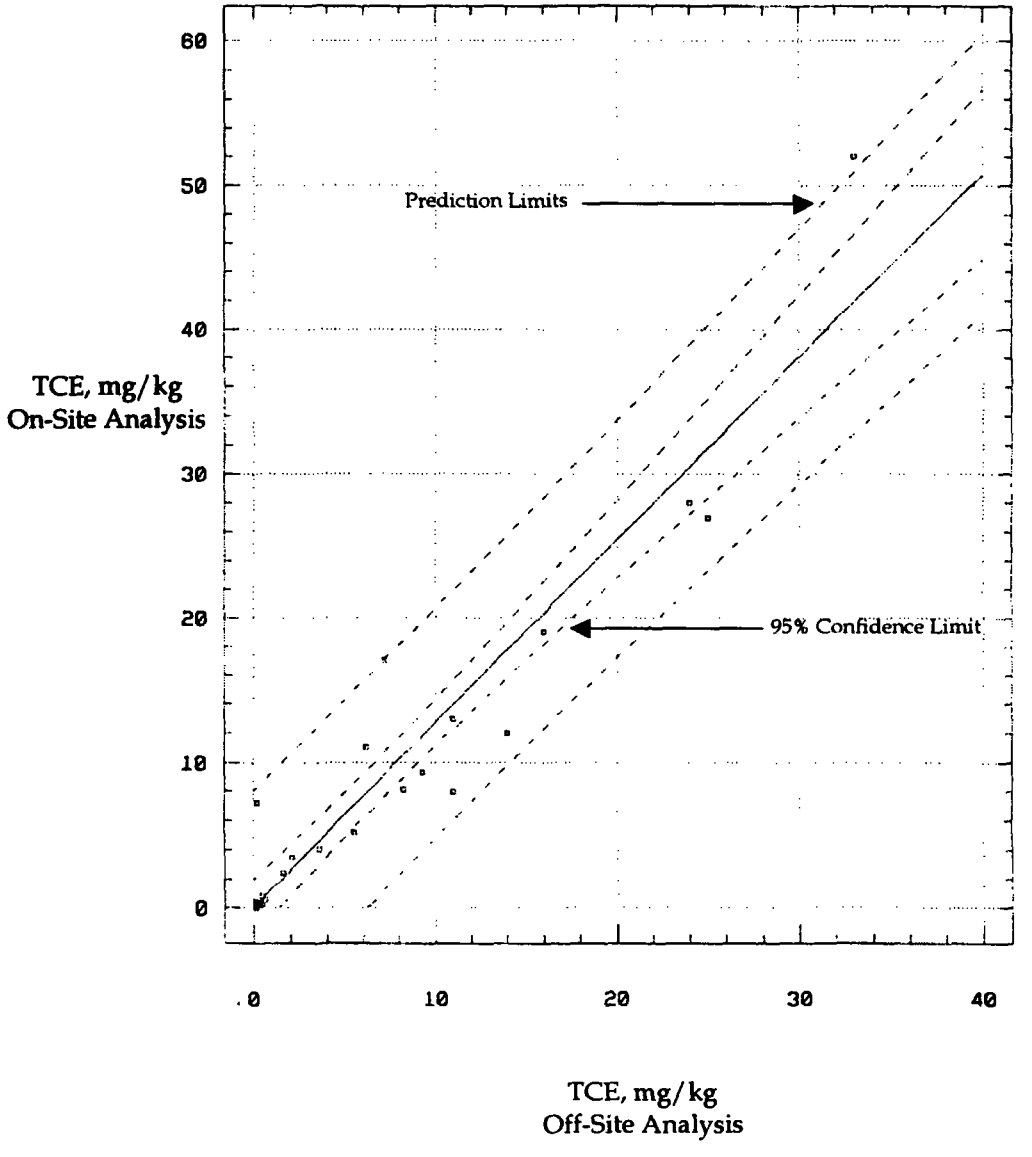
Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	Prob. Level
Model	494.6150	1	494.6150	2634.825	0.00000
Residual	1.6894993	9	0.1877221		
Total (Corr.)	496.30450	10			

Correlation Coefficient = 0.998296 R-squared = 99.66 percent

Stnd. Error of Est. = 0.433269

Comparison of Soil TCE Concentrations
in the On-Site and Off-Site Laboratory Analyses



Regression Analysis - Linear model: Y = a+bX

Dependent variable: COREGTCE.tce_on Independent variable: COREGTCE.tce_off

Parameter	Estimate	Standard Error	T Value	Prob. Level
Intercept	0.0441961	0.936973	0.047169	0.96277
Slope	1.26812	0.0834328	15.1993	0.00000

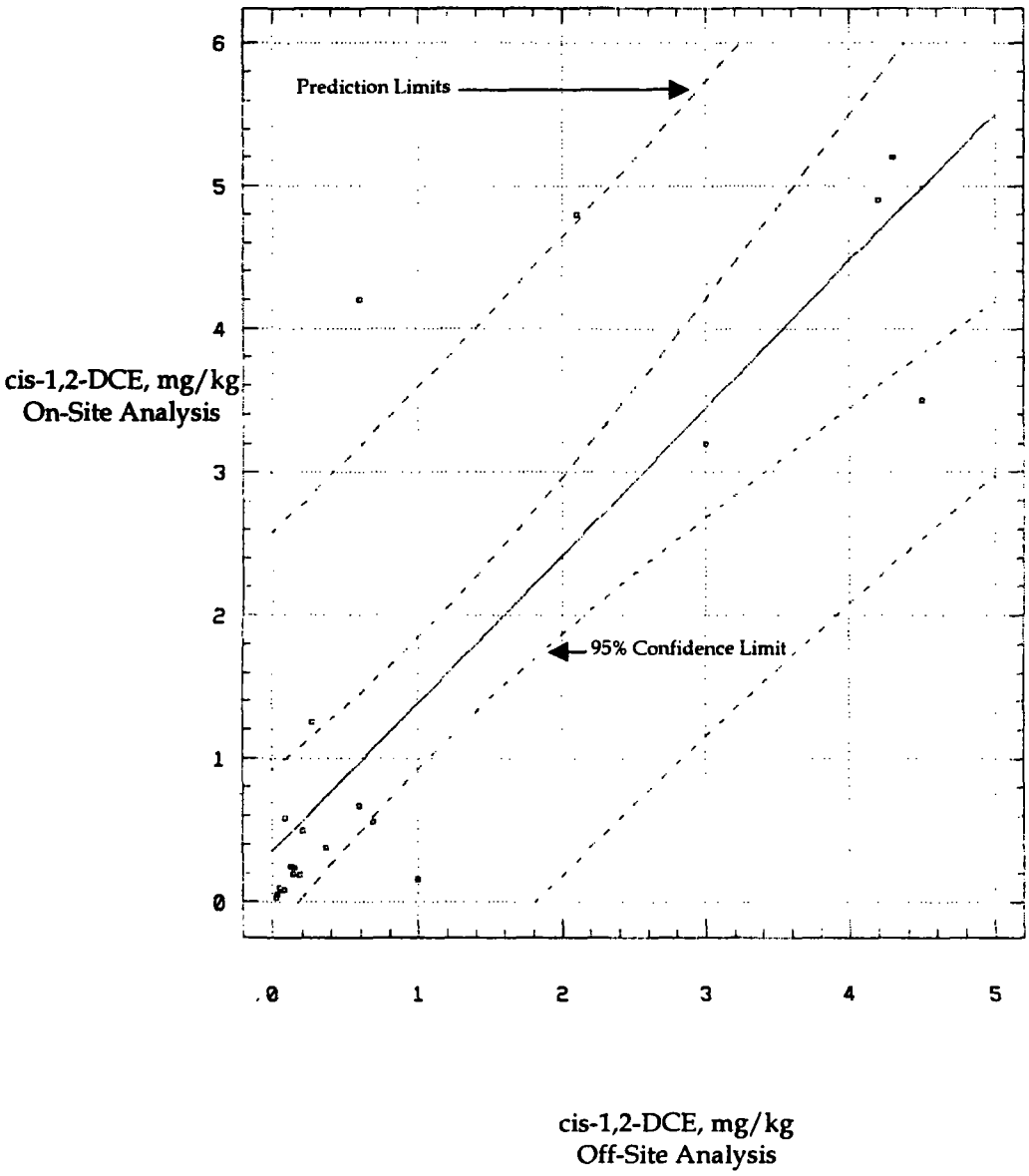
Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	Prob. Level
Model	3261.6522	1	3261.6522	231.017	0.00000
Residual	338.84763	24	14.11865		
Total (Corr.)	3600.4998	25			

Correlation Coefficient = 0.951782 R-squared = 90.59 percent

Stnd. Error of Est. = 3.75748

Comparison of Soil cis-1,2-DCE Concentrations
in the On-Site and Off-Site Laboratory Analyses



Regression Analysis - Linear model: Y = a+bX

Dependent variable: COREGRES.dce_on Independent variable: COREGRES.dce_off

Parameter	Estimate	Standard Error	T Value	Prob. Level
Intercept	0.35238	0.269314	1.30844	0.20556
Slope	1.03043	0.148508	6.93857	0.00000

Analysis of Variance

Source	Sum of Squares	Df	Mean Square	F-Ratio	Prob. Level
Model	51.599464	1	51.599464	48.14369	0.00000
Residual	21.435608	20	1.071780		
Total (Corr.)	73.035072	21			

Correlation Coefficient = 0.840537 R-squared = 70.65 percent

Stnd. Error of Est. = 1.03527

Appendix I
Off-Site Laboratory Groundwater Analytical Reports

Sample Identification

SEVERN
TRENT
SERVICES

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720-6961

Tel: 330 497 9396
Fax: 330 497 0772
www.stl-inc.com

ANALYTICAL REPORT

Fees RMT
[illegible]
Invoice rec'd & closed

SDG #: 0K01212

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

November 30, 2000

5

CASE NARRATIVE

SDG 0K01212

The following report contains the analytical results for eighteen water samples submitted to STL North Canton by RMT from the CONWR site. The samples were received on November 1 and 2, 2000, according to documented sample acceptance procedures.

Dissolved Gas analyses were performed at STL's Austin, Texas facility.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SAMPLE SUMMARY

AOK010212

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DN61G	001	MW33-044-001031	10/31/00	13:15
DN61N	002	MW33-045-001031	10/31/00	14:15
DN61P	003	FDUP33-002-001031	10/31/00	
DN61R	004	MW33-024-103100	10/31/00	10:30
DN610	005	FDUP-33001-103100	10/31/00	
DN611	006	MW33-021-103100	10/31/00	14:00
DN612	007	MW33-007-001031	10/31/00	10:10
DN614	008	MW33-042-103100	10/31/00	16:00
DN617	009	MW33-043-103000	10/30/00	17:10
DN618	010	TRIP BLANK	10/30/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

SAMPLE SUMMARY

A0K020178

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DN8HR	001	MW33-008-001101	11/01/00	14:45
DN9D5	002	MW33-009-001101	11/01/00	14:00
DN9D6	003	MW33-013-001101	11/01/00	10:30
DN9D7	004	MW33-027-001101	11/01/00	14:45
DN9D9	005	MW33-030-001101	11/01/00	09:50
DN9EC	006	MW33-046-001101	11/01/00	15:00
DN9ED	007	MW33-047-001101	11/01/00	17:00
DN9EG	008	MW33-048-001101	11/01/00	16:45
DN9EH	009	MW33-049-001101	11/01/00	14:00
DN9EJ	010	TRIP BLANK	11/01/00	
DN9EK	011	HOLD BLANK	11/01/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

SEVERN
TRENT
SERVICES

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720-6961

Tel: 330 497 9396
Fax: 330 497 0772
www.stl-inc.com

SDG NARRATIVE

This narrative pertains to samples received from the RMT CONWR Site. This data package, completed by STL North Canton, consists of data from the volatile analyses of eighteen (18) water samples and two (2) quality control samples using the OCLP OLC02.1 protocol.

Sample(s) which contain results between the MDL and the RL have been flagged with J. There is the possibility of false positive or misidentification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation will be performed only down to the standard reporting limit (SRL). The acceptance criteria for QC criteria may not be met at these quantitation levels.

Sample(s) which contain concentrations of target analyte(s) at a reportable level in the associated method blank(s) have been flagged with B. All target analytes in the method blank must be below the reporting limits (RL) or the associated sample(s) must be ND with the exception of Methylene chloride, Acetone, and 2-Butanone. These are common laboratory contaminants and may be present in concentrations up to five times the reporting limits.

The following is a listing of the samples in SDG 0K01212:

Client ID	Laboratory ID	Sample Receipt Date
MW33-044-001031	DN61G	11/01/00
MW33-045-001031	DN61N	11/01/00
FDUP33-002-001031	DN61P	11/01/00
MW33-024-103100	DN61R	11/01/00
FDUP33001-103100	DN610	11/01/00
MW33-021-103100	DN611	11/01/00
MW33-007-001031	DN612	11/01/00
MW33-042-103100	DN614	11/01/00
MW33-043-103000	DN617	11/01/00
TRIP BLANK	DN618	11/01/00

STL North Canton is a part of Severn Trent Laboratories, Inc.

SDG NARRATIVE (continued)

Client ID	Laboratory ID	Sample Receipt Date
MW33-008-001101	DN8HR	11/02/00
MW33-009-001101	DN9D5	11/02/00
MW33-013-001101	DN9D6	11/02/00
MW33-027-001101	DN9D7	11/02/00
MW33-030-001101	DN9D9	11/02/00
MW33-046-001101	DN9EC	11/02/00
MW33-047-001101	DN9ED	11/02/00
MW33-048-001101	DN9EG	11/02/00
MW33-049-001101	DN9EH	11/02/00
TRIP BLANK	DN9EJ	11/02/00

There were no anomalies encountered during the preparation and anlyses of these

Kenneth J. Kuzior
Project Manager
November 30, 2000

SEVERN
TRENT
SERVICES

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720-6961

Tel: 330 497 9396
Fax: 330 497 0772
www.stl-inc.com

ANALYTICAL REPORT

REC'D RMT 10-26-00

CONWR

Lot #: A0J130275

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

October 24, 2000

11

CASE NARRATIVE
A0J130275

The following report contains the analytical results for one water sample submitted to STL North Canton by RMT from the CONWR site. The sample was received on October 13, 2000, according to documented sample acceptance procedures.

STL utilizes USEPA approved methods in all analytical work. The sample presented in this report was analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Jack Anderson on October 18, 2000.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

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SAMPLE SUMMARY

A0J130275

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DM5H2	001	32/33-MPE-US-I-1-23	10/12/00	17:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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North Canton, OH 44720-6961

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ANALYTICAL REPORT

REC'D RMT 11-3-00

CONWR

Lot #: A0J130271

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

November 1, 2000

15

CASE NARRATIVE
A0J130271

The following report contains the analytical results for one water sample submitted to STL North Canton by RMT from the CONWR site. The sample was received on October 13, 2000, according to documented sample acceptance procedures.

STL utilizes USEPA approved methods in all analytical work. The sample presented in this report was analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Jack Anderson on October 17, 2000.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) that contained concentrations of target analyte(s) at a reportable level in the associated Method Blank(s) were flagged with "B". All target analytes in the Method Blank must be below the reporting limit (RL) or the associated sample(s) must be ND with the exception of common laboratory contaminants.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

SAMPLE SUMMARY

A0J130271

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DM5GR	001	32/33-MPE-US-I-1-23	10/12/00	17:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

inv - ok

SEVERN TRENT SERVICES

STL North Canton
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North Canton, OH 44720-6961

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Fax: 330 497 0772
www.stl-inc.com

ANALYTICAL REPORT

CONWR

Lot #: A0J040220

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

October 16, 2000

19

CASE NARRATIVE
A0J040220

The following report contains the analytical results for one water sample submitted to STL North Canton by RMT from the CONWR site. The sample was received on October 4, 2000, according to documented sample acceptance procedures.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. Preliminary results were provided by electronic mail to Eric Gredell on October 9, 2000. A summary of QC data for these analyses is included at the rear of the report.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) that contained concentrations of target analyte(s) at a reportable level in the associated Method Blank(s) were flagged with "B". All target analytes in the Method Blank must be below the reporting limit (RL) or the associated sample(s) must be ND with the exception of common laboratory contaminants.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

METALS

Serial dilution of a sample in this lot indicates that physical and chemical interferences were present. Refer to the sample report pages for the affected analytes.

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SAMPLE SUMMARY

A0J040220

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DLHTW	001	WW32/33-004-001003	10/03/00	17:10

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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Volatile Organics Data Sheets

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 007
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6121AA Date Extracted:11/09/00
Dilution factor: 3125 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-007-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	16000	U
71-43-2	**Benzene**	**1100**	**J**
74-97-5	Bromochloromethane	3100	U
75-27-4	Bromodichloromethane	3100	U
75-25-2	Bromoform	3100	U
74-83-9	Bromomethane	3100	U
78-93-3	2-Butanone	16000	U
75-15-0	Carbon disulfide	3100	U
56-23-5	Carbon tetrachloride	3100	U
108-90-7	**Chlorobenzene**	**18000**	
124-48-1	Dibromochloromethane	3100	U
96-12-8	1,2-Dibromo-3-chloropropane	6200	U
75-00-3	Chloroethane	3100	U
67-66-3	Chloroform	3100	U
74-87-3	Chloromethane	3100	U
106-93-4	1,2-Dibromoethane	3100	U
95-50-1	1,2-Dichlorobenzene	3100	U
541-73-1	1,3-Dichlorobenzene	3100	U
106-46-7	1,4-Dichlorobenzene	3100	U
75-34-3	1,1-Dichloroethane	3100	U
107-06-2	1,2-Dichloroethane	3100	U
75-35-4	1,1-Dichloroethene	3100	U
156-59-2	**cis-1,2-Dichloroethene**	**9800**	
156-60-5	trans-1,2-Dichloroethene	3100	U
78-87-5	1,2-Dichloropropane	3100	U
10061-01-5	cis-1,3-Dichloropropene	3100	U
10061-02-6	trans-1,3-Dichloropropene	3100	U
100-41-4	Ethylbenzene	3100	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 007
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6121AA Date Extracted:11/09/00
Dilution factor: 3125 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-007-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	16000	U
75-09-2	Methylene chloride	6200	U
108-10-1	4-Methyl-2-pentanone	3100	U
100-42-5	Styrene	3100	U
79-34-5	1,1,2,2-Tetrachloroethane	3100	U
127-18-4	Tetrachloroethene	3100	U
108-88-3	Toluene	3100	U
71-55-6	1,1,1-Trichloroethane	3100	U
79-00-5	1,1,2-Trichloroethane	3100	U
79-01-6	Trichloroethene	52000	
75-01-4	Vinyl chloride	3100	U
1330-20-7	Xylenes (total)	3100	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 007
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6121AA Date Extracted:11/09/00
Dilution factor: 3125 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-007-001031

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 005
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6101AA Date Extracted:11/09/00
Dilution factor: 5000 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: FDUP-33001-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	25000	U
71-43-2	Benzene	1100	J
74-97-5	Bromochloromethane	5000	U
75-27-4	Bromodichloromethane	5000	U
75-25-2	Bromoform	5000	U
74-83-9	Bromomethane	5000	U
78-93-3	2-Butanone	25000	U
75-15-0	Carbon disulfide	5000	U
56-23-5	Carbon tetrachloride	5000	U
108-90-7	Chlorobenzene	19000	
124-48-1	Dibromochloromethane	5000	U
96-12-8	1,2-Dibromo-3-chloropropane	10000	U
75-00-3	Chloroethane	5000	U
67-66-3	Chloroform	5000	U
74-87-3	Chloromethane	5000	U
106-93-4	1,2-Dibromoethane	5000	U
95-50-1	1,2-Dichlorobenzene	5000	U
541-73-1	1,3-Dichlorobenzene	5000	U
106-46-7	1,4-Dichlorobenzene	5000	U
75-34-3	1,1-Dichloroethane	5000	U
107-06-2	1,2-Dichloroethane	5000	U
75-35-4	1,1-Dichloroethene	5000	U
156-59-2	cis-1,2-Dichloroethene	10000	
156-60-5	trans-1,2-Dichloroethene	5000	U
78-87-5	1,2-Dichloropropane	5000	U
10061-01-5	cis-1,3-Dichloropropene	5000	U
10061-02-6	trans-1,3-Dichloropropene	5000	U
100-41-4	Ethylbenzene	5000	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 005
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6101AA Date Extracted:11/09/00
Dilution factor: 5000 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: FDUP-33001-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	25000	U
75-09-2	Methylene chloride	10000	U
108-10-1	4-Methyl-2-pentanone	5000	U
100-42-5	Styrene	5000	U
79-34-5	1,1,2,2-Tetrachloroethane	5000	U
127-18-4	Tetrachloroethene	5000	U
108-88-3	Toluene	5000	U
71-55-6	1,1,1-Trichloroethane	5000	U
79-00-5	1,1,2-Trichloroethane	5000	U
79-01-6	**Trichloroethene**	**57000**	
75-01-4	Vinyl chloride	5000	U
1330-20-7	Xylenes (total)	5000	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 005
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6101AA Date Extracted:11/09/00
Dilution factor: 5000 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: FDUP-33001-103100

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 001
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN8HR1AA Date Extracted:11/09/00
Dilution factor: 100 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-008-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	500	U
71-43-2	Benzene	100	U
74-97-5	Bromochloromethane	100	U
75-27-4	Bromodichloromethane	100	U
75-25-2	Bromoform	100	U
74-83-9	Bromomethane	100	U
78-93-3	2-Butanone	500	U
75-15-0	Carbon disulfide	100	U
56-23-5	Carbon tetrachloride	100	U
108-90-7	Chlorobenzene	100	U
124-48-1	Dibromochloromethane	100	U
96-12-8	1,2-Dibromo-3-chloropropane	200	U
75-00-3	Chloroethane	100	U
67-66-3	Chloroform	100	U
74-87-3	Chloromethane	100	U
106-93-4	1,2-Dibromoethane	100	U
95-50-1	1,2-Dichlorobenzene	100	U
541-73-1	1,3-Dichlorobenzene	100	U
106-46-7	1,4-Dichlorobenzene	100	U
75-34-3	1,1-Dichloroethane	100	U
107-06-2	1,2-Dichloroethane	100	U
75-35-4	1,1-Dichloroethene	100	U
156-59-2	**cis-1,2-Dichloroethene**	**1300**	
156-60-5	trans-1,2-Dichloroethene	100	U
78-87-5	1,2-Dichloropropane	100	U
10061-01-5	cis-1,3-Dichloropropene	100	U
10061-02-6	trans-1,3-Dichloropropene	100	U
100-41-4	Ethylbenzene	100	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 001
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN8HR1AA Date Extracted:11/09/00
Dilution factor: 100 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-008-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	500	U
75-09-2	Methylene chloride	200	U
108-10-1	4-Methyl-2-pentanone	100	U
100-42-5	Styrene	100	U
79-34-5	1,1,2,2-Tetrachloroethane	100	U
127-18-4	Tetrachloroethene	100	U
108-88-3	Toluene	100	U
71-55-6	1,1,1-Trichloroethane	100	U
79-00-5	1,1,2-Trichloroethane	100	U
79-01-6	Trichloroethene	1200	
75-01-4	Vinyl chloride	100	U
1330-20-7	Xylenes (total)	100	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 001
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN8HR1AA Date Extracted:11/09/00
Dilution factor: 100 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-008-001101

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 002
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D51AA Date Extracted:11/10/00
Dilution factor: 1666.67 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-009-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	8300	U
71-43-2	Benzene	1700	U
74-97-5	Bromochloromethane	1700	U
75-27-4	Bromodichloromethane	1700	U
75-25-2	Bromoform	1700	U
74-83-9	Bromomethane	1700	U
78-93-3	2-Butanone	8300	U
75-15-0	Carbon disulfide	1700	U
56-23-5	Carbon tetrachloride	1700	U
108-90-7	Chlorobenzene	1700	U
124-48-1	Dibromochloromethane	1700	U
96-12-8	1,2-Dibromo-3-chloropropane	3300	U
75-00-3	Chloroethane	1700	U
67-66-3	Chloroform	1700	U
74-87-3	Chloromethane	1700	U
106-93-4	1,2-Dibromoethane	1700	U
95-50-1	1,2-Dichlorobenzene	1700	U
541-73-1	1,3-Dichlorobenzene	1700	U
106-46-7	1,4-Dichlorobenzene	1700	U
75-34-3	1,1-Dichloroethane	1700	U
107-06-2	1,2-Dichloroethane	1700	U
75-35-4	1,1-Dichloroethene	1700	U
156-59-2	cis-1,2-Dichloroethene	2200	
156-60-5	trans-1,2-Dichloroethene	1700	U
78-87-5	1,2-Dichloropropane	1700	U
10061-01-5	cis-1,3-Dichloropropene	1700	U
10061-02-6	trans-1,3-Dichloropropene	1700	U
100-41-4	Ethylbenzene	1700	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 002
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D51AA Date Extracted:11/10/00
Dilution factor: 1666.67 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-009-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	8300	U
75-09-2	Methylene chloride	3300	U
108-10-1	4-Methyl-2-pentanone	1700	U
100-42-5	Styrene	1700	U
79-34-5	1,1,2,2-Tetrachloroethane	1700	U
127-18-4	**Tetrachloroethene**	**190**	**J B**
108-88-3	Toluene	1700	U
71-55-6	1,1,1-Trichloroethane	1700	U
79-00-5	1,1,2-Trichloroethane	1700	U
79-01-6	**Trichloroethene**	**24000**	
75-01-4	Vinyl chloride	1700	U
1330-20-7	Xylenes (total)	1700	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 002
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D51AA Date Extracted:11/10/00
Dilution factor: 1666.67 Date Analyzed: 11/10/00
Moisture %:
QC Batch: 0316150

Client Sample Id: MW33-009-001101

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 003
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D61AA Date Extracted:11/10/00
Dilution factor: 1666.66 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-013-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	8300	U
71-43-2	Benzene	1700	U
74-97-5	Bromochloromethane	1700	U
75-27-4	Bromodichloromethane	1700	U
75-25-2	Bromoform	1700	U
74-83-9	Bromomethane	1700	U
78-93-3	2-Butanone	8300	U
75-15-0	Carbon disulfide	1700	U
56-23-5	Carbon tetrachloride	1700	U
108-90-7	Chlorobenzene	1700	U
124-48-1	Dibromochloromethane	1700	U
96-12-8	1,2-Dibromo-3-chloropropane	3300	U
75-00-3	Chloroethane	1700	U
67-66-3	Chloroform	1700	U
74-87-3	Chloromethane	1700	U
106-93-4	1,2-Dibromoethane	1700	U
95-50-1	1,2-Dichlorobenzene	1700	U
541-73-1	1,3-Dichlorobenzene	1700	U
106-46-7	1,4-Dichlorobenzene	1700	U
75-34-3	1,1-Dichloroethane	1700	U
107-06-2	1,2-Dichloroethane	1700	U
75-35-4	1,1-Dichloroethene	1700	U
156-59-2	**cis-1,2-Dichloroethene**	**1900**	
156-60-5	trans-1,2-Dichloroethene	1700	U
78-87-5	1,2-Dichloropropane	1700	U
10061-01-5	cis-1,3-Dichloropropene	1700	U
10061-02-6	trans-1,3-Dichloropropene	1700	U
100-41-4	Ethylbenzene	1700	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 003
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D61AA Date Extracted:11/10/00
Dilution factor: 1666.66 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-013-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	8300	U
75-09-2	Methylene chloride	3300	U
108-10-1	4-Methyl-2-pentanone	1700	U
100-42-5	Styrene	1700	U
79-34-5	1,1,2,2-Tetrachloroethane	1700	U
127-18-4	Tetrachloroethene	1700	U
108-88-3	Toluene	1700	U
71-55-6	1,1,1-Trichloroethane	1700	U
79-00-5	1,1,2-Trichloroethane	1700	U
79-01-6	Trichloroethene	29000	
75-01-4	Vinyl chloride	1700	U
1330-20-7	Xylenes (total)	1700	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 003
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D61AA Date Extracted:11/10/00
Dilution factor: 1666.66 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-013-001101

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 006
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6111AA Date Extracted:11/09/00
Dilution factor: 333.33 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-021-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	1700	U
71-43-2	Benzene	330	U
74-97-5	Bromochloromethane	330	U
75-27-4	Bromodichloromethane	330	U
75-25-2	Bromoform	330	U
74-83-9	Bromomethane	330	U
78-93-3	2-Butanone	1700	U
75-15-0	Carbon disulfide	330	U
56-23-5	Carbon tetrachloride	330	U
108-90-7	Chlorobenzene	380	
124-48-1	Dibromochloromethane	330	U
96-12-8	1,2-Dibromo-3-chloropropane	670	U
75-00-3	Chloroethane	330	U
67-66-3	Chloroform	330	U
74-87-3	Chloromethane	330	U
106-93-4	1,2-Dibromoethane	330	U
95-50-1	1,2-Dichlorobenzene	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
75-34-3	1,1-Dichloroethane	330	U
107-06-2	1,2-Dichloroethane	330	U
75-35-4	1,1-Dichloroethene	330	U
156-59-2	cis-1,2-Dichloroethene	380	
156-60-5	trans-1,2-Dichloroethene	330	U
78-87-5	1,2-Dichloropropane	330	U
10061-01-5	cis-1,3-Dichloropropene	330	U
10061-02-6	trans-1,3-Dichloropropene	330	U
100-41-4	Ethylbenzene	330	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 006
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6111AA Date Extracted:11/09/00
Dilution factor: 333.33 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-021-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	1700	U
75-09-2	Methylene chloride	670	U
108-10-1	4-Methyl-2-pentanone	330	U
100-42-5	Styrene	330	U
79-34-5	1,1,2,2-Tetrachloroethane	330	U
127-18-4	**Tetrachloroethene**	**400**	
108-88-3	Toluene	330	U
71-55-6	1,1,1-Trichloroethane	330	U
79-00-5	1,1,2-Trichloroethane	330	U
79-01-6	**Trichloroethene**	**4200**	
75-01-4	Vinyl chloride	330	U
1330-20-7	Xylenes (total)	330	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 006
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6111AA Date Extracted:11/09/00
Dilution factor: 333.33 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-021-103100

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 004
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61R1AA Date Extracted:11/10/00
Dilution factor: 83.33 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-024-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	420	U
71-43-2	Benzene	83	U
74-97-5	Bromochloromethane	83	U
75-27-4	Bromodichloromethane	83	U
75-25-2	Bromoform	83	U
74-83-9	Bromomethane	83	U
78-93-3	2-Butanone	420	U
75-15-0	Carbon disulfide	83	U
56-23-5	Carbon tetrachloride	83	U
108-90-7	Chlorobenzene	83	U
124-48-1	Dibromochloromethane	83	U
96-12-8	1,2-Dibromo-3-chloropropane	170	U
75-00-3	Chloroethane	83	U
67-66-3	Chloroform	83	U
74-87-3	Chloromethane	83	U
106-93-4	1,2-Dibromoethane	83	U
95-50-1	**1,2-Dichlorobenzene**	**41**	**J**
541-73-1	1,3-Dichlorobenzene	83	U
106-46-7	1,4-Dichlorobenzene	83	U
75-34-3	1,1-Dichloroethane	83	U
107-06-2	1,2-Dichloroethane	83	U
75-35-4	1,1-Dichloroethene	83	U
156-59-2	**cis-1,2-Dichloroethene**	**120**	
156-60-5	trans-1,2-Dichloroethene	83	U
78-87-5	1,2-Dichloropropane	83	U
10061-01-5	cis-1,3-Dichloropropene	83	U
10061-02-6	trans-1,3-Dichloropropene	83	U
100-41-4	Ethylbenzene	83	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 004
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61R1AA Date Extracted:11/10/00
Dilution factor: 83.33 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-024-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	420	U
75-09-2	Methylene chloride	170	U
108-10-1	4-Methyl-2-pentanone	83	U
100-42-5	Styrene	83	U
79-34-5	1,1,2,2-Tetrachloroethane	83	U
127-18-4	Tetrachloroethene	25	J B
108-88-3	Toluene	83	U
71-55-6	1,1,1-Trichloroethane	83	U
79-00-5	1,1,2-Trichloroethane	83	U
79-01-6	Trichloroethene	1100	
75-01-4	Vinyl chloride	83	U
1330-20-7	Xylenes (total)	83	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 004
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61R1AA Date Extracted:11/10/00
Dilution factor: 83.33 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-024-103100

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
76-13-1	Ethane, 1,1,2-trichloro-1,2,	4.1925	22000	NJ

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 004
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D71AA Date Extracted:11/10/00
Dilution factor: 1000 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-027-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5000	U
71-43-2	Benzene	1000	U
74-97-5	Bromochloromethane	1000	U
75-27-4	Bromodichloromethane	1000	U
75-25-2	Bromoform	1000	U
74-83-9	Bromomethane	1000	U
78-93-3	2-Butanone	5000	U
75-15-0	Carbon disulfide	1000	U
56-23-5	Carbon tetrachloride	1000	U
108-90-7	Chlorobenzene	1000	U
124-48-1	Dibromochloromethane	1000	U
96-12-8	1,2-Dibromo-3-chloropropane	2000	U
75-00-3	Chloroethane	1000	U
67-66-3	Chloroform	1000	U
74-87-3	Chloromethane	1000	U
106-93-4	1,2-Dibromoethane	1000	U
95-50-1	1,2-Dichlorobenzene	1000	U
541-73-1	1,3-Dichlorobenzene	1000	U
106-46-7	1,4-Dichlorobenzene	1000	U
75-34-3	1,1-Dichloroethane	1000	U
107-06-2	1,2-Dichloroethane	1000	U
75-35-4	1,1-Dichloroethene	1000	U
156-59-2	cis-1,2-Dichloroethene	1700	
156-60-5	trans-1,2-Dichloroethene	1000	U
78-87-5	1,2-Dichloropropane	1000	U
10061-01-5	cis-1,3-Dichloropropene	1000	U
10061-02-6	trans-1,3-Dichloropropene	1000	U
100-41-4	Ethylbenzene	1000	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 004
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D71AA Date Extracted:11/10/00
Dilution factor: 1000 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-027-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5000	U
75-09-2	Methylene chloride	2000	U
108-10-1	4-Methyl-2-pentanone	1000	U
100-42-5	Styrene	1000	U
79-34-5	1,1,2,2-Tetrachloroethane	1000	U
127-18-4	Tetrachloroethene	1000	U
108-88-3	Toluene	1000	U
71-55-6	1,1,1-Trichloroethane	1000	U
79-00-5	1,1,2-Trichloroethane	1000	U
79-01-6	**Trichloroethene**	**9400**	
75-01-4	Vinyl chloride	1000	U
1330-20-7	Xylenes (total)	1000	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 004
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D71AA Date Extracted:11/10/00
Dilution factor: 1000 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-027-001101

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 005
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D91AA Date Extracted:11/10/00
Dilution factor: 125 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-030-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	620	U
71-43-2	Benzene	120	U
74-97-5	Bromochloromethane	120	U
75-27-4	Bromodichloromethane	120	U
75-25-2	Bromoform	120	U
74-83-9	Bromomethane	120	U
78-93-3	2-Butanone	620	U
75-15-0	Carbon disulfide	120	U
56-23-5	Carbon tetrachloride	120	U
108-90-7	Chlorobenzene	120	U
124-48-1	Dibromochloromethane	120	U
96-12-8	1,2-Dibromo-3-chloropropane	250	U
75-00-3	Chloroethane	120	U
67-66-3	Chloroform	120	U
74-87-3	Chloromethane	120	U
106-93-4	1,2-Dibromoethane	120	U
95-50-1	1,2-Dichlorobenzene	120	U
541-73-1	1,3-Dichlorobenzene	120	U
106-46-7	1,4-Dichlorobenzene	120	U
75-34-3	1,1-Dichloroethane	120	U
107-06-2	1,2-Dichloroethane	120	U
75-35-4	1,1-Dichloroethene	120	U
156-59-2	**cis-1,2-Dichloroethene**	**920**	
156-60-5	**trans-1,2-Dichloroethene**	**35**	**J**
78-87-5	1,2-Dichloropropane	120	U
10061-01-5	cis-1,3-Dichloropropene	120	U
10061-02-6	trans-1,3-Dichloropropene	120	U
100-41-4	Ethylbenzene	120	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 005
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9D91AA Date Extracted:11/10/00
Dilution factor: 125 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-030-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	620	U
75-09-2	Methylene chloride	250	U
108-10-1	4-Methyl-2-pentanone	120	U
100-42-5	Styrene	120	U
79-34-5	1,1,2,2-Tetrachloroethane	120	U
127-18-4	Tetrachloroethene	120	U
108-88-3	Toluene	120	U
71-55-6	1,1,1-Trichloroethane	120	U
79-00-5	1,1,2-Trichloroethane	120	U
79-01-6	Trichloroethene	1900	
75-01-4	Vinyl chloride	120	U
1330-20-7	Xylenes (total)	120	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 005

Method: OCLP OLC02.1

Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00

Work Order: DN9D91AA Date Extracted:11/10/00

Dilution factor: 125 Date Analyzed: 11/10/00

Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-030-001101

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	Unknown	23.176	340	NJ

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01222

Matrix: (soil/water) WG Lab Sample ID:A0K010222 008
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6141AA Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-042-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5.0	U
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 008
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6141AA Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-042-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	**Methylene chloride**	**0.58**	**J**
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	**Trichloroethene**	**0.12**	**J**
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 008
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6141AA Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-042-103100

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 009
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6171AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-043-103000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5.0	U
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 009
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6171AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-043-103000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	Methylene chloride	0.60	J
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U

FORM I

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 009

Method: OCLP OLC02.1

Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00

Work Order: DN6171AA Date Extracted:11/09/00

Dilution factor: 1 Date Analyzed: 11/09/00

Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-043-103000

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 001
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61G1AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-044-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5.0	U
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	0.10	J
74-87-3	Chloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0K01212

Matrix: (soil/water) WG Lab Sample ID: A0K010212 001
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61G1AA Date Extracted: 11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-044-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	**Methylene chloride**	**0.54**	**J**
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	**Trichloroethene**	**0.12**	**J**
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 001
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61G1AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-044-001031

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 002
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61N1AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-045-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5.0	U
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	**Chloroform**	**0.28**	**J**
74-87-3	Chloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 002
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61N1AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-045-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	Methylene chloride	0.44	J
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 002
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61N1AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: MW33-045-001031

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 003
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61P1AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: FDUP33-002-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5.0	U
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	0.40	J
74-87-3	Chloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 003
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN61P1AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: FDUP33-002-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	**Methylene chloride**	**0.88**	**J**
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	**Trichloroethene**	**0.19**	**J**
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 003

Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00

Work Order: DN61P1AA Date Extracted:11/09/00

Dilution factor: 1 Date Analyzed: 11/09/00

Moisture %:

QC Batch: 0315344

Client Sample Id: FDUP33-002-001031

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

FORM I - TIC

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 006
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EC1AA Date Extracted:11/10/00
Dilution factor: 2.5 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-046-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	12	U
71-43-2	Benzene	2.5	U
74-97-5	Bromochloromethane	2.5	U
75-27-4	Bromodichloromethane	2.5	U
75-25-2	Bromoform	2.5	U
74-83-9	Bromomethane	2.5	U
78-93-3	2-Butanone	12	U
75-15-0	Carbon disulfide	2.5	U
56-23-5	**Carbon tetrachloride**	**4.2**	
108-90-7	Chlorobenzene	2.5	U
124-48-1	Dibromochloromethane	2.5	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
75-00-3	Chloroethane	2.5	U
67-66-3	**Chloroform**	**2.3**	**J**
74-87-3	Chloromethane	2.5	U
106-93-4	1,2-Dibromoethane	2.5	U
95-50-1	1,2-Dichlorobenzene	2.5	U
541-73-1	1,3-Dichlorobenzene	2.5	U
106-46-7	1,4-Dichlorobenzene	2.5	U
75-34-3	1,1-Dichloroethane	2.5	U
107-06-2	1,2-Dichloroethane	2.5	U
75-35-4	1,1-Dichloroethene	2.5	U
156-59-2	**cis-1,2-Dichloroethene**	**2.2**	**J**
156-60-5	trans-1,2-Dichloroethene	2.5	U
78-87-5	1,2-Dichloropropane	2.5	U
10061-01-5	cis-1,3-Dichloropropene	2.5	U
10061-02-6	trans-1,3-Dichloropropene	2.5	U
100-41-4	Ethylbenzene	2.5	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 006
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EC1AA Date Extracted:11/10/00
Dilution factor: 2.5 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-046-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	12	U
75-09-2	Methylene chloride	5.0	U
108-10-1	4-Methyl-2-pentanone	2.5	U
100-42-5	Styrene	2.5	U
79-34-5	1,1,2,2-Tetrachloroethane	2.5	U
127-18-4	Tetrachloroethene	18	B
108-88-3	Toluene	2.5	U
71-55-6	1,1,1-Trichloroethane	2.5	U
79-00-5	1,1,2-Trichloroethane	2.5	U
79-01-6	Trichloroethene	19	
75-01-4	Vinyl chloride	0.57	J
1330-20-7	Xylenes (total)	2.5	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 006
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EC1AA Date Extracted:11/10/00
Dilution factor: 2.5 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-046-001101

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 007
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9ED1AA Date Extracted:11/10/00
Dilution factor: 50 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-047-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	250	U
71-43-2	Benzene	50	U
74-97-5	Bromochloromethane	50	U
75-27-4	Bromodichloromethane	50	U
75-25-2	Bromoform	50	U
74-83-9	Bromomethane	50	U
78-93-3	2-Butanone	250	U
75-15-0	Carbon disulfide	50	U
56-23-5	Carbon tetrachloride	120	
108-90-7	Chlorobenzene	50	U
124-48-1	Dibromochloromethane	50	U
96-12-8	1,2-Dibromo-3-chloropropane	100	U
75-00-3	Chloroethane	50	U
67-66-3	Chloroform	89	
74-87-3	Chloromethane	50	U
106-93-4	1,2-Dibromoethane	50	U
95-50-1	1,2-Dichlorobenzene	50	U
541-73-1	1,3-Dichlorobenzene	50	U
106-46-7	1,4-Dichlorobenzene	50	U
75-34-3	1,1-Dichloroethane	50	U
107-06-2	1,2-Dichloroethane	50	U
75-35-4	1,1-Dichloroethene	50	U
156-59-2	cis-1,2-Dichloroethene	18	J
156-60-5	trans-1,2-Dichloroethene	50	U
78-87-5	1,2-Dichloropropane	50	U
10061-01-5	cis-1,3-Dichloropropene	50	U
10061-02-6	trans-1,3-Dichloropropene	50	U
100-41-4	Ethylbenzene	50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 007
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9ED1AA Date Extracted:11/10/00
Dilution factor: 50 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-047-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	250	U
75-09-2	Methylene chloride	100	U
108-10-1	4-Methyl-2-pentanone	50	U
100-42-5	Styrene	50	U
79-34-5	1,1,2,2-Tetrachloroethane	50	U
127-18-4	**Tetrachloroethene**	**900**	**B**
108-88-3	Toluene	50	U
71-55-6	1,1,1-Trichloroethane	50	U
79-00-5	1,1,2-Trichloroethane	50	U
79-01-6	**Trichloroethene**	**57**	
75-01-4	Vinyl chloride	50	U
1330-20-7	Xylenes (total)	50	U

FORM I

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 007
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9ED1AA Date Extracted:11/10/00
Dilution factor: 50 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-047-001101

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 008
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EG1AA Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-048-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5.0	U
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	**Carbon tetrachloride**	**0.18**	**J**
108-90-7	**Chlorobenzene**	**0.73**	**J**
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	**1,2-Dichlorobenzene**	**0.21**	**J**
541-73-1	**1,3-Dichlorobenzene**	**0.35**	**J**
106-46-7	**1,4-Dichlorobenzene**	**0.81**	**J B**
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	**1,1-Dichloroethene**	**0.12**	**J**
156-59-2	**cis-1,2-Dichloroethene**	**18**	
156-60-5	**trans-1,2-Dichloroethene**	**0.12**	**J**
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 008
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EG1AA Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-048-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	Methylene chloride	0.71	J
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	3.6	B
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	3.8	
75-01-4	Vinyl chloride	10	
1330-20-7	Xylenes (total)	1.0	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 008
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EG1AA Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-048-001101

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
556-67-2	Cyclotetrasiloxane, octameth	20.252	2.9	NJ

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 009
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EH1AA Date Extracted:11/10/00
Dilution factor: 33.33 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-049-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	170	U
71-43-2	Benzene	33	U
74-97-5	Bromochloromethane	33	U
75-27-4	Bromodichloromethane	33	U
75-25-2	Bromoform	33	U
74-83-9	Bromomethane	33	U
78-93-3	2-Butanone	170	U
75-15-0	Carbon disulfide	33	U
56-23-5	Carbon tetrachloride	33	U
108-90-7	Chlorobenzene	33	U
124-48-1	Dibromochloromethane	33	U
96-12-8	1,2-Dibromo-3-chloropropane	67	U
75-00-3	Chloroethane	33	U
67-66-3	Chloroform	33	U
74-87-3	Chloromethane	33	U
106-93-4	1,2-Dibromoethane	33	U
95-50-1	1,2-Dichlorobenzene	33	U
541-73-1	1,3-Dichlorobenzene	33	U
106-46-7	1,4-Dichlorobenzene	4.6	J B
75-34-3	1,1-Dichloroethane	33	U
107-06-2	1,2-Dichloroethane	33	U
75-35-4	1,1-Dichloroethene	33	U
156-59-2	cis-1,2-Dichloroethene	470	
156-60-5	trans-1,2-Dichloroethene	33	U
78-87-5	1,2-Dichloropropane	33	U
10061-01-5	cis-1,3-Dichloropropene	33	U
10061-02-6	trans-1,3-Dichloropropene	33	U
100-41-4	Ethylbenzene	33	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 009
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EH1AA Date Extracted:11/10/00
Dilution factor: 33.33 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-049-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	170	U
75-09-2	Methylene chloride	67	U
108-10-1	4-Methyl-2-pentanone	33	U
100-42-5	Styrene	33	U
79-34-5	1,1,2,2-Tetrachloroethane	33	U
127-18-4	**Tetrachloroethene**	**130**	**B**
108-88-3	Toluene	33	U
71-55-6	1,1,1-Trichloroethane	33	U
79-00-5	1,1,2-Trichloroethane	33	U
79-01-6	**Trichloroethene**	**62**	
75-01-4	**Vinyl chloride**	**200**	
1330-20-7	Xylenes (total)	33	U

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FORM I

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 009
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EH1AA Date Extracted:11/10/00
Dilution factor: 33.33 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: MW33-049-001101

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

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Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WQ Lab Sample ID:A0K020178 011
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EK1AA Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: HOLD BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5.0	U
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WQ Lab Sample ID:A0K020178 011
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EK1AA Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: HOLD BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	Methylene chloride	0.51	J
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WQ Lab Sample ID:A0K020178 011
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EK1AA Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: HOLD BLANK

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
556-67-2	Cyclotetrasiloxane, octameth	20.252	2.3	NJ

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0K01212

Matrix: (soil/water) WQ Lab Sample ID: A0K020178 010
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EJ1AA Date Extracted: 11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5.0	U
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	0.67	J
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WQ Lab Sample ID:A0K020178 010
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/02/00
Work Order: DN9EJ1AA Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0316150

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	**Methylene chloride**	**1.1**	**J**
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WQ Lab Sample ID:A0K010212 010
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6181AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	5.0	U
71-43-2	Benzene	1.0	U
74-97-5	Bromochloromethane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
78-93-3	2-Butanone	5.0	U
75-15-0	Carbon disulfide	0.63	J
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	2.0	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WQ Lab Sample ID:A0K010212 010
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6181AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:

QC Batch: 0315344

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	5.0	U
75-09-2	**Methylene chloride**	**0.98**	**J**
108-10-1	4-Methyl-2-pentanone	1.0	U
100-42-5	Styrene	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WQ Lab Sample ID:A0K010212 010
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 11/01/00
Work Order: DN6181AA Date Extracted:11/09/00
Dilution factor: 1 Date Analyzed: 11/09/00
Moisture %:
QC Batch: 0315344

Client Sample Id: TRIP BLANK

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	None			

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RMT

Client Sample ID: 32/33-MPE-US-I-1-23

GC/MS Volatiles

Lot-Sample #...: A0J130271-001 Work Order #...: DM5GR1AA Matrix.....: WG
Date Sampled...: 10/12/00 17:00 Date Received..: 10/13/00
Prep Date.....: 10/17/00 Analysis Date..: 10/17/00
Prep Batch #...: 0291198
Dilution Factor: 33.33 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	67	ug/L
Bromomethane	ND	67	ug/L
Vinyl chloride	ND	67	ug/L
Chloroethane	ND	67	ug/L
Methylene chloride	13 J,B	33	ug/L
Acetone	170 J,B	330	ug/L
Carbon disulfide	8.0 J	33	ug/L
1,1-Dichloroethene	ND	33	ug/L
1,1-Dichloroethane	8.2 J	33	ug/L
1,2-Dichloroethene (total)	29 J	33	ug/L
Chloroform	12 J	33	ug/L
1,2-Dichloroethane	10 J	33	ug/L
2-Butanone	390	330	ug/L
1,1,1-Trichloroethane	8.2 J	33	ug/L
Carbon tetrachloride	9.5 J	33	ug/L
Bromodichloromethane	8.2 J	33	ug/L
1,2-Dichloropropane	ND	33	ug/L
cis-1,3-Dichloropropene	ND	33	ug/L
Trichloroethene	870	33	ug/L
Dibromochloromethane	7.4 J	33	ug/L
1,1,2-Trichloroethane	7.8 J	33	ug/L
Benzene	8.5 J	33	ug/L
trans-1,3-Dichloropropene	5.2 J	33	ug/L
Bromoform	7.1 J	33	ug/L
4-Methyl-2-pentanone	ND	330	ug/L
2-Hexanone	ND	330	ug/L
Tetrachloroethene	55	33	ug/L
1,1,2,2-Tetrachloroethane	11 J	33	ug/L
Toluene	7.6 J	33	ug/L
Chlorobenzene	24 J	33	ug/L
Ethylbenzene	ND	33	ug/L
Styrene	ND	33	ug/L
Xylenes (total)	ND	33	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	97	(61 - 128)
Toluene-d8	83	(76 - 110)
Dibromofluoromethane	98	(73 - 122)
4-Bromofluorobenzene	85	(74 - 116)

(Continued on next page)

EMT

Client Sample ID: 32/33-MPE-US-I-1-23

GC/MS Volatiles

Lot-Sample #...: A0J130271-001 Work Order #...: DMSGR1AA Matrix.....: WG

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

RMT

Client Sample ID: WW32/33-004-001003

GC/MS Volatiles

Lot-Sample #...: A0J040220-001 Work Order #...: DLHTW101 Matrix.....: WG
Date Sampled...: 10/03/00 17:10 Date Received..: 10/04/00
Prep Date.....: 10/05/00 Analysis Date..: 10/05/00
Prep Batch #...: 0280109
Dilution Factor: 16.66 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Chloromethane	ND	33	ug/L
Bromomethane	ND	33	ug/L
Vinyl chloride	ND	33	ug/L
Chloroethane	ND	33	ug/L
Methylene chloride	ND	17	ug/L
Acetone	ND	170	ug/L
Carbon disulfide	ND	17	ug/L
1,1-Dichloroethene	ND	17	ug/L
1,1-Dichloroethane	ND	17	ug/L
1,2-Dichloroethene (total)	2.9 J	17	ug/L
Chloroform	7.8 J	17	ug/L
1,2-Dichloroethane	ND	17	ug/L
2-Butanone	ND	170	ug/L
1,1,1-Trichloroethane	ND	17	ug/L
Carbon tetrachloride	ND	17	ug/L
Bromodichloromethane	ND	17	ug/L
1,2-Dichloropropane	ND	17	ug/L
cis-1,3-Dichloropropene	ND	17	ug/L
Trichloroethene	330	17	ug/L
Dibromochloromethane	ND	17	ug/L
1,1,2-Trichloroethane	ND	17	ug/L
Benzene	2.9 J,B	17	ug/L
trans-1,3-Dichloropropene	ND	17	ug/L
Bromoform	ND	17	ug/L
4-Methyl-2-pentanone	ND	170	ug/L
2-Hexanone	ND	170	ug/L
Tetrachloroethene	ND	17	ug/L
1,1,2,2-Tetrachloroethane	ND	17	ug/L
Toluene	4.1 J	17	ug/L
Chlorobenzene	3.2 J	17	ug/L
Ethylbenzene	ND	17	ug/L
Styrene	ND	17	ug/L
Xylenes (total)	ND	17	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	106	(61 - 128)
Toluene-d8	89	(76 - 110)
Dibromofluoromethane	114	(73 - 122)
4-Bromofluorobenzene	91	(74 - 116)

(Continued on next page)

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EMT

Client Sample ID: WW32/33-004-001003

GC/MS Volatiles

Lot-Sample #...: A0J040220-001 Work Order #...: DLHTW101 Matrix.....: WG

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Dissolved Gases Data Sheets

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 007
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 40 / mL Date Received: 11/01/00
Work Order: DN6121AK Date Extracted:11/07/00
Dilution factor: 1 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322095

Client Sample Id: MW33-007-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	28	
74-84-0	Ethane	1.4	
74-85-1	Ethene	1.5	

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0K01212

Matrix: (soil/water) WG Lab Sample ID: A0K010212 005
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample Wt/Vol: 40 / mL Date Received: 11/01/00
Work Order: DW6101AK Date Extracted: 11/07/00
Dilution factor: 1 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322095

Client Sample Id: FDUP-33001-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	27	
74-84-0	Ethane	1.4	
74-85-1	Ethene	1.4	

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 001
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN8ER1AK Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-008-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	0.50	U
74-84-0	Ethane	0.81	
74-85-1	Ethene	0.50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 002
Method: ESK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9D51AX Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-009-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	270	E
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 002
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9D52AK Date Extracted:11/10/00
Dilution factor: 10 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-009-001101 -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	660	D
74-84-0	Ethane	5.0	U
74-85-1	Ethene	5.0	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0K01212

Matrix: (soil/water) WG Lab Sample ID: A0K020178 C03
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9D61AX Date Extracted: 11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-013-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	22	
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 006
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 40 / mL Date Received: 11/01/00
Work Order: DN6111AK Date Extracted:11/07/00
Dilution factor: 1 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322095

Client Sample Id: MW33-021-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	3.2	
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 004
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample Wt/Vol: 40 / mL Date Received: 11/01/00
Work Order: DN61R1A4 Date Extracted:11/07/00
Dilution factor: 10 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322093

Client Sample Id: MW33-024-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	210	D
74-84-0	Ethane	5.0	U
74-85-1	Ethene	5.0	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 004
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 40 / mL Date Received: 11/01/00
Work Order: DN61R2A4 Date Extracted:11/07/00
Dilution factor: 1 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322093

Client Sample Id: MW33-024-103100 -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	250	E
74-84-0	Ethane	0.59	
74-85-1	Ethene	0.52	

RMC

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020176 004
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9D71AK Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-027-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	320	E
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 004
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9D72AK Date Extracted:11/10/00
Dilution factor: 10 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-027-001101 -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	310	D
74-84-0	Ethane	5.0	U
74-85-1	Ethene	5.0	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:OK01212

Matrix: (soil/water) WG Lab Sample ID:AOK020178 005
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample Wt/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9D91AX Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-030-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	25	
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG
Method: RSK SOP-175
Dissolved Gases in Water

Lab Sample ID:A0K010212 008

mg/L

Sample WT/Vol: 40 / mL
Work Order: DN6141AK
Dilution factor: 1
Moisture %:

Date Received: 11/01/00
Date Extracted:11/07/00
Date Analyzed: 11/07/00

QC Batch: 0322095

Client Sample Id: MW33-042-103100

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	3.8	
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number: OK01212

Matrix: (soil/water) WG Lab Sample ID: AOK010212 009
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 40 / mL Date Received: 11/01/00
Work Order: DN6171AK Date Extracted: 11/07/00
Dilution factor: 1 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322095

Client Sample Id: MW33-043-103000

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	1.6	
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number: 0K01212

Matrix: (soil/water) WG Lab Sample ID: A0K010212 001
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 40 / mL Date Received: 11/01/00
Work Order: DN61G1AK Date Extracted: 11/07/00
Dilution factor: 1 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322093

Client Sample Id: MW33-044-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	4.2	
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number: OK01212

Matrix: (soil/water) WG Lab Sample ID: ADK010212 002
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 40 / mL Date Received: 11/01/00
Work Order: DX61N1AK Date Extracted: 11/07/00
Dilution factor: 1 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322093

Client Sample Id: MW33-045-001031

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	320	B
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 002
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 40 / mL Date Received: 11/01/00
Work Order: DN61N2AK Date Extracted:11/07/00
Dilution factor: 10 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322095

Client Sample Id: MW33-045-001031 -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	390	D
74-84-0	Ethane	5.0	U
74-85-1	Ethene	5.0	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number: OK01212

Matrix: (soil/water) WG Lab Sample ID: AOK010212 003
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 40 / mL Date Received: 11/01/00
Work Order: DN61P1AX Date Extracted: 11/07/00
Dilution factor: 1 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322093

Client Sample Id: FDUP33-002-001031

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/kg) ug/L	Q
74-82-8	Methane	320	E
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K010212 003
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 40 / mL Date Received: 11/01/00
Work Order: DN61P2AK Date Extracted:11/07/00
Dilution factor: 10 Date Analyzed: 11/07/00
Moisture %:

QC Batch: 0322095

Client Sample Id: FDUP33-002-001031 -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	310	D
74-84-0	Ethane	5.0	U
74-85-1	Ethene	5.0	U

Lab Name: Severn Trent Laboratories, Inc. SDG Number: DK01212

Matrix: (soil/water) WG Lab Sample ID: A0K020178 006
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9EC1AK Date Extracted: 11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-046-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	5.3	
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 007
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9ED1AK Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-047-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	12	
74-84-0	Ethane	0.50	U
74-85-1	Ethene	0.50	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0R01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 008
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9EG1AK Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-048-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	14	
74-84-0	Ethane	0.53	
74-85-1	Ethene	0.50	U

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K020178 009
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9EH1AK Date Extracted:11/10/00
Dilution factor: 1 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-049-001101

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	230	E
74-84-0	Ethane	7.2	
74-85-1	Ethene	2.4	

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0K01212

Matrix: (soil/water) WG Lab Sample ID:A0K030178 009
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 43 / mL Date Received: 11/02/00
Work Order: DN9EH2AX Date Extracted:11/10/00
Dilution factor: 6 Date Analyzed: 11/10/00
Moisture %:

QC Batch: 0318497

Client Sample Id: MW33-049-001101 -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	400	D
74-84-0	Ethane	12	D
74-85-1	Ethene	4.0	D

Metals Data Sheets

RMT

Client Sample ID: 32/33-MPE-US-I-1-23

TOTAL Metals

Lot-Sample #...: A0J130275-001 Matrix.....: WG
Date Sampled...: 10/12/00 17:00 Date Received..: 10/13/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0290111						
Arsenic	ND	0.010	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AA
		Dilution Factor: 1				
Antimony	ND	0.060	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AF
		Dilution Factor: 1				
Beryllium	ND	0.0050	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AG
		Dilution Factor: 1				
Lead	ND	0.0030	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AC
		Dilution Factor: 1				
Selenium	ND	0.0050	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AD
		Dilution Factor: 1				
Cadmium	ND	0.0050	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AH
		Dilution Factor: 1				
Thallium	ND	0.010	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AE
		Dilution Factor: 1				
Chromium	ND	0.010	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AJ
		Dilution Factor: 1				
Copper	ND	0.025	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AK
		Dilution Factor: 1				
Nickel	ND	0.040	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AL
		Dilution Factor: 1				
Silver	ND	0.010	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AM
		Dilution Factor: 1				
Zinc	ND	0.020	mg/L	SW846 6010B	10/16-10/17/00	DM5H21AN
		Dilution Factor: 1				
Mercury	ND	0.00020	mg/L	SW846 7470A	10/16-10/17/00	DM5H21AP
		Dilution Factor: 1				

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RMT

Client Sample ID: WW32/33-004-001003

TOTAL Metals

Lot-Sample #...: A0J040220-001 Matrix.....: WG
Date Sampled...: 10/03/00 17:10 Date Received..: 10/04/00

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION-ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 0279104						
Arsenic	ND	0.010	mg/L	SW846 6010B	10/05/00	DLHTW103
		Dilution Factor: 1				
Antimony	ND	0.060	mg/L	SW846 6010B	10/05/00	DLHTW107
		Dilution Factor: 1				
Beryllium	ND	0.0050	mg/L	SW846 6010B	10/05/00	DLHTW108
		Dilution Factor: 1				
Lead	**0.0080**	**0.0030**	**mg/L**	**SW846 6010B**	**10/05/00**	**DLHTW104**
		Dilution Factor: 1				
Cadmium	ND	0.0050	mg/L	SW846 6010B	10/05/00	DLHTW109
		Dilution Factor: 1				
Selenium	ND	0.0050	mg/L	SW846 6010B	10/05/00	DLHTW105
		Dilution Factor: 1				
Chromium	**0.040**	**0.010**	**mg/L**	**SW846 6010B**	**10/05/00**	**DLHTW10A**
		Dilution Factor: 1				
Thallium	ND	0.010	mg/L	SW846 6010B	10/05/00	DLHTW106
		Dilution Factor: 1				
Copper	ND	0.025	mg/L	SW846 6010B	10/05/00	DLHTW10C
		Dilution Factor: 1				
Nickel	ND	0.040	mg/L	SW846 6010B	10/05/00	DLHTW10D
		Dilution Factor: 1				
Silver	ND	0.010	mg/L	SW846 6010B	10/05/00	DLHTW10E
		Dilution Factor: 1				
Zinc	**0.061 L**	**0.020**	**mg/L**	**SW846 6010B**	**10/05/00**	**DLHTW10F**
		Dilution Factor: 1				
Mercury	ND	0.00020	mg/L	SW846 7470A	10/05/00	DLHTW10G
		Dilution Factor: 1				

NOTE(S):

L Serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present

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PCBs Data Sheets

RMT

Client Sample ID: 32/33-MPE-US-I-1-23

GC Semivolatiles

Lot-Sample #...: A0J130271-001 Work Order #...: DM5GR1AC Matrix.....: WG
Date Sampled...: 10/12/00 17:00 Date Received..: 10/13/00
Prep Date.....: 10/13/00 Analysis Date..: 10/17/00
Prep Batch #...: 0286400
Dilution Factor: 10 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
PCB-1016	21	10	ug/L
PCB-1221	ND	10	ug/L
PCB-1232	ND	10	ug/L
PCB-1242	ND	10	ug/L
PCB-1248	ND	10	ug/L
PCB-1254	ND	10	ug/L
PCB-1260	ND	10	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	110 DIL	(45 - 120)
Decachlorobiphenyl	110 DIL	(24 - 128)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

EMT

Client Sample ID: WW32/33-004-001003

GC Semivolatiles

Lot-Sample #...: A0J040220-001 Work Order #...: DLHTW102 Matrix.....: WG
Date Sampled...: 10/03/00 17:10 Date Received..: 10/04/00
Prep Date.....: 10/04/00 Analysis Date..: 10/06/00
Prep Batch #...: 0278092
Dilution Factor: 1 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
PCB-1016	ND	1.0	ug/L
PCB-1221	ND	1.0	ug/L
PCB-1232	ND	1.0	ug/L
PCB-1242	2.5	1.0	ug/L
PCB-1248	ND	1.0	ug/L
PCB-1254	4.9	1.0	ug/L
PCB-1260	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	73	(45 - 120)
Decachlorobiphenyl	15 *	(24 - 128)

NOTE(S):

* Surrogate recovery is outside stated control limits.

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Wet Chemistry Data Sheets

RMT

Client Sample ID: MW33-007-001031

General Chemistry

Lot-Sample #...: A0K010212-007 **Work Order #...:** DN612 **Matrix.....:** WG
Date Sampled...: 10/31/00 10:10 **Date Received..:** 11/01/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**54.2**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/16/00**	**0323122**
	Dilution Factor: 1					
Nitrate-Nitrite	**0.1**	**0.1**	**mg/L**	**MCAWW 353.2**	**11/02/00**	**0308105**
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320532
	Dilution Factor: 1					
Sulfate	**481**	**5.0**	**mg/L**	**MCAWW 300.0A**	**11/14/00**	**0321400**
	Dilution Factor: 5					
Total Alkalinity	**480**	**5.0**	**mg/L**	**MCAWW 310.1**	**11/14/00**	**0320132**
	Dilution Factor: 1					
Total Dissolved Solids	**1200**	**13**	**mg/L**	**MCAWW 160.1**	**11/02-11/03/00**	**0307469**
	Dilution Factor: 1.33					
Total Organic Carbon	**4**	**1**	**mg/L**	**SW846 9060**	**11/16/00**	**0321133**
	Dilution Factor: 1					

RMT

Client Sample ID: FDUP-33001-103100

General Chemistry

Lot-Sample #...: A0K010212-005 Work Order #...: DN610 Matrix.....: WG
Date Sampled...: 10/31/00 Date Received..: 11/01/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	53.8	1.0	mg/L	MCAWW 300.0A	11/16/00	0323122
	Dilution Factor: 1					
Nitrate-Nitrite	0.1	0.1	mg/L	MCAWW 353.2	11/02/00	0308104
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320532
	Dilution Factor: 1					
Sulfate	492	5.0	mg/L	MCAWW 300.0A	11/13/00	0321400
	Dilution Factor: 5					
Total Alkalinity	470	5.0	mg/L	MCAWW 310.1	11/14/00	0320132
	Dilution Factor: 1					
Total Dissolved Solids	1200	12	mg/L	MCAWW 160.1	11/02-11/03/00	0307469
	Dilution Factor: 1.25					
Total Organic Carbon	4	1	mg/L	SW846 9060	11/16/00	0321133
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-008-001101

General Chemistry

Lot-Sample #...: A0K020178-001 Work Order #...: DN8HR Matrix.....: WG
Date Sampled...: 11/01/00 14:45 Date Received..: 11/02/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	117	5.0	mg/L	MCAWW 300.0A	11/14/00	0321395
	Dilution Factor: 5					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/16/00	0321407
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320535
	Dilution Factor: 1					
Sulfate	413	5.0	mg/L	MCAWW 300.0A	11/14/00	0321400
	Dilution Factor: 5					
Total Alkalinity	300	5.0	mg/L	MCAWW 310.1	11/14/00	0320132
	Dilution Factor: 1					
Total Dissolved Solids	990	11	mg/L	MCAWW 160.1	11/06-11/07/00	0312157
	Dilution Factor: 1.11					
Total Organic Carbon	2	1	mg/L	SW846 9060	11/16/00	0322137
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-009-001101

General Chemistry

Lot-Sample #...: A0K020178-002 Work Order #...: DN9D5 Matrix.....: WG
Date Sampled...: 11/01/00 14:00 Date Received..: 11/02/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	335	5.0	mg/L	MCAWW 300.0A	11/14/00	0321395
	Dilution Factor: 5					
Nitrate-Nitrite	0.3	0.1	mg/L	MCAWW 353.2	11/16/00	0321407
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320535
	Dilution Factor: 1					
Sulfate	196	5.0	mg/L	MCAWW 300.0A	11/14/00	0321400
	Dilution Factor: 5					
Total Alkalinity	410	5.0	mg/L	MCAWW 310.1	11/14/00	0320132
	Dilution Factor: 1					
Total Dissolved Solids	1200	13	mg/L	MCAWW 160.1	11/06-11/07/00	0312157
	Dilution Factor: 1.33					
Total Organic Carbon	4	1	mg/L	SW846 9060	11/16/00	0322137
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-013-001101

General Chemistry

Lot-Sample #...: A0K020178-003 Work Order #...: DN9D6 Matrix.....: WG
Date Sampled...: 11/01/00 10:30 Date Received..: 11/02/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	27.1	1.0	mg/L	MCAWW 300.0A	11/14/00	0321431
	Dilution Factor: 1					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/16/00	0321407
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320535
	Dilution Factor: 1					
Sulfate	190	1.0	mg/L	MCAWW 300.0A	11/14/00	0321436
	Dilution Factor: 1					
Total Alkalinity	400	5.0	mg/L	MCAWW 310.1	11/14/00	0320132
	Dilution Factor: 1					
Total Dissolved Solids	740	10	mg/L	MCAWW 160.1	11/06-11/07/00	0312157
	Dilution Factor: 1					
Total Organic Carbon	3	1	mg/L	SW846 9060	11/16/00	0322137
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-021-103100

General Chemistry

Lot-Sample #...: A0K010212-006 Work Order #...: DN611 Matrix.....: WG
Date Sampled...: 10/31/00 14:00 Date Received..: 11/01/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	111	5.0	mg/L	MCAWW 300.0A	11/13/00	0321395
	Dilution Factor: 5					
Nitrate-Nitrite	0.3	0.1	mg/L	MCAWW 353.2	11/02/00	0308104
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320532
	Dilution Factor: 1					
Sulfate	939	5.0	mg/L	MCAWW 300.0A	11/13/00	0321400
	Dilution Factor: 5					
Total Alkalinity	350	5.0	mg/L	MCAWW 310.1	11/14/00	0320132
	Dilution Factor: 1					
Total Dissolved Solids	1800	17	mg/L	MCAWW 160.1	11/02-11/03/00	0307469
	Dilution Factor: 1.67					
Total Organic Carbon	2	1	mg/L	SW846 9060	11/16/00	0321133
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-024-103100

General Chemistry

Lot-Sample #...: A0K010212-004 **Work Order #...:** DN61R **Matrix.....:** WG
Date Sampled...: 10/31/00 10:30 **Date Received..:** 11/01/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**39.8**	**2.0**	**mg/L**	**MCAWW 300.0A**	**11/14/00**	**0321431**
	Dilution Factor: 1					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/02/00	0308104
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320532
	Dilution Factor: 1					
Sulfate	**195**	**25.0**	**mg/L**	**MCAWW 300.0A**	**11/14/00**	**0321436**
	Dilution Factor: 5					
Total Alkalinity	**430**	**5.0**	**mg/L**	**MCAWW 310.1**	**11/14/00**	**0320132**
	Dilution Factor: 1					
Total Dissolved Solids	**770**	**10**	**mg/L**	**MCAWW 160.1**	**11/02-11/03/00**	**0307472**
	Dilution Factor: 1					
Total Organic Carbon	**2**	**1**	**mg/L**	**SW846 9060**	**11/15/00**	**0321133**
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-027-001101

General Chemistry

Lot-Sample #...: AGK020178-004 Work Order #...: DN9D7 Matrix.....: WG
Date Sampled...: 11/01/00 14:45 Date Received..: 11/02/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	191	5.0	mg/L	MCAWW 300.0A	11/14/00	0321395
	Dilution Factor: 5					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/16/00	0321407
	Dilution Factor: 1					
Nitrogen, as Ammonia	0.4	0.2	mg/L	MCAWW 350.3	11/15/00	0320535
	Dilution Factor: 1					
Sulfate	294	5.0	mg/L	MCAWW 300.0A	11/14/00	0321400
	Dilution Factor: 5					
Total Alkalinity	510	5.0	mg/L	MCAWW 310.1	11/14/00	0320135
	Dilution Factor: 1					
Total Dissolved Solids	1200	13	mg/L	MCAWW 160.1	11/06-11/07/00	0312157
	Dilution Factor: 1.33					
Total Organic Carbon	3	1	mg/L	SW846 9060	11/16/00	0322137
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-030-001101

General Chemistry

Lot-Sample #...: A0K020178-005 Work Order #...: DN9D9 Matrix.....: WG
Date Sampled...: 11/01/00 09:50 Date Received..: 11/02/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**144**	**5.0**	**mg/L**	**MCAWW 300.0A**	**11/14/00**	**0321395**
	Dilution Factor: 5					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/16/00	0321407
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320535
	Dilution Factor: 1					
Sulfate	**544**	**5.0**	**mg/L**	**MCAWW 300.0A**	**11/14/00**	**0321400**
	Dilution Factor: 5					
Total Alkalinity	**330**	**5.0**	**mg/L**	**MCAWW 310.1**	**11/14/00**	**0320135**
	Dilution Factor: 1					
Total Dissolved Solids	**1300**	**13**	**mg/L**	**MCAWW 160.1**	**11/06-11/07/00**	**0312157**
	Dilution Factor: 1.33					
Total Organic Carbon	**2**	**1**	**mg/L**	**SW846 9060**	**11/17/00**	**0322137**
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-042-103100

General Chemistry

Lot-Sample #...: A0K010212-008 Work Order #...: DN614 Matrix.....: WG
Date Sampled...: 10/31/00 16:00 Date Received..: 11/01/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	182	5.0	mg/L	MCAWW 300.0A	11/14/00	0321395
	Dilution Factor: 5					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/02/00	0308105
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320532
	Dilution Factor: 1					
Sulfate	487	5.0	mg/L	MCAWW 300.0A	11/14/00	0321400
	Dilution Factor: 5					
Total Alkalinity	230	5.0	mg/L	MCAWW 310.1	11/14/00	0320132
	Dilution Factor: 1					
Total Dissolved Solids	1200	12	mg/L	MCAWW 160.1	11/02-11/03/00	0307469
	Dilution Factor: 1.25					
Total Organic Carbon	2	1	mg/L	SW846 9060	11/16/00	0321133
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-043-103000

General Chemistry

Lot-Sample #...: A0K010212-009 Work Order #...: DN617 Matrix.....: WG
Date Sampled...: 10/30/00 17:10 Date Received..: 11/01/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	219	5.0	mg/L	MCAWW 300.0A	11/14/00	0321395
	Dilution Factor: 5					
Nitrate-Nitrite	0.2	0.1	mg/L	MCAWW 353.2	11/02/00	0308105
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320532
	Dilution Factor: 1					
Sulfate	544	5.0	mg/L	MCAWW 300.0A	11/14/00	0321400
	Dilution Factor: 5					
Total Alkalinity	330	5.0	mg/L	MCAWW 310.1	11/11/00	0319207
	Dilution Factor: 1					
Total Dissolved Solids	900	13	mg/L	MCAWW 160.1	11/02-11/03/00	0307469
	Dilution Factor: 1.33					
Total Organic Carbon	1	1	mg/L	SW846 9060	11/16/00	0321133
	Dilution Factor: 1					

EMT

Client Sample ID: MW33-044-001031

General Chemistry

Lot-Sample #...: A0K010212-001 Work Order #...: DN61G Matrix.....: WG
Date Sampled...: 10/31/00 13:15 Date Received..: 11/01/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	196	5.0	mg/L	MCAWW 300.0A	11/13/00	0321395
	Dilution Factor: 5					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/02/00	0308104
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320532
	Dilution Factor: 1					
Sulfate	498	5.0	mg/L	MCAWW 300.0A	11/13/00	0321400
	Dilution Factor: 5					
Total Alkalinity	430	5.0	mg/L	MCAWW 310.1	11/14/00	0320132
	Dilution Factor: 1					
Total Dissolved Solids	1400	14	mg/L	MCAWW 160.1	11/02-11/03/00	0307469
	Dilution Factor: 1.43					
Total Organic Carbon	2	1	mg/L	SW846 9060	11/15/00	0321133
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-045-001031

General Chemistry

Lot-Sample #...: A0K010212-002 Work Order #...: DN61N Matrix.....: WG
Date Sampled...: 10/31/00 14:15 Date Received..: 11/01/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	202	5.0	mg/L	MCAWW 300.0A	11/13/00	0321395
	Dilution Factor: 5					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/02/00	0308104
	Dilution Factor: 1					
Nitrogen, as Ammonia	1.2	0.2	mg/L	MCAWW 350.3	11/15/00	0320532
	Dilution Factor: 1					
Sulfate	22.7	1.0	mg/L	MCAWW 300.0A	11/14/00	0321436
	Dilution Factor: 1					
Total Alkalinity	480	5.0	mg/L	MCAWW 310.1	11/14/00	0320132
	Dilution Factor: 1					
Total Dissolved Solids	790	10	mg/L	MCAWW 160.1	11/02-11/03/00	0307469
	Dilution Factor: 1					
Total Organic Carbon	3	1	mg/L	SW846 9060	11/15/00	0321133
	Dilution Factor: 1					

RMT

Client Sample ID: FDUP33-002-001031

General Chemistry

Lot-Sample #...: A0K010212-003 Work Order #...: DN61P Matrix.....: WG
Date Sampled...: 10/31/00 Date Received..: 11/01/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	198	5.0	mg/L	MCAWW 300.0A	11/13/00	0321395
	Dilution Factor: 5					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/02/00	0308104
	Dilution Factor: 1					
Nitrogen, as Ammonia	1.3	0.2	mg/L	MCAWW 350.3	11/15/00	0320532
	Dilution Factor: 1					
Sulfate	22.6	1.0	mg/L	MCAWW 300.0A	11/14/00	0321436
	Dilution Factor: 1					
Total Alkalinity	470	5.0	mg/L	MCAWW 310.1	11/14/00	0320132
	Dilution Factor: 1					
Total Dissolved Solids	780	10	mg/L	MCAWW 160.1	11/02-11/03/00	0307469
	Dilution Factor: 1					
Total Organic Carbon	3	1	mg/L	SW846 9060	11/15/00	0321133
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-046-001101

General Chemistry

Lot-Sample #...: A0K020178-006 **Work Order #...:** DN9EC **Matrix.....:** WG
Date Sampled...: 11/01/00 15:00 **Date Received..:** 11/02/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**10.5**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/14/00**	**0321395**
	Dilution Factor: 1					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/16/00	0321407
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320535
	Dilution Factor: 1					
Sulfate	**38.4**	**1.0**	**mg/L**	**MCAWW 300.0A**	**11/14/00**	**0321400**
	Dilution Factor: 1					
Total Alkalinity	**150**	**5.0**	**mg/L**	**MCAWW 310.1**	**11/14/00**	**0320135**
	Dilution Factor: 1					
Total Dissolved Solids	**240**	**10**	**mg/L**	**MCAWW 160.1**	**11/06-11/07/00**	**0312157**
	Dilution Factor: 1					
Total Organic Carbon	ND	1	mg/L	SW846 9060	11/17/00	0322137
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-047-001101

General Chemistry

Lot-Sample #...: A0K020178-007 Work Order #...: DN9ED Matrix.....: WG
Date Sampled...: 11/01/00 17:00 Date Received..: 11/02/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	50.9	5.0	mg/L	MCAWW 300.0A	11/14/00	0321395
	Dilution Factor: 1					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/16/00	0321407
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320535
	Dilution Factor: 1					
Sulfate	613	5.0	mg/L	MCAWW 300.0A	11/14/00	0321400
	Dilution Factor: 5					
Total Alkalinity	340	5.0	mg/L	MCAWW 310.1	11/14/00	0320135
	Dilution Factor: 1					
Total Dissolved Solids	1200	12	mg/L	MCAWW 160.1	11/06-11/07/00	0312157
	Dilution Factor: 1.25					
Total Organic Carbon	2	1	mg/L	SW846 9060	11/17/00	0322137
	Dilution Factor: 1					

RMT

Client Sample ID: MW33-048-001101

General Chemistry

Lot-Sample #...: A0K020178-008 Work Order #...: DN9EG Matrix.....: WG
Date Sampled...: 11/01/00 16:45 Date Received..: 11/02/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	11.2	1.0	mg/L	MCAWW 300.0A	11/14/00	0321395
	Dilution Factor: 1					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/16/00	0321407
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320535
	Dilution Factor: 1					
Sulfate	13.7	1.0	mg/L	MCAWW 300.0A	11/14/00	0321400
	Dilution Factor: 1					
Total Alkalinity	310	5.0	mg/L	MCAWW 310.1	11/14/00	0320135
	Dilution Factor: 1					
Total Dissolved Solids	350	10	mg/L	MCAWW 160.1	11/06-11/07/00	0312157
	Dilution Factor: 1					
Total Organic Carbon	3	1	mg/L	SW846 9060	11/17/00	0322137
	Dilution Factor: 1					

RMT

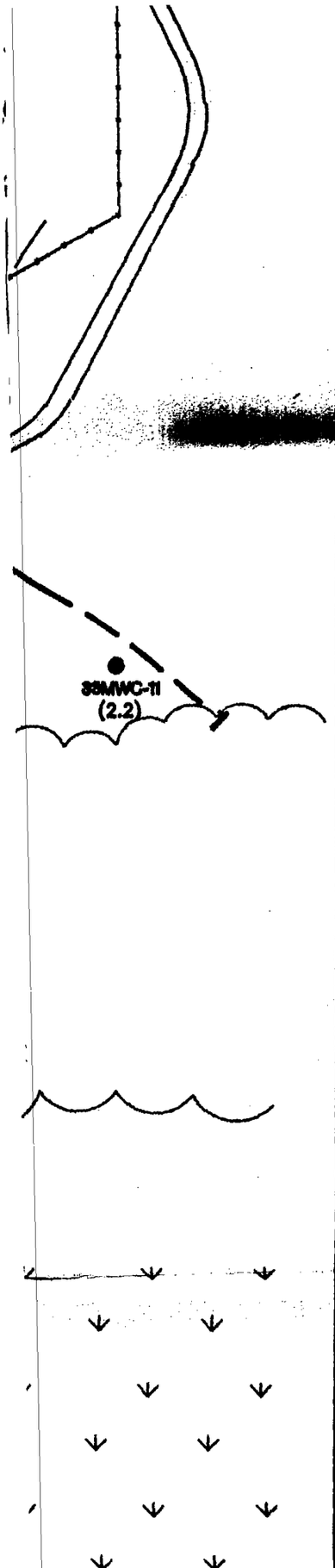
Client Sample ID: MW33-049-001101

General Chemistry

Lot-Sample #...: A0K020178-009 Work Order #...: DN9EH Matrix.....: WG
Date Sampled...: 11/01/00 14:00 Date Received..: 11/02/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	10.2	1.0	mg/L	MCAWW 300.0A	11/14/00	0321431
	Dilution Factor: 1					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/16/00	0321407
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	11/15/00	0320535
	Dilution Factor: 1					
Sulfate	16.0	1.0	mg/L	MCAWW 300.0A	11/14/00	0321436
	Dilution Factor: 1					
Total Alkalinity	350	5.0	mg/L	MCAWW 310.1	11/15/00	0321349
	Dilution Factor: 1					
Total Dissolved Solids	390	10	mg/L	MCAWW 160.1	11/06-11/07/00	0312157
	Dilution Factor: 1					
Total Organic Carbon	2	1	mg/L	SW846 9060	11/17/00	0322137
	Dilution Factor: 1					

Appendix J
Total VOC Plume Map from Pre-Design Workplan



APPROXIMATE LOCATION OF WOODED AREAS WEST OF SITE 32/33

NOTES

1. SOURCE: BASE MAP FROM "1998 TCE INVESTIGATION, WORKPLAN AND PILOT STUDY FOR THE PCB OPERABLE UNIT AT THE CRAB ORCHARD NATIONAL WILDLIFE REFUGE SUPERFUND SITE, MARION, ILLINOIS" REV. 1, MAY 1998, PREPARED BY FLUOR DANIEL GTI.
2. * INDICATES WELL IS SCREENED ACROSS THE UPPER SAND UNIT. OTHER BORINGS AND MONITORING WELLS ARE COMPLETED IN THE UPPER CLAY AND/OR THE UPPERMOST PORTION OF THE UPPER SAND UNIT.
3. GEOPROBE LOCATIONS ARE FROM MAY THROUGH JULY 1998.
4. APPROXIMATE EXTENT OF MARSH/WETLAND ESTIMATED FROM SITE TOPOGRAPHIC MAP.
5. LOCATION OF ALL WOODED AREAS NOT SHOWN.

PROJECT: CRAB ORCHARD NWR - PCB O.U.
MARION, ILLINOIS
PRE-DESIGN WORKPLAN

SHEET TITLE: PROPOSED MONITORING WELL LOCATION AND TOTAL CVOC ISOPLETH MAP UPPER CLAY AND UPPER SAND UNITS - SITES 32/33

DRAWN BY: SIEWERTD	SCALE:	PROJ. NO. 4781.04
CHECKED BY: TEG	1"=200'	FILE NO. 47810416.DWG
APPROVED BY: TEG	DATE PRINTED: MAY 08 2001	FIGURE 6-1
DATE: MARCH 2000		

RMT, INC.
744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923
Madison, WI 53708-8923
Phone: 608/831-4444

Appendix K
Photographs of Pilot Tests

SVE wellhead setup and monitoring points at I-1-2, 10/21/00.

Air sampling with summa canister at I-1-2, 10/21/00.

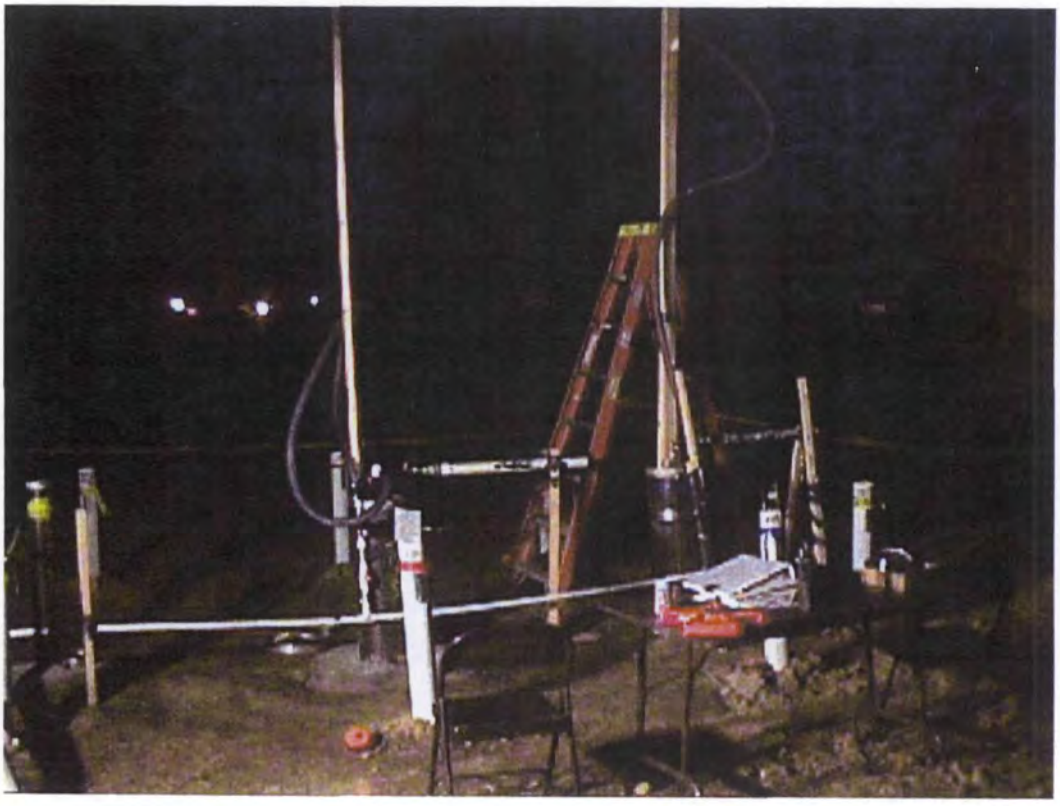
Wellhead of MPE-UC at I-1-23, 10/21/00.

Wellhead instrumentation for MPE, 10/21/00.

Extraction wells and monitoring points at I-1-23, 10/21/00.

SVE connection at I-1-23.

Activated carbon off-gas treatment for the MPE test at I-1-23, 10/21/00.



Night monitoring of the MPE test at I-1-23, 10/21/00.

Appendix L
Pilot Test Well Construction Information

WELL CONSTRUCTION DIAGRAM

AREA: I-1-2

PROJECT:	CONWR				WELL NO.:	MP-1
PROJ. NO:	4781.06	DATE INSTALLED:	10-13-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 3.5 ft. ENE of SVE

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
6.6		RISER PIPE LENGTH
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
		BENTONITE SEAL
	4.1	TOP OF SCREEN
3.0		SCREEN LENGTH
		Filter Pack Material: Unimin Filter Sil #5
	7.1	BOTTOM OF SCREEN
	7.8	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG
		Backfill Material: none
	7.8	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC ½" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC ½" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3¼ In. From 0 To 7.8 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? yes ~~NO~~ KB 4" PVC

2. WELL DEVELOPMENT:

A) Method: dry - no development

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: dry
After:

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

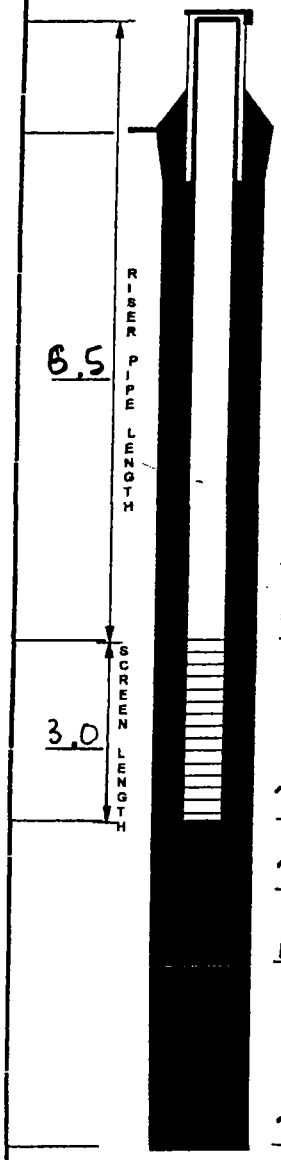
WELL CONSTRUCTION DIAGRAM

AREA: I-1-2

PROJECT:	CONWR				WELL NO.:	MP-2
PROJ. NO:	4781.06	DATE INSTALLED:	10-13-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 7.0 ft. WSW of SVE

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
6.5 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	3.0	BENTONITE SEAL
	4.0	TOP OF SCREEN
3.0 (SCREEN LENGTH)		Filter Pack Material: Unimin Filter Sil #5
	7.0	BOTTOM OF SCREEN
	7.9	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG
		Backfill Material: none
	7.9	HOLE BOTTOM



1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 7.9 Ft.
____ In. From ____ To ____ Ft.

F) Surf. Casing Diameter: N/A In. From ____ To ____ Ft.
2nd Surface Casing: N/A In. From ____ To ____ Ft.

G) Installed Protective Cover W/ Lock? yes ~~NO~~ KB 4" PVC

2. WELL DEVELOPMENT:

A) Method: dry - no development

B) Time Spent Developing: ____ Hours

C) Water Removed: ____ Gallons
Added: ____ Gallons

D) Water Clarity Before/After Development:
Before: dry
After:

F) Odor (Descr. if present) ____

3. WATER LEVEL SUMMARY:

A) After Developing: ____ Ft. Below Top Of Casing

B) Other Date/Time: ____ Ft.
Other Date/Time: ____ Ft.

Notes: expendable tip left at end of boring.

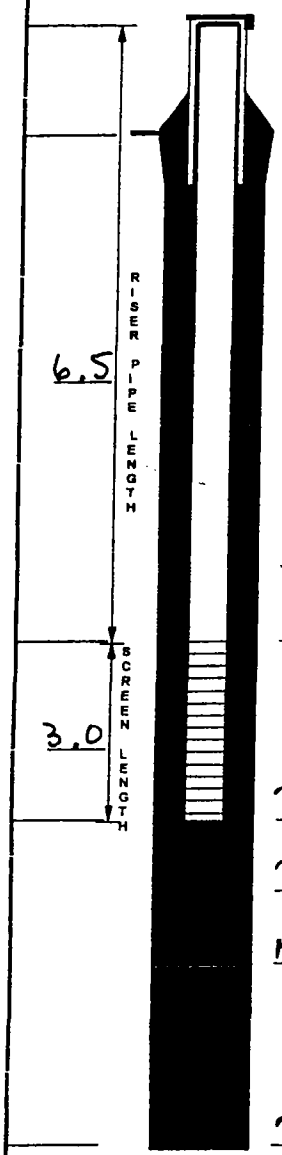
WELL CONSTRUCTION DIAGRAM

AREA: I-1-2

PROJECT:	CONWR					WELL NO.:	MP-3
PROJ. NO:	4781.06	DATE INSTALLED:	10-13-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 14.0 ft. SSE of SVE

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
6.5		RISER PIPE LENGTH
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	3.0	BENTONITE SEAL
	4.0	TOP OF SCREEN
3.0		SCREEN LENGTH
		Filter Pack Material: Unimin Fitter Sil #5
	7.0	BOTTOM OF SCREEN
	7.8	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG
		Backfill Material: none
	7.8	HOLE BOTTOM



1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC ½" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC ½" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3¼ In. From 0 To 7.8 Ft.
____ In. From ____ To ____ Ft.

F) Surf. Casing Diameter: N/A In. From ____ To ____ Ft.
2nd Surface Casing: N/A In. From ____ To ____ Ft.

G) Installed Protective Cover W/ Lock? yes ~~NO~~ 4" PVC

2. WELL DEVELOPMENT:

A) Method: dry - no development

B) Time Spent Developing: ____ Hours

C) Water Removed: ____ Gallons
Added: ____ Gallons

D) Water Clarity Before/After Development:
Before: dry
After:

F) Odor (Descr. if present) ____

3. WATER LEVEL SUMMARY:

A) After Developing: ____ Ft. Below Top Of Casing

B) Other Date/Time: ____ Ft.
Other Date/Time: ____ Ft.

Notes: expendable tip left at end of boring.

RMT Field Soil Boring Log Information

RMT Project No: 4781.06

Project Name	Start Date	End Date	Boring Number
CRAB ORCHARD NWR	27 Sept. 00	27 Sept. 00	I-1-25VE

Boring Drilled By	Drilling Method
MATECO / Bob Dreyer	HSA/wash Rotary

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
CME-750 HT	I-1-25VE			8/6 Inches

Boring Location State Plane: Easting / Northing; 1/4 of 1/4 of Section T N,R

Local Grid Location (If applicable): Feet ☐ N ☐ S; Feet ☐ E ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
	IL		Marion

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
				Blind drill to 6 feet					
				4¼-in ID HSA to 3 feet - Drive 6-in. ID Steel casing to 4 feet.					
			2	1 bag (50lbs) hole plug in annulus					
				used Markel E-Z Break Copper Grade on pipe threads.					
			4						
			6	Pushed Shelby waiting 15 mins for clay to swell					
1525 1	2/6	NA		Clay in bottom, a little sand in top					Shelby Tube
			8						
			10						
				End of Boring @ 10.5 Feet					
				Hole caved to 9-feet - Drilled past - tried for 10 feet - went to 10.5 feet, hole stayed open.					

Logged By: Craig O. Bartholomew

Checked By:

F-204B (R 12-94)

6

RMT Field Soil Boring Log Information

RMT Project No: 4781.06

Project Name	Start Date	End Date	Boring Number
CRAB ORCHARD NWR	30 Oct 00	30 Oct 00	I-1-23 MPE-UC US COD

Boring Drilled By	Drilling Method
MATECO / Bob Dreyer	HSA/Wash Rotary MPØC

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
CME-750HT	I-1-23 MPE-UC			12/6 Inches

Boring Location
State Plane Easting Northing
1/4 of 1/4 of Section T N,R

Local Grid Location (If applicable)
☐ N ☐ E
Feet ☐ S Feet ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
	IL		Marion

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
				8¼" HSA to 27'					
				6" Casing Drivet Wash rotary COD from 29'					
			10						
			20						
			30						
I	30	NA		Sand (SM) in bottom and top					Shelby
			40						
				Total Depth - 40.5 feet					
			45						

Logged By: Craig O'Bauldamu

Checked By:

F-204B (R 12-94)

7

RMT Field Soil Boring Log Information

RMT Project No: 4781.06

Project Name	Start Date	End Date	Boring Number
CRAB ORCHARD NWR	20ct00	20ct.00	I-1-23 SVE

Boring Drilled By	Drilling Method
MATECO / Bob Dreyer	Wash Rotary

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
CME-750 HT	I-1-23 SVE			6 Inches

Boring Location State Plane: Easting: Northing: 1/4 of: 1/4 of Section: T: N,R:

Local Grid Location (If applicable): Feet ☐ N ☐ S Feet ☐ E ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
	IL		Marion

	Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
1020					Drove 6-in ID steel casing to 4 feet					
				2						
				4						
1300					Clay (CL) gray.					
	1	24	NA	6						Shelby 5.25-7..
				8						
1323				10	End of Boring @ 10 Feet					

Logged By: Craig D. Bartholomew

Checked By:

F-2048 (R 12/94)

8

RMT Field Soil Boring Log Information

RMT Project No: 4781.06

Project Name	Start Date	End Date	Boring Number
CRAB ORCHARD NWR	10-2-00	10-2-00	MPE-UC & MPØB

Boring Drilled By	Drilling Method
MATECO/Bob Dreyer	HSA/Wash Rotary

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
CME-750HT	MPE-UC			12/8 Inches

Boring Location State Plane: Easting: Northing: 1/4 of 1/4 of Section T N,R

Local Grid Location (If applicable): Feet ☐ N ☐ S Feet ☐ E ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
	IL		Marion

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
				8¼-ID HSA to 11'					
				8-in Wash rotary from 11'					
			5						
			10						
				Blind					
1	30"	NA	15	Slope in top (~6") Tan clay (CL) in bottom					1525 Shelby
				End of Boring 18.5 Feet					
			20						
			25						

Logged By: Craig O'Bar Wolan

Checked By:

F-204B (R 12-94)

9

WELL CONSTRUCTION DIAGRAM

PROJECT:	CONWR					WELL NO.:	MPE-UC1 MP-06
PROJ. NO:	4781.06	DATE INSTALLED:	10-1-00	OBSV. BY:	COB	CHECKED BY:	

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)
	____ TOP OF CASING
	____ GROUND
	____ CEMENT SURFACE PLUG
	Grout/Backfill Material: Volclay
	Grout/Backfill Method: Tremie-pump 100 lbs CDB/gal - 75 lbs
	29 GROUT
	Bentonite Seal Material: Pure Gold 200 lbs
	34 BENTONITE SEAL
	35.2 TOP OF SCREEN
	Filter Pack Material: Filter Sil #5
	40 BOTTOM OF SCREEN
	40.5 BOTTOM OF FILTER PACK
	None BENTONITE PLUG
	Backfill Material: ~~40~~ CDB Cave-in
	40.5 HOLE BOTTOM

4" = 39.48 RISER PIPE LENGTH
40 CDB
½" = 39'
4" = 5' SCREEN LENGTH
½" = 3'

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC — Pipe Schedule: 40 for 4-in, 80 for ½-in

B) Pipe Joints: 4" = Flush-thread + ½" = Glued

C) Solvent Used? PVC Glue.

D) Screen Type: 4" = wirewrap, ½-in = continuous slot — Screen Slot Size: 0.01" - Both

E) Borehole Diameter: 12 In. From 0 To 34 Ft.
8 In. From 34 To 40.5 Ft.

F) Surf. Casing Diameter: ____ In. From ____ To ____ Ft.
2nd Surface Casing: ____ In. From ____ To ____ Ft.

G) Installed Protective Cover W/ Lock? yes

2. WELL DEVELOPMENT: 10/2/00

A) Method: Surge & Pump

B) Time Spent Developing: WL initial - 7' 3 Hours

C) Water Removed: 40 Gallons
Added: 1.5 Gallons

D) Water Clarity Before/After Development:
Before: Brown - vy turbid
After: Clear

F) Odor (Descr. if present) None

3. WATER LEVEL SUMMARY:

A) After Developing: 42.16 Ft. Below Top Of Casing

B) Other Date/Time: ____ Ft.
Other Date/Time: ____ Ft.

Notes:

Oct 10 00 12:10p RMT Employee 618-997-6166 p.13

WELL CONSTRUCTION DIAGRAM

PROJECT:	CONWR					WELL NO.:	Final Repository MPE-US & MPØA
PROJ. NO:	4781.06	DATE INSTALLED:	9/29/00	OBSV BY:	COB	CHECKED BY:	

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)
	TOP OF CASING
	GROUND
	2 CEMENT SURFACE PLUG
	Grout/Backfill Material: Volclay/hole Plug
	Grout/Backfill Method: Tremmie Pump
33.8 (RISER PIPE LENGTH)	24 GROUT
	Bentonite Seal Material: 75 lbs Pure Gold
	28'9" BENTONITE SEAL
	30.8 TOP OF SCREEN
1 (SCREEN LENGTH)	Filter Pack Material: Filter Sil #5 50 lbs
	31.8 BOTTOM OF SCREEN
	31.8 BOTTOM OF FILTER PACK
	None BENTONITE PLUG
	Backfill Material: None (caved)
	32.5 HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC — Pipe Schedule: 40 - 4" ID; 80 - ½" ID

B) Pipe Joints: Flush-thread - 4" & Glued ½"

C) Solvent Used? PVC Glue - ½"

D) Screen Type: Wire wrap - 4" & continuous slot - ½" — Screen Slot Size: 0.01" - Both

E) Borehole Diameter: 12 In. From 0 To 29 Ft.; 8 In. From 29 To 32.5 Ft.

F) Surf. Casing Diameter: ____ In. From ____ To ____ Ft.
2nd Surface Casing: ____ In. From ____ To ____ Ft.

G) Installed Protective Cover W/ Lock? yes

2. WELL DEVELOPMENT:

A) Method: Surged & Pumped

B) Time Spent Developing: 3 Hours

C) Water Removed: 50.0 Gallons
Added: 0.0 Gallons

D) Water Clarity Before/After Development:
Before: Brown - Turbid
After: Clear

F) Odor (Descr. if present) None

3. WATER LEVEL SUMMARY:

A) After Developing: 22.6 Ft. Below Top Of Casing (recovered level)

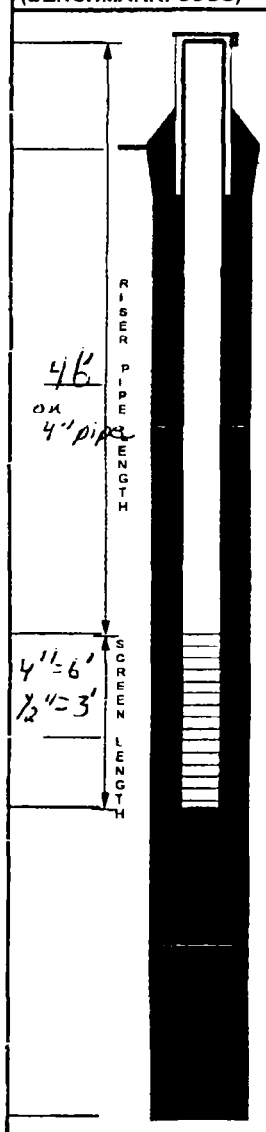
B) Other Date/Time: ____ Ft.
Other Date/Time: ____ Ft.

Notes: Installed 4-in. & ½-in. in same hole

WELL CONSTRUCTION DIAGRAM

PROJECT:	CONWR					WELL NO.:	UC2 MPE-~~U521~~ MPOC COB
PROJ. NO:	4781.06	DATE INSTALLED:	30 Sep 00	OBSV. BY:	COB	CHECKED BY:	

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)



TOP OF CASING

GROUND

CEMENT SURFACE PLUG

Grout/Backfill Material: Vol Clay 150 Gals

Grout/Backfill Method: Tremmie-Pump

35.9 GROUT

Bentonite Seal Material: Pure Gold 200 lbs

41.9' BENTONITE SEAL

43' for 4" ID & 44.5 for ½" TOP OF SCREEN

Filter Pack Material: Filter Sand #5

49' for 4" & 48.5' for ½" BOTTOM OF SCREEN

48.0 BOTTOM OF FILTER PACK

None BENTONITE PLUG

Backfill Material: None - Bailing

49.5 HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC Pipe Schedule: 40 - 4" ID, 80 - ½" ID

B) Pipe Joints. 4" = Flush-thread & ½" = Glued

C) Solvent Used? PVC Glue

D) Screen Type: 4" = Wire wrap; ½" = continuous Slot Screen Slot Size: 0.01 - both

E) Borehole Diameter: ~~Case~~ 12 In. From 0 To 41 Ft.
8 In. From 41 To 48.5 Ft.

F) Surf. Casing Diameter: ____ In. From ____ To ____ Ft.
2nd Surface Casing: ____ In. From ____ To ____ Ft.

G) Installed Protective Cover W/ Lock? yes

10-1/10-2

2. WELL DEVELOPMENT: TD = 50.1 ft

A) Method: Surged & Pumped

B) Time Spent Developing: 2 Hours

C) Water Removed: 50 Gallons
Added: 20 Gallons

Initial WL = 24.6

D) Water Clarity Before/After Development:
Before: Turbid Brown
After: Turbid rusty - No particles - Clay - 2 cons. size

F) Odor (Descr. if present) None

3. WATER LEVEL SUMMARY:

A) After Developing: 51.6 Ft. Below Top Of Casing

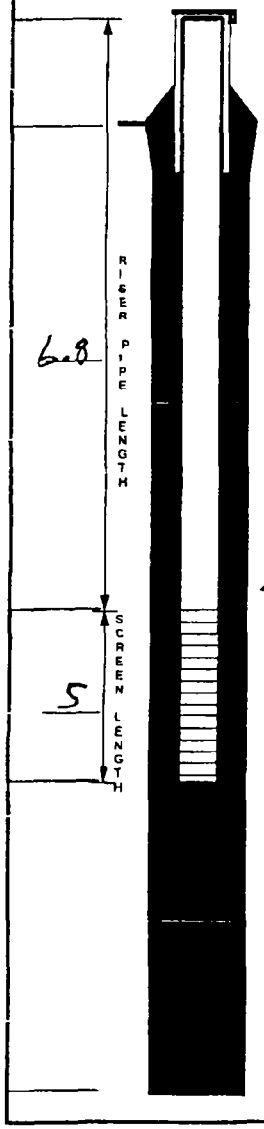
B) Other Date/Time: None Ft.
Other Date/Time: ____ Ft.

Notes:

WELL CONSTRUCTION DIAGRAM

PROJECT:	CONWR				WELL NO.:	I-1-23SVE
PROJ. NO:	4781.06	DATE INSTALLED:	10/2/00	OBSV. BY: COB	CHECKED BY:	

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)



	TOP OF CASING
	GROUND
0.5'	CEMENT SURFACE PLUG
	Grout/Backfill Material:
	Grout/Backfill Method:
None	GROUT
	Bentonite Seal Material: Pure Gold 50 lbs
3	BENTONITE SEAL
~~8~~ 3'10" COB	TOP OF SCREEN
	Filter Pack Material: Filter Sil #5 100 lbs
~~8~~ 8'10"	BOTTOM OF SCREEN
10	BOTTOM OF FILTER PACK
None	BENTONITE PLUG
	Backfill Material: None
10	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: 2-in. ID PVC — Pipe Schedule: 40

B) Pipe Joints: Flush Threaded

C) Solvent Used? None

D) Screen Type: Johnson Wire Wrap PVC — Screen Slot Size: 0.01-inch

E) Borehole Diameter: 6 In. From 0 To 10 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: ___ In. From ___ To ___ Ft.
2nd Surface Casing: ___ In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? ~~yes~~

2. WELL DEVELOPMENT:

A) Method: Surge & Pump

B) Time Spent Developing: 2 Hours

C) Water Removed: 24 Gallons
Added: 5 Gallons

D) Water Clarity Before/After Development:
Before: Turbid Brown
After: Slight turbidity

F) Odor (Descr. if present) None

recovers about 1-gal every 15 mins.

3. WATER LEVEL SUMMARY:

A) After Developing: 10 Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

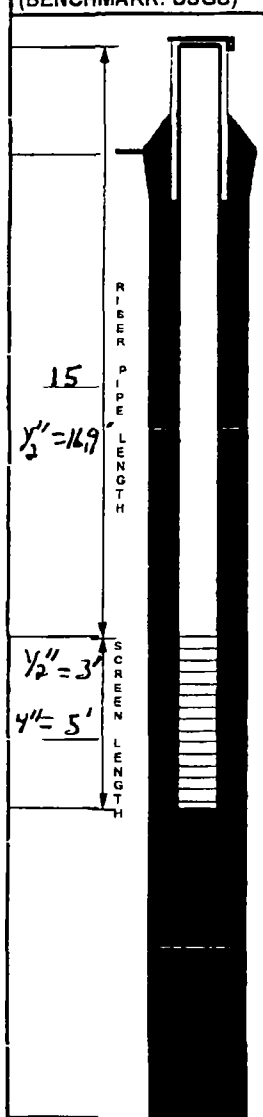
Notes:

WELL CONSTRUCTION DIAGRAM

Prelim

PROJECT:	CONWR					WELL NO.:	I-1-23 MPS-UC + MPQB
PROJ. NO:	4781.06	DATE INSTALLED:	10/2/00	OBSV. BY:	COB	CHECKED BY:	

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)



TOP OF CASING

GROUND

CEMENT SURFACE PLUG

Grout/Backfill Material: Volclay & Pure Gold

Grout/Backfill Method: Tremmie Pump 10 Gals, 15 lbs

6' GROUT

Bentonite Seal Material: Pure Gold 200 lbs

11 BENTONITE SEAL

½"=14.75'

13 TOP OF SCREEN

Filter Pack Material: Filter Sil #5 100 lbs

½"=17.75'

18 BOTTOM OF SCREEN

18.2 BOTTOM OF FILTER PACK

None BENTONITE PLUG

Backfill Material: Caved

18.5 HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC — Pipe Schedule: 40 - 4-in, 80 - ½-in

B) Pipe Joints: 4-in flush thread, ½-in Glued

C) Solvent Used? PVC Glue

D) Screen Type: Johnson wire wrap - 4" & continuous slot - ½" — Screen Slot Size: 0.01" - Both

E) Borehole Diameter: 12 In. From 0 To 11 Ft.; 8 In. From 11 To 18.5 Ft.

F) Surf. Casing Diameter: ___ In. From ___ To ___ Ft.

2nd Surface Casing: ___ In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? yes

2. WELL DEVELOPMENT: 30 Oct 00

A) Method: Pump & Surge

B) Time Spent Developing: 2 Hours

C) Water Removed: 50 Gallons

Added: 0.0 Gallons

TD = 20.4' BTC

D) Water Clarity Before/After Development:

Before: Brown & Turbid

After: Clear to Slight turbidity

F) Odor (Descr. if present) None

Pre Dev. WL = 2' BTC

3. WATER LEVEL SUMMARY:

A) After Developing: 14.9 Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.

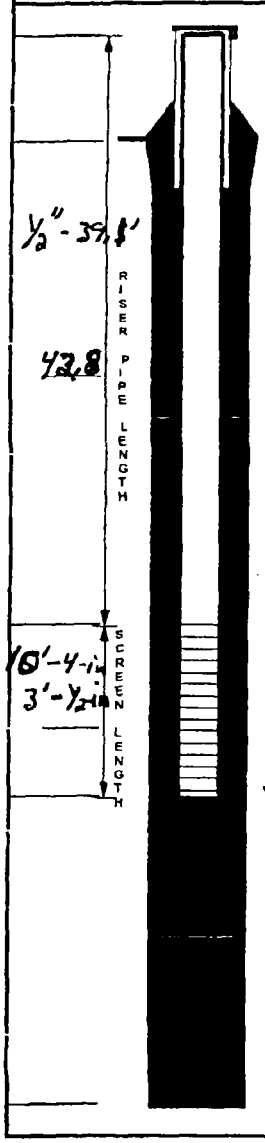
Other Date/Time: ___ Ft.

Notes: Set both ½" & 4" casings in same hole. The 4-in wire wrap screen was cut to length & a PVC cap was glued on.

WELL CONSTRUCTION DIAGRAM

PROJECT:	CONOR					WELL NO.:	I-1-23 MPE- USE MPBC
PROJ. NO:	4786.06	DATE INSTALLED:	10-3-00	OBSV. BY:	COB	CHECKED BY:	

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)



TOP OF CASING

GROUND

CEMENT SURFACE PLUG

Grout/Backfill Material: Volclay & Pure Gold

Grout/Backfill Method: Tremmie Pump 45gals - 60lbs

20.5' GROUT

Bentonite Seal Material: Pure Gold 150lbs

27'11" BENTONITE SEAL

½" @ 36'9"

29'9" TOP OF SCREEN

Filter Pack Material: Filter Sil #5 200lbs

39'9" BOTTOM OF SCREEN

39'9" BOTTOM OF FILTER PACK

None BENTONITE PLUG

Backfill Material: Caved

40.5 HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC Pipe Schedule: 40-4-in / 80-½-in

B) Pipe Joints: Threaded Flush-4in / Glued-½in

C) Solvent Used? PVC Glue

D) Screen Type: Johnson wirewrap-4in / continuous Slot-½-in Screen Slot Size: 0.01-in

E) Borehole Diameter: 12 In. From 0 To 29 Ft.
6 In. From 29 To 40.5 Ft.

F) Surf. Casing Diameter: ___ In. From ___ To ___ Ft.
2nd Surface Casing: ___ In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? yes

2. WELL DEVELOPMENT:

A) Method: Surge & Pump
Pre Dev WL = 12.3'

B) Time Spent Developing: 1.3 Hours

C) Water Removed: 250 Gallons
Added: 0.0 Gallons

D) Water Clarity Before/After Development:
Before: Turbid Brown
After: Clear
Produces ~ 5GPM

F) Odor (Descr. if present) None

3. WATER LEVEL SUMMARY:

A) After Developing: 16.92 Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

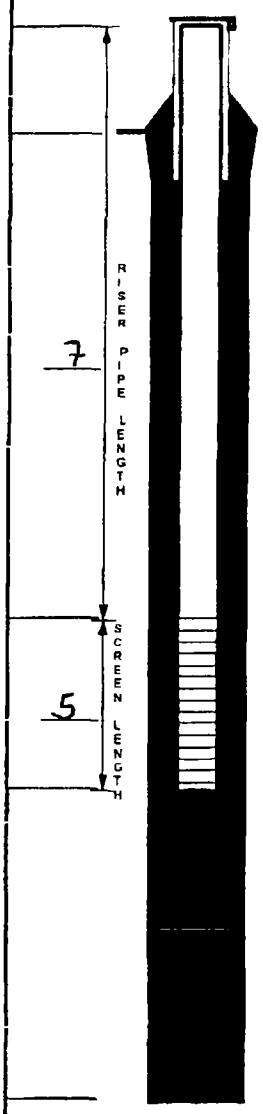
Notes: Installed both screens in same hole at same bottom depth. Had trouble with clay plug in bottom of casing (steel drive casing) during installation. Checked ½" pipe with WL indicator prior to pouring sand pack - ½ casing open to bottom - undamaged.

WELL CONSTRUCTION DIAGRAM

Final

PROJECT:	CRAB ORCHARD NWR					WELL NO.:	I-1-2 SVE
PROJ. NO:	4781.06	DATE INSTALLED:	9/27/00	OBSV. BY:	COB	CHECKED BY:	

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW CR ABOVE GROUND (FT.)



____	TOP OF CASING
____	GROUND
0.5	CEMENT SURFACE PLUG (Concrete Pad)
	Grout/Backfill Material:
	Grout/Backfill Method:
None	GROUT
	Bentonite Seal Material: Pure Gold
2	BENTONITE SEAL To surface 50 lbs.
4	TOP OF SCREEN
	Filter Pack Material: Filter Sil #5 100 lbs.
9.0	BOTTOM OF SCREEN
10.5	BOTTOM OF FILTER PACK
None	BENTONITE PLUG
	Backfill Material: None
10.5	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 2-in. ID — Pipe Schedule: 40

B) Pipe Joints: Threaded/Flush

C) Solvent Used? None

D) Screen Type: Johnson Wire-wrap 2-in. ID — Screen Slot Size: 0.01-in.

E) Borehole Diameter: 8 In. From 0 To 3 Ft.
6 In. From 3 To 10.5 Ft.

F) Surf. Casing Diameter: 6 In. From 0 To 4 Ft. removed
2nd Surface Casing: ____ In. From ____ To ____ Ft.

G) Installed Protective Cover W/ Lock? yes

2. WELL DEVELOPMENT: 10-1-00

A) Method: Surge + Pump

B) Time Spent Developing: 2.5 Hours

C) Water Removed: 11 Gallons
Added: 9 Gallons
Surged for 5 minutes / 3 times

D) Water Clarity Before/After Development:
Before: Brown Turbid
After: Clear

F) Odor (Descr. if present) None

3. WATER LEVEL SUMMARY:

A) After Developing: 0.5 Ft. ~~Below Top Of Casing~~ above bottom of well

B) Other Date/Time: ____ Ft.
Other Date/Time: ____ Ft.

Notes:

RMT Field Soil Boring Log Information

Repository

RMT Project No: 4781.06

Project Name	Start Date	End Date	Boring Number
CRAB ORCHARD NWR	28 Sept 00	29 Sept 00	Repository MPE-US & MPØA

Boring Drilled By	Drilling Method
MATECO / Bob Dreyer	HSA / Wash Rotary

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
CME-750 HT	MPE-US			12/8 Inches

Boring Location State Plane: Easting: Northing: 1/4 of: 1/4 of Section: T: N,R: Local Grid Location (If applicable): ☐ N ☐ S Feet ☐ E ☐ W Feet

County	State	DNR County Code	Civil Town/City/ or Village
	IL		Marion

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
				Blind Drill HSA to 29 feet					
				Wash Rotary to 32.5 feet					
			5						
			10						
			15						
			20						
			25						
				1420 - 8¼-in HSA @ 29 feet BLS					
			30	1530 - Pulled HSA to 28.5 feet, 1600 Rotary @ 29.2 feet					
1645 1	30	NA		Brown SM in top - Looks like fill, Native SM - fine in bottom					Shelby 30-325
			35	End of Boring at 32.5 Feet					

Logged By: Craig O. Bartholomew

Checked By:

F-2048 (R 12-94)

OCT 10 00 12:09p RMT Employee 618-997-6166 p.10

RMT

WELL CONSTRUCTION DIAGRAM

AREA: I-1-23

PROJECT:	CONWR				WELL NO.:	MP-1A
PROJ. NO:	4781.06	DATE INSTALLED:	10-10-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 3.5 ft. NNE of SVE

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
7.3 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	3.5	BENTONITE SEAL
	4.8	TOP OF SCREEN
3.0 (SCREEN LENGTH)		Filter Pack Material: Unimin Filter Sil #5
	7.8	BOTTOM OF SCREEN
	8.0	BOTTOM OF FILTER PACK
	NA	BENTONITE PLUG
		Backfill Material:
	8.0	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 8.0 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

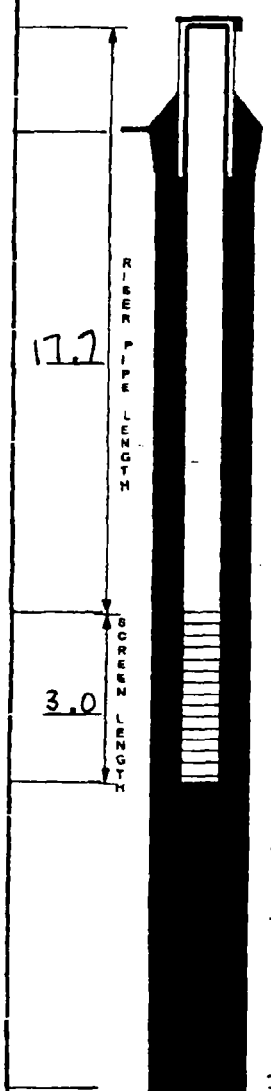
WELL CONSTRUCTION DIAGRAM

AREA: I-1-23

PROJECT:	CONWR					WELL NO.:	MP-1B
PROJ. NO:	4781.06	DATE INSTALLED:	10-10-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 3.5 ft. NNE of MPE-UC

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	13.0	BENTONITE SEAL
	15.2	TOP OF SCREEN
		Filter Pack Material: Unimin Filter Sil #5
	18.2	BOTTOM OF SCREEN
	18.4	BOTTOM OF FILTER PACK
	NA	BENTONITE PLUG
		Backfill Material: none
	~~18.8~~ 18.4'	HOLE BOTTOM



1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 18.4 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

WELL CONSTRUCTION DIAGRAM

AREA: I-1-23

PROJECT:	A1 (KG) CONWR				WELL NO.:	MP-1C
PROJ. NO:	4781.06	DATE INSTALLED:	10-10-00	OBSV. BY: KBaker	CHECKED BY:	

located 3.5' NNE of I-1-23 MPE-US

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold bentonite
		Grout/Backfill Method: gravity
39.3 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold® bentonite
	32.0'	BENTONITE SEAL natural collapse
	36'9"	TOP OF SCREEN
3.0' (SCREEN LENGTH)		Filter Pack Material: ~~Unimin Filter Sand~~ ~~#5~~ natural collapse
	39'9"	BOTTOM OF SCREEN
	41.0	BOTTOM OF FILTER PACK
	NA	BENTONITE PLUG
		Backfill Material: NA
	41.0	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC — Pipe Schedule: 80

B) Pipe Joints: glued

C) Solvent Used? PVC Glue

D) Screen Type: continuous slot — Screen Slot Size: 0.01"

E) Borehole Diameter: 3 1/4 In. From 0 To 41.0 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? ___

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left in borehole at end of boring.

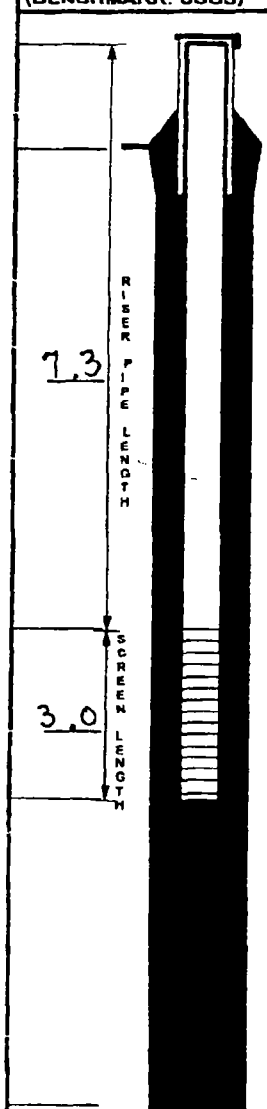
WELL CONSTRUCTION DIAGRAM

AREA: I-1-23

PROJECT:	CONWR					WELL NO.:	MP-2A
PROJ. NO:	4781.06	DATE INSTALLED:	10-11-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 7.0 ft. SSW of SVE

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	3.9	BENTONITE SEAL
	4.8	TOP OF SCREEN
		Filter Pack Material: Unimin Filter Sil #5
	7.8	BOTTOM OF SCREEN
	8.6	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG
		Backfill Material: none
	8.6	HOLE BOTTOM



1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 8.8 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

WELL CONSTRUCTION DIAGRAM

AREA: I-1-23

PROJECT:	CONWR					WELL NO.:	MP-2B
PROJ. NO:	4781.06	DATE INSTALLED:	10-11-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 7.0 ft. SSW of MPE-UC

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
17.3 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	13.5	BENTONITE SEAL
	14.8	TOP OF SCREEN
3.0 (SCREEN LENGTH)		Filter Pack Material: Unimin Filter Sil #5
	17.8	BOTTOM OF SCREEN
	18.8	BOTTOM OF FILTER PACK
	NA	BENTONITE PLUG
		Backfill Material: none
	18.8	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC ½" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC ½" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3¼ In. From 0 To 18.8 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

WELL CONSTRUCTION DIAGRAM

AREA: I-1-23 KB

PROJECT:	CONWR					WELL NO.:	MP-2BC
PROJ. NO:	4781.06	DATE INSTALLED:	10-11-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 7.0 ft. SSW of MPE-US

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
39.1 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	33.2	BENTONITE SEAL
	36.6	TOP OF SCREEN
3.0 (SCREEN LENGTH)		Filter Pack Material: ~~Unimin Filter Sil #5~~ natural collapse KB
	39.6	BOTTOM OF SCREEN
	40.4	BOTTOM OF FILTER PACK
	NA	BENTONITE PLUG
		Backfill Material: none
	40.4	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 40.4 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

WELL CONSTRUCTION DIAGRAM

AREA: I-2-23

PROJECT:	CONWR					WELL NO.:	MP-3A
PROJ. NO:	4781.06	DATE INSTALLED:	10-11-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 14.0 ft. WNW of SVE

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
7.3 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	3.9	BENTONITE SEAL
	4.8	TOP OF SCREEN
3.0 (SCREEN LENGTH)		Filter Pack Material: Unimin Filter Sil #5
	7.8	BOTTOM OF SCREEN
	8.7	BOTTOM OF FILTER PACK
	NA	BENTONITE PLUG
		Backfill Material: none
	8.7	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 8.7 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

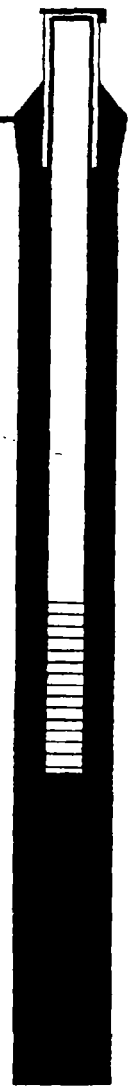
WELL CONSTRUCTION DIAGRAM

AREA: I-1-23

PROJECT:	CONWR					WELL NO.:	MP-3B
PROJ. NO:	4781.06	DATE INSTALLED:	10-11-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 14.0 ft. WNW of MPE-UC

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
17.3 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	12.6	BENTONITE SEAL
	14.8	TOP OF SCREEN
3.0 (SCREEN LENGTH)		Filter Pack Material: Unimin Filter Sil #5
	17.8	BOTTOM OF SCREEN
	18.7	BOTTOM OF FILTER PACK
	NA	BENTONITE PLUG
		Backfill Material: none
	18.7	HOLE BOTTOM



1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 18.7 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

WELL CONSTRUCTION DIAGRAM

AREA: I-1-23

PROJECT:	CONWR				WELL NO.:	MP-3C
PROJ. NO:	4781.06	DATE INSTALLED:	10-10-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 14.0 ft. WNW of MPE-US

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
39.1 (RISER PIPE LENGTH)		
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	~~34.0~~ 33.0	BENTONITE SEAL
	36.6	TOP OF SCREEN
3.0 (SCREEN LENGTH)		
		Filter Pack Material: ~~Unimin Filter Sil #5~~ natural collapse
	39.6	BOTTOM OF SCREEN
	40.3	BOTTOM OF FILTER PACK
	NA	BENTONITE PLUG
		Backfill Material: collapse
	40.5	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC ½" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC ½" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3¼ In. From 0 To 40.5 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

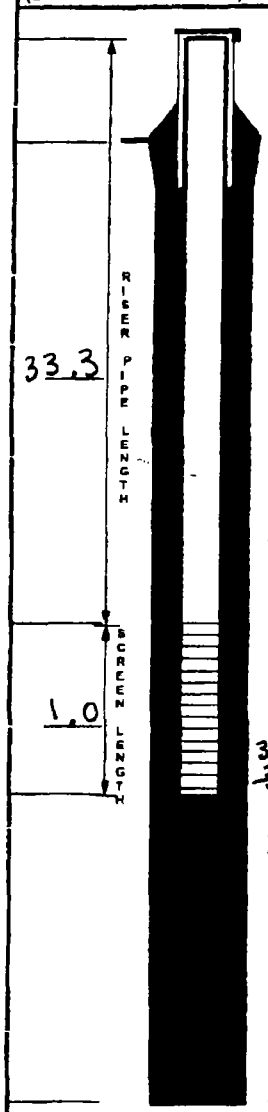
WELL CONSTRUCTION DIAGRAM

AREA: REPOSITORY

PROJECT:	CONWR				WELL NO.:	MP-1A
PROJ. NO:	4781.06	DATE INSTALLED:	10-12-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 3.5 ft. NE of MPE-US

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	26.0	BENTONITE SEAL
	30.8	TOP OF SCREEN
		Filter Pack Material: Unimin Filter Sil #5
	31.8 ~~30.8~~ KO	BOTTOM OF SCREEN
	31.0	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG natural collapse to 31.0' bgs
		Backfill Material: none
	32.2	HOLE BOTTOM



1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 32.2 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

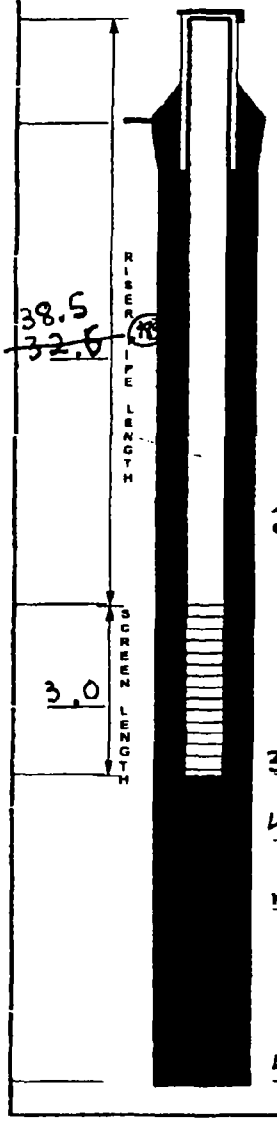
WELL CONSTRUCTION DIAGRAM

AREA: REPOSITORY

PROJECT:	CONWR					WELL NO.:	MP-1B
PROJ. NO:	4781.06	DATE INSTALLED:	10-12-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 3.5 ft. NE of MPE-UC1

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)
	2.5 TOP OF CASING
	GROUND
	NA CEMENT SURFACE PLUG
	Grout/Backfill Material: Pure Gold® bentonite med. chips
	Grout/Backfill Method: gravity
	NA GROUT
	Bentonite Seal Material: Pure Gold bentonite med. chips
	29.9 BENTONITE SEAL
	36.0 TOP OF SCREEN
	Filter Pack Material: ~~Unimin Filter Sil #5~~ natural collapse
	39.0 BOTTOM OF SCREEN
	40.0 BOTTOM OF FILTER PACK
	N/A BENTONITE PLUG
	Backfill Mater al. none
	40.0 HOLE BOTTOM



1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 40.0 Ft.
____ In. From ____ To ____ Ft.

F) Surf. Casing Diameter: N/A In. From ____ To ____ Ft.
2nd Surface Casing: N/A In. From ____ To ____ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ____

B) Time Spent Developing: ____ Hours

C) Water Removed: ____ Gallons
Added: ____ Gallons

D) Water Clarity Before/After Development:
Before: ____
After: ____

F) Odor (Descr. if present) ____

3. WATER LEVEL SUMMARY:

A) After Developing: ____ Ft. Below Top Of Casing

B) Other Date/Time: ____ Ft.
Other Date/Time: ____ Ft.

Notes: expendable tip left at end of boring.

RMT

WELL CONSTRUCTION DIAGRAM

AREA: REPOSITORY

PROJECT:	CONWR				WELL NO.:	MP-1C
PROJ. NO:	4781.06	DATE INSTALLED:	10-12-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 3.5 ft. NE of MPE-UC2

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
47.0		RISER PIPE LENGTH
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	41.8	BENTONITE SEAL
	44.5	TOP OF SCREEN
3.0		SCREEN LENGTH
		Filter Pack Material: ~~Unimin Filter Sil #5~~ natural collapse
	47.5	BOTTOM OF SCREEN
	~~47.5~~ 48.0	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG
		Backfill Material: none
	48.0	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 48.0 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

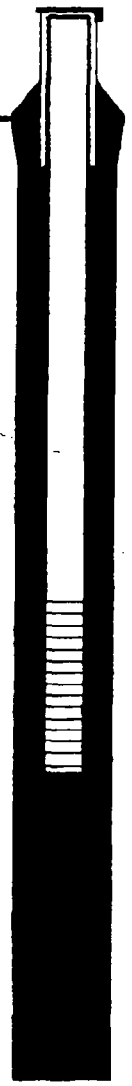
WELL CONSTRUCTION DIAGRAM

AREA: REPOSITORY

PROJECT:	CONWR					WELL NO.:	MP-2A
PROJ. NO:	4781.06	DATE INSTALLED:	10-13-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 7.0 ft. SW of MPE-US

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
33.3		RISER PIPE LENGTH
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	28.9	BENTONITE SEAL
	30.8	TOP OF SCREEN
		Filter Pack Material: Unimin Filter Sil #5
1.0		SCREEN LENGTH
	31.8	BOTTOM OF SCREEN
	32.0	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG
		Backfill Material: none
	32.0	HOLE BOTTOM



1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To ____ Ft.
____ In. From ____ To ____ Ft.

F) Surf. Casing Diameter: N/A In. From ____ To ____ Ft.
2nd Surface Casing: N/A In. From ____ To ____ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ____

B) Time Spent Developing: ____ Hours

C) Water Removed: ____ Gallons
Added: ____ Gallons

D) Water Clarity Before/After Development:
Before: ____
After: ____

F) Odor (Descr. if present) ____

3. WATER LEVEL SUMMARY:

A) After Developing: ____ Ft. Below Top Of Casing

B) Other Date/Time: ____ Ft.
Other Date/Time: ____ Ft.

Notes: expendable tip left at end of boring.

RMT

WELL CONSTRUCTION DIAGRAM

AREA: REPOSITORY

PROJECT:	CONWR					WELL NO.:	MP-2B
PROJ. NO:	4781.06	DATE INSTALLED:	10-13-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 7.0 ft. SW of MPE-UC1

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
	___	GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
38.5 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	34.5	BENTONITE SEAL
	36.0	TOP OF SCREEN
3.0 (SCREEN LENGTH)		Filter Pack Material: Unimin Filter Sil #5
	39.0	BOTTOM OF SCREEN
	~~36.8~~ (R)	BOTTOM OF FILTER PACK natural collapse to 36.8
	N/A	BENTONITE PLUG
		Backfill Material: none
	40.0	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 40.0 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring. Sand locked measuring tape in hole.

WELL CONSTRUCTION DIAGRAM

AREA: REPOSITORY

PROJECT:	CONWR				WELL NO.:	MP-2C
PROJ. NO:	4781.06	DATE INSTALLED:	10-11-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 7.0 ft. SW of MPE-UC2

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	38.0	BENTONITE SEAL
	44.5	TOP OF SCREEN
		Filter Pack Material: ~~Unimin Filter Sil #5~~ natural collapse
	47.5	BOTTOM OF SCREEN
	48.0	BOTTOM OF FILTER PACK
	NA	BENTONITE PLUG
		Backfill Material: none
	48.0	HOLE BOTTOM

RISER PIPE LENGTH

SCREEN LENGTH 3.0

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 48.0 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

WELL CONSTRUCTION DIAGRAM

AREA: REPOSITORY

PROJECT:	CONWR				WELL NO.:	MP-3A
PROJ. NO:	4781.06	DATE INSTALLED:	10-13-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 14.0 ft. NW of MPE-US

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
33.1 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	28.9	BENTONITE SEAL
	30.6	TOP OF SCREEN
1.0 (SCREEN LENGTH)		Filter Pack Material: Unimin Filter Sil #5
	31.6 (KB) ~~31.8~~	BOTTOM OF SCREEN
	31.6	BOTTOM OF FILTER PACK natural collapse
	N/A	BENTONITE PLUG
		Backfill Material: none
	32.0 (KB) ~~39.8~~	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 32.0 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

WELL CONSTRUCTION DIAGRAM

AREA: REPOSITORY

PROJECT:	CONWR					WELL NO.:	MP-3B
PROJ. NO:	4781.06	DATE INSTALLED:	10-13-00	OBSV. BY:	K. BAKER	CHECKED BY:	

located 14.0 ft. NW of MPF-UC1

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
38.5 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	34.0	BENTONITE SEAL
	36.0	TOP OF SCREEN
		Filter Pack Material: Unimin Filter Sil #5
3.0 (SCREEN LENGTH)	39.0	BOTTOM OF SCREEN
	37.1 ~~36.0~~	BOTTOM OF FILTER PACK natural collapse
	NA	BENTONITE PLUG
		Backfill Material:
	40.0	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 40.0 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

WELL CONSTRUCTION DIAGRAM

AREA: REPOSITORY

PROJECT:	CONWR				WELL NO.:	MP-3C
PROJ. NO:	4781.06	DATE INSTALLED:	10-12-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 14.0 ft. NW of MPE-UC2

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
46.7 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	41.5	BENTONITE SEAL Unimin Filter Sil #5
	44.2	TOP OF SCREEN 44.0
3.0 (SCREEN LENGTH)		Filter Pack Material: ~~Unimin Filter Sil #5~~ natural collapse
	47.2	BOTTOM OF SCREEN
	48.0	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG
		Backfill Material: none
	48.0	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 48.0 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

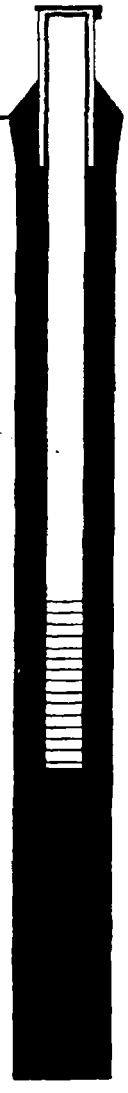
WELL CONSTRUCTION DIAGRAM

AREA: I-1-2

PROJECT:	CONWR				WELL NO.:	MP-3
PROJ. NO:	4781.06	DATE INSTALLED:	10-13-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 14.0 ft. SSE of SVE

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
6.5 (RISER PIPE LENGTH)	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	3.0	BENTONITE SEAL
	4.0	TOP OF SCREEN
3.0 (SCREEN LENGTH)		Filter Pack Material: Unimin Filter Sil #5
	7.0	BOTTOM OF SCREEN
	7.8	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG
		Backfill Material: none
	7.8	HOLE BOTTOM



1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC 1/2" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC 1/2" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3 1/4 In. From 0 To 7.8 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

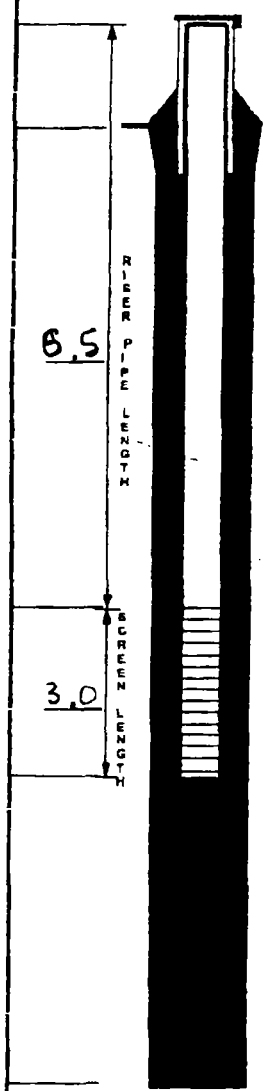
WELL CONSTRUCTION DIAGRAM

AREA: I-1-2

PROJECT:	CONWR				WELL NO.:	MP-2
PROJ. NO:	4781.06	DATE INSTALLED:	10-13-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 7.0 ft. WSW of SVE

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
6.5		RISER PIPE LENGTH
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
	3.0	BENTONITE SEAL
	4.0	TOP OF SCREEN
		Filter Pack Material: Unimin Filter Sil #5
3.0		SCREEN LENGTH
	7.0	BOTTOM OF SCREEN
	7.9	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG
		Backfill Material: none
	7.9	HOLE BOTTOM



1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC ½" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC ½" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3¼ In. From 0 To 7.9 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT

WELL CONSTRUCTION DIAGRAM

AREA: I-1-2

PROJECT:	CONWR				WELL NO.:	MP-1
PROJ. NO:	4781.06	DATE INSTALLED:	10-13-00	OBSV. BY: K. BAKER	CHECKED BY:	

located 3.5 ft. ENE of SVE

ELEVATION (BENCHMARK: USGS)	DISTANCE BELOW OR ABOVE GROUND (FT.)	
	2.5	TOP OF CASING
		GROUND
	NA	CEMENT SURFACE PLUG
		Grout/Backfill Material: Pure Gold® bentonite med. chips
		Grout/Backfill Method: gravity
6.6		RISER PIPE LENGTH
	NA	GROUT
		Bentonite Seal Material: Pure Gold bentonite med. chips
		BENTONITE SEAL
	4.1	TOP OF SCREEN
3.0		SCREEN LENGTH
		Filter Pack Material: Unimin Filter Sil #5
	7.1	BOTTOM OF SCREEN
	7.8	BOTTOM OF FILTER PACK
	N/A	BENTONITE PLUG
		Backfill Material: none
	7.8	HOLE BOTTOM

1. CASING AND SCREEN DETAILS:

A) Type Of Pipe: PVC ½" i.d. Pipe Schedule: 80

B) Pipe Joints: Glued

C) Solvent Used? PVC Glue

D) Screen Type: PVC ½" i.d. continuous slot Screen Slot Size: 0.010"

E) Borehole Diameter: 3¼ In. From 0 To 7.8 Ft.
___ In. From ___ To ___ Ft.

F) Surf. Casing Diameter: N/A In. From ___ To ___ Ft.
2nd Surface Casing: N/A In. From ___ To ___ Ft.

G) Installed Protective Cover W/ Lock? NO

2. WELL DEVELOPMENT:

A) Method: ___

B) Time Spent Developing: ___ Hours

C) Water Removed: ___ Gallons
Added: ___ Gallons

D) Water Clarity Before/After Development:
Before: ___
After: ___

F) Odor (Descr. if present) ___

3. WATER LEVEL SUMMARY:

A) After Developing: ___ Ft. Below Top Of Casing

B) Other Date/Time: ___ Ft.
Other Date/Time: ___ Ft.

Notes: expendable tip left at end of boring.

RMT Field Soil Boring Log Information

RMT Project No: 4781.06

Page 1 of 1

Project Name	Start Date	End Date	Boring Number
CRAB ORCHARD NWR	29 Sept 00	30 sept 00	MPE-U82

Boring Drilled By	Drilling Method
Mateco / Bob Dreyer	HSA / Wash Rotary

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
CME 750 HT	MPE-U82			12/8 Inches

Boring Location State Plane	Easting	Northing	Local Grid Location (If applicable)
1/4 of 1/4 of Section	T N,R		☐ N ☐ S Feet ☐ E ☐ W Feet

County	State	DNR County Code	Civil Town/City/ or Village
	IL		

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
				Blind drill w/8-in ID HSAs To 41 ft.					
			5						
			10						
			15	1515 (9/29/00)					
			20						
			25						
			30						
			35						
			40	1620 (9/29/00)					
1710	30"	NA	45	1704 Clay in bottom - gray till, slop in top					Shelby Tube (45-47ft)
			50	End of Boring 49.5					
				Note: 8 1/4" HSA Blind to 41', 8" wash rotary to 49.5'					

Logged By: Craig O'Bartholomew

Checked By:

F-2048 (R 12-94)

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RMT Field Soil Boring Log Information

Repository

RMT Project No: 4781.06

Page 1 of 1

Project Name	Start Date	End Date	Boring Number
CRAB ORCHARD NWR	Oct 1, 2000	Oct 1, 2000	MPE-UC1 + MPØB

Boring Drilled By	Drilling Method
MATECO/Bob Dreyer	HSA/Wash Rotary

Drill Rig	Common Well Name	Initial Water Level	Surface Elevation	Borehole Diameter
CME-750 HT	MPE-UC1			12/8 Inches

Boring Location State Plane Easting Northing

1/4 of 1/4 of Section T N,R

Local Grid Location (If applicable) ☐ N ☐ E Feet ☐ S Feet ☐ W

County	State	DNR County Code	Civil Town/City/ or Village
	IL		Marion

Number	Length (In) Recovered	Blow Counts	Depth In Feet	Group Name, Percent & Range of Particle Sizes, Plasticity, Color, Odor, Moisture, Density/Consistency, Additional Comments, Geologic Origin (Stratigraphic Unit)	Sample Type	PID/FID	Standard Penetration	Well Diagram	RQD/ Comments
				Blind Drill with HSA (8¼-in ID) to 34 feet Then wash rotary with 8-in tricone					
			10						
			20						
			30						
1050 1	0	NA							Shelby t 36.5-3 + 39.46
1135 2	18	NA	40	Gray Clay (CL) in bottom; slop in top. End of boring 40.5 Feet					
			50						

Logged By: Craig D. Bartholomew

Checked By:

F-2048 (R 12-94)

40/40

Appendix M
Pilot Test Field Data Sheets

MPE – Area 9 Repository

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/17/00 **Weather** 65 & P-cloudy **Name(s):** D. Stewart
Location Repository

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (acfm)	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
10.17.00 / 14:26	0.00	25	9999983				~20 (.13)		150		
14:26										8.6	
15 40	1.2										water sample
1545											air sample
1600		25	000005.5				Ø		190	5.7	5:45 to purge out
air sample 1625		25	000005.5	~~0.35~~		~~0.25"~~	22 (.15)		184	4.7	eff PID <1, midcarbon PID <1
1740				0.41		1.1" wc				6.6	eff & midcarbon PID <1
~~1815~~				18:05 lower to			Stinger tube		to 28'		
1815		26.5	000051	0.27		0.71	Ø		184	8.6	
lower the stinger tube down at 19:15 at 30'											
1930		26.5	73.0	0.40		0.5	Ø		192	9.5	eff PID <1
2045		26.5	94.1	0.56		(0.60)	Ø		192	10.5	eff. PID & midcarbon <1
	Stinger at			31.7	at	21:35					
2145		26.5	129.9	0.23		0.6	Ø		190	10.5	eff PID <1; knock 26.0" Hg
22 50		26.5	141.1			0.6	Ø		189	11.4	eff PID <1; knock 26.0" Hg
		23:45	move Stinger to			33.0 ft					
~~10.19.00 9:30~~											

Notes:

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/17/00 **Weather** _____ **Name(s):** Dan Hook
Location _____

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE-US				EXTRACTION WELL _____				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10/17/00 16:40			[redacted]		22					
1815		16.0	28.0							
1930		13.0	30.0							
2045		11.5								20.0" manifold vacuum
2145		14.0	31.7							20.0" manifold

Notes:

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1. check system readings
2. check MP vacuum
3. check water levels

MPE Pilot Test Data Collection Sheet

Date(s) of test 10-17-02 Weather 60's & cloudy Name(s): D. Sickert

Location Repository

	Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-__ (4 FT FROM MPE WELL)						MONITORING POINT MP-__ (8 FT FROM MPE WELL)						Barometric Pressure (in. Hg)
			MP-1B		MP-1A		MP-1C		MP-2A		MP-2B		MP-2C		
			Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
	10/17 1115	0.00	26.94	0.02	25.64	0.01	28.23	0.02	25.46	0.01	25.85	0.01	25.58	0.01	
	10/17 1500	0+25		0.02		0.01		0.00							
	1500	0+50													
5.0	1640		26.77	0.01	29.70	0.17	27.66	0.00	26.24	0.00	26.58	0.025	25.73	0.00	30.20
7.0	←	1815	26.72	0.00	29.72	0.49	27.52	0.00	26.68	0.00	26.72	0.01	25.91	0.01	
8.25	1930		26.87	0.01	29.48	0.23	27.52	0.00	26.77	0.005	26.75	0.00	26.13	0.00	
9.5	2045		26.91	0.00	29.8[illegible]	0.15-0.24	27.49	0.00	26.79	0.00	26.78	0.00	26.16	0.00	30.42

Notes:
WATER LEVEL ELEVATIONS TAKEN FROM TOP OF 1/2" PVC PIPE

MPE Pilot Test Data Collection Sheet

Date(s) of test 10-17-02 **Weather** Cold Cloudy **Name(s):** Stewart
Location Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (In. Hg)
		MP-34		MP-3B		MP-3C		MP-E-49		MP-E-402		MP-E-401		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10-17/1015	0.00	25.33	0.01	25.50	0.00	28.95	0.01	25.87	0.005	25.95	0.00	25.48	0.01	
" 150	0+25		0.00		0.00				.05-.10					
10/7/1515	0+50													
" 1530								Dry						
1640		26.47	0.00	27.02	0.19	28.36	0.00	Dry	>150"	26.25	NM	26.33	NM	30.32
← 1815		26.54	0.02	27.05	0.10	28.20	0.00	Dry	150"					
1930		26.55	0.00	27.13	0.00	28.11	0.00			26.37		26.63		30.40
2045		26.60	0.00	27.17	0.00	28.20	0.00			26.74		26.72		

Notes:

∞

BACKGROUND VACUUM & WATER LEVELS ~~MPE Pilot Test Data Collection Sheet~~

~~Page 3 of 3~~

Date(s) of test 10-17-00 **Weather** 60 & Cloudy **Name(s):** D. Siegert

Location Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP- MWC-27 (FT FROM MPE WELL)		MONITORING POINT MP- MWC-27 (FT FROM MPE WELL)		MONITORING POINT MP- MWC-28 (FT FROM MPE WELL)		MONITORING POINT MP- MWC-29 (FT FROM MPE WELL)		MONITORING POINT MP- A (FT FROM MPE WELL)		MONITORING POINT MP- B (FT FROM MPE WELL)		Barometric Pressure (in. Hg)
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10/17	N/A	25.49	0.0	24.79	0.0	24.92	0.0	26.62	0.0	24.81	0.0	19.14	0.0	
	DTB→	*44.85	—	51.24*	—	63.35	—	106.32	—	40.20	—	40.37	—	

Notes:

* ADD +0.17' TO DEPTH TO BOTTOM MEASUREMENTS (DTB).

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10/18 Weather _____ Name(s): Dan Hauk / D. Siewert
Location Redesignify

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow ~~(scfm)~~	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
10/18 ~~8:00~~ 7:15		26.5	158.5		—	0.6" wc	Ø		188	12.4	eff & mid carbon PID <1
~~7:45~~					—	~~0.6" wc~~	Ø				26" Hg KO Tank
1:27		26.5	180.0		—	0.6" wc	Ø		188	12.4	eff. & Mid Carbon PID <1.0
3:35	(0.42'	Δ DEPTH IN K.O. TANK @ 22 MINUTES)									26" Hg @ KO Tank Inlet
3:40		26.5	240			0.6" W.C.	*		187	12.4	Eff. & Mid-Carbon PID = <1
5:00		26.5	262			0.55" W.C.			185	9.5	Eff. & Mid-Carbon PID = <1
	(0.72'	Δ DEPTH IN K.O. TANK @ 41 MINUTES)									
6:00		26.5	287			0.6" WC			188	12.4	Eff. Both < 1 (Carbon)
~~7:15~~											
7:15		26.5	305			0.6" WC			187	9.5	Eff Both @ < 1 (Carbon)
8:30		26.5	326			0.6" WC			191	7.6	Eff. @ Mid-Carbon = <1

Notes:
* Aspiration Air Valve @ 5% open. See MPE-US Notes.

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/18/00 **Weather** Humid / Cold (Low of 48°F) **Name(s):** Dan Heath / D. Siewert
Location Repository

Date/ Time	~~Elapsed Time (hrs)~~ Temp. (°F)	EXTRACTION WELL MPE-1C Well Head Vacuum (In. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	EXTRACTION WELL ____ Well Head Vacuum (In. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	REMARKS
10/18/00 :15		13.5	33.0		Ø					20.5 manifold Vacuum
1:27	49°	13.7	33.0		Ø					19.8 (Manifold Vacuum)
3:40	48°	13.7	34.8		~5%*	Bleed Air				20.0 (Manifold Vacuum)
5:00	48°	14.0	34.8		~5%*	Bleed Air				19.8 (Manifold Vacuum)
6:00	48°	14.0	34.8		~5-10%	Bleed Air				20.0" Hg (M.P.) (Manifold Vacuum)
7:15	47°	14.0	34.8		~5-10%	Bleed Air				20.0" Hg (Manifold Vacuum)
8:30	47°	14.0	34.8		~5-10%	Bleed Air				20.4" Hg (Manifold Vacuum)

Notes: * FLOW RATE BELOW MEASUREABLE RANGE USING 0.25" W.C. MAGNEHELIC.

MPE Pilot Test Data Collection Sheet
Page 3 of 3

+ = Vacuum
− = Pressure } FOR 10-17 ONLY

Date(s) of test 10/17 & 10/18 Weather Humid / Cold (Low of 48° F) Name(s): Dan Haak / D. Siewert
Location Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-__ (__ FT FROM MPE WELL) MP-1A Water Level (ft.)	MP-1A Vacuum (in H_2O)	MP-1B Water Level (ft.)	MP-1B Vacuum (in H_2O)	MP-1C Water Level (ft.)	MP-1C Vacuum (in H_2O)	MONITORING POINT MP-__ (__ FT FROM MPE WELL) MP-2A Water Level (ft.)	MP-2A Vacuum (in H_2O)	MP-2B Water Level (ft.)	MP-2B Vacuum (in H_2O)	MP-2C Water Level (ft.)	MP-2C Vacuum (in H_2O)	Barometric Pressure (in. Hg)	
10/17/00 21:15		29.92	+0.39	26.97	-0.005	27.47	-0.005	26.85	0.005	26.80	0.00	26.26	0.00		DH
23:[illegible]		29.94	-0.14	27.00	0.00	27.45	0.005	26.89	0.005	26.82	0.005	26.33	0.00		DH
10/18/00	:15	30.09		27.15	0.00	27.39	0.00	26.91	0.00	26.86	.005	26.42	0.00		DSS
	1:08	30.06												30.47	DSS
	1:27	~~+.40~~ 30.09	+.40	27.15	0.00	27.37	+.02	26.95	0.00	26.86	+.012	26.49	+.005	30.49	DSS
		(Rapid Swing From + to −)													
	3:40	29.98	+0.40	27.18	+.005	27.33	.01	26.98	+.009	26.90	+.008	26.57	+.08	30.49	DSS
	5:00	30.06	+0.60	27.22	+.005	27.31	.005	27.05	+.21	26.93	+.055	26.67	+.01	30.50	DSS
	6:00	30.00	+0.72	27.25	+.005	27.40	+.042	27.10	+.20	26.93	+.00	26.71	.00		DSS
	7:15	29.94	+0.8(1)	27.27	+.17	27.33	0.0		+.025	~~27.27~~	+0.05		+.005		DSS
								27.10		DS 26.98		26.75			
	8:30	29.78	+0.8	27.33	+.12	27.34	+.062	27.13	+0.185	27.04	+0.02	26.78	+0.17		DSS

Notes:
+ = Pressure } 10/18/00 (DSS)
− = Vacuum
(1) = Swing from Low to High Vac. Range

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10/17 & 10/18 **Weather** Humid (Low of 48°F) **Name(s):** Dan Hach
Location Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-3A Water Level (ft.)	MP-3A Vacuum (in H_2O)	MP-3B Water Level (ft.)	MP-3B Vacuum (in H_2O)	MP-3C Water Level (ft.)	MP-3C Vacuum (in H_2O)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MPE UC1 Water Level (ft.)	MPE UC1 Vacuum (in H_2O)	MPE UC3 Water Level (ft.)	MPE UC3 Vacuum (in H_2O)	MPE UC2 Water Level (ft.)	MPE UC2 Vacuum (in H_2O)	Barometric Pressure (in. Hg)
10/17/00 2145		26.66	-0.005	27.24	0.00	27.94	0.00	26.81	—	—	—	26.94	—	30.45
2250		26.60	-0.01	27.30	0.005	27.89	0.00	27.00	—	—	—	26.81	—	30.45
10/18/00 :	15	26.70	0.00	27.26	0.00	27.78	0.00	27.00	—	—	—	26.96	—	
	127	26.74	+0.07	27.24	0.00	27.68	0.00	27.08	—	—	—	27.00	—	30.49
	3:40	26.77	+.019	27.30	+0.85	27.57	+.005	27.18	—	—	—	27.07	—	30.49
	5:00	26.74	+.04	27.36	+0.17	27.53	+.004	27.26	—	—	—	27.12	—	30.50
	6:00	26.72	+.04	27.30	+0.01	27.45	0.00	27.36	—	—	—	27.19	—	30.51
	7:15	26.71	+.005	27.35	+0.32	27.40	0.00	27.37	—	—	—	27.16	—	30.54
	8:30	26.72	+0.50	27.30	+.035	27.31	+.005	27.43	—	—	—	27.21	—	30.51
	1010	STARTED VACUUM ON MPE-UC1.							1.0		16.0			
	10:50	FINISHED INSTALLATION OF STINGER IN MPE-UC2.												

Notes:

V = h 1.6799

MPE

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/18/00 Weather Sunny mid 60s Name(s): Dan Hauk
Location CONWR Repository

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (~~acfm~~)	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
10/18/00 11:20		27.0	394.7	0.28	—	0.9" wc	0.03" wc		200	21.0	mid carbon & eff PID <1
											Ko tank 25.5" Hg
	13:00 move	stinger in	MPE-UC1	from 34.5'	to	35.5	feet				
1305		27.0	423.9		—	1.0" wc	0.03" wc		200	14.3	eff PID <1
											Ko tank 25.5" Hg
	More	stinger at 13:50	on	MPE-UC1	from	35.5	to	37.0	feet		
air sample 14:10		27.0	450.9	0.36	—	0.7" wc	slight		204	16.7	mid carbon & eff PID <1
											Ko tank 25.5" Hg
15:15	move	stinger on	MPE-UC1	from	37.0	to	38.0	feet			
15:20		27.5	471.2	0.37	—	0.7" wc	slight		208	21.0	PID eff & mid carbon <1
											Ko tank 25.5" Hg
16:00	Move	stinger on	MPE-UC1	from	38.0	to	39.0	feet			
16:10		27.5	492.5	0.36	—	0.6" wc	slight		208	20.9	PID eff & mid carbon <1
	move	stinger on	MPE-UC1	From	39.0 ft.	to	40.0 ft.	@ 16:50			Ko tank 25.5" Hg
17:00		27.5	506.4	0.34	—	0.5" wc	slight		200	24.8	PID eff & mid carbon <1
	move	stinger at 17:35	from	40.0 ft	to	41.0 ft.					Ko tank 25.5" Hg
17:45		27.5	529.0	0.34	—	0.5" wc	slight		208	27.7	PID eff & mid carbon <1
	at 18:35 move	stinger in	MPE-UC1	from	41.0 ft	to	42.0 ft				Ko tank 25.5" Hg
19:00		27.0	550.3	0.29	—	0.4" wc	slight		200	27.7	PID eff & mid carbon <1
											Ko tank 25.5" Hg 25.5

Notes:

MPE

MPE Pilot Test Data Collection Sheet
Page 2 of 3

Date(s) of test 10/18/00 **Weather** _____ **Name(s):** Dan Hack
Location CONWR Repository

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE-UC1				EXTRACTION WELL MPE-US				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10/18/00 11:20		19.0	35.5	—	0.02"wc	16.0	35.2	—	0.01"wc	manifold 23"Hg
1305		17.5	36.5	—	0.02"wc	16.0	35.2	—	0.01"wc	manifold 23.5"Hg
1410		17.5	37.0	—	slight	16.0	35.2	—	slight	manifold 23.5"Hg
1520		18.0	38.0	—	slight	16.0	35.2	—	slight	manifold 23.5"Hg
16:10		18.0	39.0	—	slight	16.0	35.2	—	slight	manifold 23.5"Hg
17:00		18.0	40.0	—	slight	16.0	35.2	—	slight	manifold 23.0"Hg
17:45		17.0	41.0	—	slight	16.0	35.2	—	slight	manifold 22.5"Hg
19:00		15.5	42.0	—	slight	15.0	35.2	—	slight	manifold 21.0"Hg

Notes: Both points MPE-UC1 and MPE-US monitoring points exhibit similar vacuums as the well head measurements

– = positive pressure

+ – vacuum

MPE

MPE Pilot Test Data Collection Sheet
Page 3 of 3

Date(s) of test 10/18/00 Weather _____ Name(s): Dan Hack

Location CONWR Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-1A Water Level (ft.)	MP-1A Vacuum (in H_2O)	MP-1B Water Level (ft.)	MP-1B Vacuum (in H_2O)	MP-1C Water Level (ft.)	MP-1C Vacuum (in H_2O)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-2A Water Level (ft.)	MP-2A Vacuum (in H_2O)	MP-2B Water Level (ft.)	MP-2B Vacuum (in H_2O)	MP-2C Water Level (ft.)	MP-2C Vacuum (in H_2O)	Barometric Pressure (in. Hg)
10/18/00 11:20		30.27	0.60	27.57	0.005	27.31	-0.005	27.19	0.00	27.19	0.00	26.82	0.00	30.34
1305		30.32	0.80	27.80	0.11	27.30	0.00	27.16	0.00	27.27	0.00	27.00	0.00	30.25
14:10		30.21	0.60	28.05	0.02	27.35	0.00	27.18	0.005	27.31	0.005	27.16	0.005	30.25
15:20		30.09	-0.30	28.15	0.00	27.37	0.00	27.15	-0.03	27.30	-0.01	27.25	-0.005	30.21
16:10		29.99	-0.36	28.24	-0.015	27.38	-0.065	27.14	-0.14	27.31	-0.04	27.32	-0.04	30.20
17:00		29.72	-0.78	28.36	0.01	27.40	-0.035	27.13	-0.04	27.31	0.01	27.40	-0.01	30.23
17:45		29.79	0.20	28.46	0.100	27.43	0.005	Round Ended at 17:50 to to I-1-23						30.25
18:15	restart round							0.00	27.13	27.32	0.00	27.47	0.01	
19:00		30.09	0.80	28.56	0.01	27.46	0.00	27.15	0.005	27.33	-0.005	27.55	-0.005	30.40

Notes:

mPE

− positive pressure
+ vacuum

MPE Pilot Test Data Collection Sheet
Page 3 of 3

Date(s) of test 10/18/00 **Weather** _____ **Name(s):** Dan Hook
Location CONWR Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP-3A		MP-3B		MP-3C		MPE VC1		MPE VS		MPE VS2		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10/18/00	11:20	26.80	0.01	27.45	0.00	27.22	-0.005					27.40		
1305		26.81	0.02	27.40	0.00	27.17	-0.010					27.85		
14:10		26.81	0.00	27.39	0.02	27.15	-0.005					28.03		
15:20		26.76	-0.03	27.35	-0.16	27.14	+0.02					28.13		
16:10		26.76	-0.05	27.33	-0.005	27.13	-0.04					28.13		
17:00		26.73	-0.03	27.30	-0.03	27.11	0.00					28.24		
~~17:40~~	18:15	26.72	0.005	27.28	0.00	27.09	0.00					28.36		
19:00		26.77	0.04	27.34	0.04	27.14	-0.005					28.46		

Notes:

MPE Pilot Test Data Collection Sheet
Page 1 of 3

Date(s) of test 10/18/00 - 10/19/00 Weather _____ Name(s): Dan Hack
Location Repository

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (acfm)	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (scfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
10/18/00	At 20:20		Moved Stinger on MPE UC1			from		42.0 to	43.0	Ft.	
20:40		26.0	594.0	0.34	—	0.6" wc.			195	25.6	effluent & mid carbon PID <1
~~20:00~~											25.0 Ko tank
22:30		26.0	1038.0	0.40		0.5" wc			195	51.9	PID eff <1 PID mid carbon
	Moved stinger on MPE-UC2					from	44.2	to 46.0			at 23:10
23:25		25.5	1664.0	0.47	—	0.5" wc	slight		195	40.9	PID eff & mid carbon <1
											KO tank 25.0" Hg
10-19-00 (0+20)	Moved	Stinger	on MPE-UC2	from		46.0 to	48.1				

Notes:

MPE Pilot Test Data Collection Sheet
Page 2 of 3

Date(s) of test 10/18/00 - 10/19/00 **Weather** _____ **Name(s):** Dan Hask
Location Repository

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL US				EXTRACTION WELL UC1				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10/18/00 20:40		12.5	35.2	NM	slight	15.5	43.0	NM	slight	manifold upcoming 19.5 on US and 18.5 UC1
22:30		12.5	35.2	NM	slight	15.0	43.0	NM	slight	17.5 on UC1 19.2 on US
										~~US~~ manifold ~~UC1~~
23:25		12.0	35.2	NM	slight	14.5	43.0	NM	slight	UC1 = 17.0 US = 18.5
~~10:19:00~~	~~0+30~~									

Notes:

MPE Pilot Test Data Collection Sheet
Page 2 of 3

Date(s) of test 10/18/00 - 10/19/00 **Weather** _____ **Name(s):** Dan Hook
Location Repository

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL UC2				EXTRACTION WELL _____				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10/18/00 22:30		10.0	49.82	—						manifold vacuums UC2 - 18.5" Hg
23:25		8.5	40.0	—	~~[illegible]~~					manifold UC2 = 18.0" Hg
0+20	10.19.00		48.1	LOWERED STINGER TO NEW DEPTH						

Notes:

MPE Pilot Test Data Collection Sheet
Page 3 of 3

Date(s) of test 10/18/00-10/19/00 Weather 48°F (NIGHT) Name(s): Dan Haak
Location Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-__ (__ FT FROM MPE WELL) MP-1A Water Level (ft.)	MP-1A Vacuum (in H_2O)	MP-1B Water Level (ft.)	MP-1B Vacuum (in H_2O)	MP-1C Water Level (ft.)	MP-1C Vacuum (in H_2O)	MONITORING POINT MP-__ (__ FT FROM MPE WELL) MP-2A Water Level (ft.)	MP-2A Vacuum (in H_2O)	MP-2B Water Level (ft.)	MP-2B Vacuum (in H_2O)	MP-2C Water Level (ft.)	MP-2C Vacuum (in H_2O)	Barometric Pressure (in. Hg)
20:40		30.47	-0.30	28.73	0.11	27.51	-0.005	27.22	0.005	27.38	0.005	27.65	0.01	
		Start	MPE	-UC2	at	22:00		Start	45.8	feet				
22:30		30.22	-0.15	28.91	0.016	27.88	0.04	27.27	0.00	[illegible]	0.02	27.62	[illegible]	
										27.48			0.10	30.47
23:25		30.21	0.316	29.02	0.01	28.14	0.025	27.32	0.01	27.57	0.00	29.95	0.04	30.49
												~~31.47~~	~~0.06~~	
10.19.00	00:30	29.70	-.20	29.16	0.019	28.72	0.04	27.28	0.00	27.55	-.005	31.42	0.00	30.49
TEMP (°F)									0.00					
48	02:00	29.72	0.00	29.27	0.00	29.22	0.03	~~26.88~~	~~0.00~~	~~27.45~~	~~-.01~~	~~28.10~~	~~0.00~~	
								27.27	0.00	27.55	0.00	32.21	0.00	30.49
48°	03:00	29.69	-0.21	29.35	0.00	29.51	0.00	27.25	0.00	27.54	0.00	32.65	0.00	30.49
47°	03:45	29.75	-0.27	29.40	0.00	29.74	0.00	27.29	-.01	27.53	0.00	32.90	0.00	30.49
46°	04:40	29.57	-0.43	29.59	0.00	30.06	0.00	27.27	0.00	27.52	0.00	33.18	0.00	30.49
46°	06:00	29.58	-0.15	29.62	0.00	30.36	0.00	27.23	0.00	27.47	0.00	33.38	0.00	30.52
	7:40	30.48	-0.11	29.75	-0.04	30.82	0.00	27.35	-0.05	27.54	0.00	33.56	-0.014	30.52

Notes:

() or (+) = Vacuum
(-) = Pos. Pressure

NOTE: 0800 SUNLIGHT MAY BE CAUSING FALSE PRESSURE BY EXPANDING AIR IN TUBES.

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10/18/00 - 10/19/00 Weather 48° F (NIGHT) Name(s): Dan Hade
Location Repository D. Siewert

Date/Time 10/18/00	Elapsed Time (hrs)	MONITORING POINT MP-__ (__ FT FROM MPE WELL) MP-3A Water Level (ft.)	MP-3A Vacuum (in H_2O)	MP-3B Water Level (ft.)	MP-3B Vacuum (in H_2O)	MP-3C Water Level (ft.)	MP-3C Vacuum (in H_2O)	MONITORING POINT MP-__ (__ FT FROM MPE WELL) MPE UC1 Water Level (ft.)	MPE UC1 Vacuum (in H_2O)	MPE US Water Level (ft.)	MPE US Vacuum (in H_2O)	MPE UC2 Water Level (ft.)	MPE UC2 Vacuum (in H_2O)	Barometric Pressure (in. Hg)
20:40		26.85	-0.01	27.45	-0.005	27.05	-0.005	—	—	—	—	28.53	—	30.45
22:30		26.85	0.01	27.52	0.07	27.17	0.00	—	—	—	—	—	—	
23:05		26.97	0.01	27.55	0.015	27.40	0.00	—	—	—	—	—	—	
10.19.00	0+30	26.91	-.015	27.47	-0.01	27.80	0.00							
	1:35	LOWERED STINGER IN MPE-UC2 TO 50.0 FT.												
	2:00	26.88	0.0	27.45	-.01	28.10	0.0		14.1					
	2:40	LOWERED STINGER IN MPE-UC2 TO 51.7 FT.												
	3:00	26.88	0.00	27.46	-.016	28.34	0.00							
	3:45	26.85	0.00	27.43	0.00	28.46	0.00							
	4:40	26.88	0.00	27.43	0.00	28.63	0.00							
	6:00	26.81	-0.005	27.37	0.00	28.80	-0.005							
	7:40	26.86	0.00	27.56	0.00	29.03	-0.02							

Notes:
( ) = VACUUM
_ = POS. PRESS.

NOTE! 0800 - SUNLIGHT MAY BE CAUSING FALSE POSITIVE PRESSURE BY EXPANDING AIR IN TUBES.

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MPE Pilot Test Data Collection Sheet
Page 2 of 3

Date(s) of test: 10.18.00 Weather: 70 & clear Name(s): D. Siewert
Location: Repository

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE-UC1				EXTRACTION WELL MPE-US				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10.18.00	10:05	7'	34.5		50% open	11	34.8		10% open	MANIFOLD "UC1" = 8" Hg
										MANIFOLD "US" = 18" Hg
	10:15	12.5	34.5		50% open	12	34.8		10% open	" "UC1 = 18 Hg
										" US = 19 Hg
	10:25	16	34.5		50% open	11.8	34.8			" UC1 = 18.5" Hg
										" US = 18.5 Hg
	10:50	INSTALLED STINGER INTO MPE-UC2.								
										(UC1) 16.6 Man. Pr. (US) 18.0 Man. Pres
10.19.00	2:00	14.1				11.5				
	3:00	14.1				11.2				UC1 - 16.4 Man. Pr., US - 18.1 Man. Pres
	3:50	14.1				11.2				UC1 - 16.5 Man. Pres., US - 18.0 Man. Pres
	4:40	14.0				11.2				UC1 - 16.2 Man. Pres., US - 18.0 Man. Pres
	6:00	14.0				11.2				UC1 - 16.4 Man. Pres., US - 18.0 Man. Pres
	7.45	14.2				11.2				UC1 - 16.7 Man. Pres., US - 18.0 Man. Pres
	10:45	17.7				15.0				UC1 - 22.2 Man. Pres. US - 21.5 Man. Pres.

Notes: 10-18-00 ENTRIES ARE AM ENTRIES ON THAT DAY
10-19-00 ENTRIES ARE AM ENTRIES ON THAT DAY.
NOTE THAT PM ENTRIES ON 10-18-00 ARE ON OTHER FORMS

MPE Pilot Test Data Collection Sheet
Page 2 of 3

Date(s) of test: 10-18-00 Weather: 70 & CLEAR Name(s): D. SIEWERT
Location: REPOSITORY

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE-UC 2				EXTRACTION WELL _____				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10/18/00	10:50	INSTALLED STINGER INTO MPE-UC2								
10/19/00	2:00	10.5								17.5 Man. Pres.
	3:00	10.7								17.3 Man. Press.
	3:40	10.7								17.1 Man. Press.
	4:40	10.5								16.9 Man. Press.
	6:00	10.5								16.8 Man. Press.
	7:45	11.2								16.8 Man. Press.
	10:45	10.7								21.0 Man. Pressure

Notes:

MPE Pilot Test Data Collection Sheet
Page 1 of 3

Date(s) of test 10.19.00 Weather 40's (night time) Name(s): D Sievert
Location Repository

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (acfm)	VAPOR: ~~Additional~~ NET Air Flow Total (acfm)	VAPOR: Net Air ← Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
10.19.00	0:20	25	708			.95			196	38.1	2.1 PID mid, <1 PID out
	2:00	25	731			.60			196	35.1	1.1 mid, <1 out
	3:00	25	753			.60			196	34.1	1.3 mid, <1 out
	3:50	25	775	0.35		.70			196	NEI MACHINE	Lamp out - Not working
	4:40	25	797	0.34		.70			194	30.1	1.1 mid, <1 out
	6:00	25	818	0.38		.70			193	46.4	1.8 mid, <1 out
	7:45	25	862	0.39		.70			196	46.4	(<1 mid) (<1 out)
	16:45	26.2	928			.60			206	25.0	(<1 mid) (<1 out)

Notes:

V=h x 1.6799

MPE Pilot Test Data Collection Sheet
Page 1 of 3

Date(s) of test 10/19/00 - 10/20/00 **Weather** Sunny 60's **Name(s):** Dan Head
Location Repository

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow ~~(acfm)~~	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
10/19/00 13:15		26.0	992.0	0.28	—	0.8"wc	slight		202	45.2	PID eff mid carbon <1 Kotank 25.0"Hg
16:30		26.5	1057.0	0.42	—	0.7"wc	slight		208	64.9	PID eff 2.1 mid carbon 2.6 Kotank 25.0"Hg
17:35		26.0	1098.3	0.30	—	0.8"wc	slight		212	74.0	PID eff 3.0 mid carbon 3.4 Kotank 25.0"Hg
20:40		25.5	1143.0	0.29	—	0.7"wc	slight		202	86.0	PID eff 3.0 mid carbon 3.4 Kotank 24.5"Hg
21:25		25.5	1164.8	0.31	—	0.7"wc	slight		200	74.0	PID eff 5.0 mid carbon 5.0 Kotank high 24.5"Hg
10/20/00 7:20		25.0	1360.0	0.24		0.65"wc	slight		190	76.5	K1, <1 24.5"Hg
7:45 Freeman refilled the fuel tank for the generator about 41 gallons											Kotank 24.5"Hg
8:30		25.5	1381.0	0.32	—	0.7"wc	slight		197	59.7	PID <1 eff mid <1
10:10		26.0	1423	~~0.47~~ 0.28 (.26)		.9"wc	Slight		198	43.2	2.2 mid, 1.7 out
12:50		26.5	1465	0.28		.1"wc	Slight		202	42.8	1.0 mid, <1 out
1445		26.5	1501	0.277		0.0 (2)	Slight		204	31.6	<1 mid, <1 out
1645		26.5	1522	0.267		0.2 (2)	slight		202	33.8	1.3 mid, <1 out

Notes:
note 1.) light aspiration air means ball valves are cracked open, too low to read flow sensor
2.) EXHAUST AIR FLOW Reading was incorrect due to possible H_2O in tubing & Magnehelic.

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10/19/00-10/20/00 **Weather** Sunny **Name(s):** Dan Hack
Location Repository

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE UC1				EXTRACTION WELL MPE US				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10/19/00 13:15		18.0	43.0	—	slight	16.5	~~35.2~~ 34.8	—	slight	manifold UC1 = 23.0 "Hg US = 21.5 "Hg
16:30		19.0	43.0	—	slight	16.5	~~35.2~~ 34.8	—	slight	manifold UC1 = 23.0 "Hg US = 21.5 "Hg
17:35		18.0	43.0	—	slight	15.5	~~35.2~~ 34.8	—	slight	manifold UC1 = 21.0 "Hg US = 21.5 "Hg
20:40		15.5	43.0	—	slight	12.5	~~35.2~~ 34.8	—	slight	manifold UC1 = 18.0 "Hg US = 19.0" Hg
21:25		15.5	43.0	—	slight	12.5	~~35.2~~ 34.8	—	slight	manifold UC1 = 18.0 "Hg US = 19.0" Hg
10/20/00 7:20		14.0	43.0	—	slight	11.2	~~35.2~~ 34.8	—	slight	17.8" Hg US Man. Fold 16.0" Hg UC1 Man. Fold
8:30		16.0	43.0	—	slight	12.5	~~35.2~~ 34.8	—	slight	manifold UC1 18.0" Hg US 18.5" Hg
10:10		~~21.4~~ 18.0	43.0	—	Slight	14.0	34.8	—	Slight	UC1 Manifold Press = 21.4" Hg US Manifold Press = 20.6" Hg
12:50		19.0	43.0	—	Slight	17.1	34.8	—	Slight	UC1 Manifold Press. = 23.3" Hg
1495		19.2	43.0	—	Slight	20.7	34.8	—	Slight	US Manifold Press = 20.7" Hg
										UC1 Manifold Press. = 23.4" Hg
										US Manifold Press = 20.6" Hg
1645		19.2	43.0	—	Slight	16.5	34.8	—	Slight	UC1 Manifold Press = 22.2" Hg US Manifold Press = 20.7" Hg

Notes:

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MPE Pilot Test Data Collection Sheet
Page 2 of 3

Date(s) of test 10/19/00 - 10/20/00 Weather sunny 60's Name(s): Dan Hack
Location Repository

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE-UC2				EXTRACTION WELL _____				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10/19/00 13:15		16.5	~~52.2~~ 51.7	—	slight					22.5"Hg UC2 manifold
16:30		17.0	~~52.2~~ 51.7	—	slight					22.5"Hg UC2 manifold
17:35		16.5	~~52.2~~ 51.7	—	slight					21.5"Hg UC2 manifold
20:40		12.5	~~52.2~~ 51.7	—	slight					18.5"Hg UC2 manifold
21:35		12.5	~~52.2~~ 51.7	—	slight					18.0"Hg UC2 manifold
10/20/00 7:30		10.5	~~52.2~~ 51.7	—	slight					16.7"Hg UC2 Manifold
8:30		12.5	~~52.2~~ 51.7	—	slight					18.0"Hg UC2 manifold
10:10		15.5	51.7	—	slight					19.7"Hg UC2 Manifold
12:50		16.7	51.7	—	slight					22.5"Hg UC2 Manifold
1445		17.7	51.7	—	slight					23.4"Hg UC2 Manifold
1645										

Notes:

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MPE

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/19/00 - 10/20/00 Weather Sunny 60s Name(s): Dan Hack

Location Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-__ (__ FT FROM MPE WELL) MP-1A (US) Water Level (ft.)	MP-1A (US) Vacuum (in H_2O)	MP-1B (UC) Water Level (ft.)	MP-1B (UC) Vacuum (in H_2O)	MP-1C (UC2) Water Level (ft.)	MP-1C (UC2) Vacuum (in H_2O)	MONITORING POINT MP-__ (__ FT FROM MPE WELL) MP-2A Water Level (ft.)	MP-2A Vacuum (in H_2O)	MP-2B Water Level (ft.)	MP-2B Vacuum (in H_2O)	MP-2C Water Level (ft.)	MP-2C Vacuum (in H_2O)	Barometric Pressure (In. Hg)
10/19/00	10:45	30.48	1.10	29.85	-0.02	31.42	-0.01	27.46	-0.04	27.64	-0.04	33.65	-0.03	30.32
	13:15	30.56	-1.60	29.92	-0.12	31.81	0.00	27.35	-0.005	27.56	-0.02	33.55	0.00	30.20
	16:30	30.33	-0.50	29.98	0.03	32.15	0.02	27.26	0.02	27.47	0.00	33.36	-0.07	30.13
	17:35	30.26	0.90	29.99	0.07	32.27	0.02	27.30	0.02	27.49	0.00	33.33	-0.04	30.15
	20:40	30.33	0.60	30.00	0.00	32.53	0.005	27.25	-0.01	27.43	-0.02	33.17	-0.02	30.36
21:25		30.54	0.30	30.00	0.01	32.59	0.00	27.27	0.00	27.42	0.00	33.14	-0.01	30.38
10/20/00 7:20		30.42	-0.70	29.94	-0.07	33.13	-0.01	27.20	-0.02	27.35	-0.01	32.82	0.00	30.44
8:30	65°F	30.17	-1.80	29.93	-0.06	33.20	-0.025	27.20	-0.025	27.37	-0.01	32.76	-0.12	30.43
10:10	70°F	29.87	-1.5	29.90	-.02	33.22	0.00	27.13	-.03	27.26	-0.01	32.68	-.01	30.30
12:50	76°F	29.42	-2.0	29.85	-.10	33.27	0.00	27.05	-0.40	27.16	-0.01	32.54	-0.10	30.14
1445	76°F	29.35	-0.3	29.82	-.02	33.30	-.04	26.98	0.00	27.11	0.00	32.35	0.00	30.10
1600*	SITE SYSTEM DOWN Due to Fault (Bldg. 1-1-23) NOTICED BY TEG! (Turns out to be Hi-temp alarm)													
1645	76°F	29.28	0.00	29.78	-.01	33.31	0.00	26.95	0.00	27.10	0.00	32.23	0.00	30.11
16:30*	FRAC TANK Moved from Base of Repository to 1-1-23 Area, Fireman Grounded Generator @ Repository.													

Notes: * = Log Note

− = positive

+ = negative

MPE

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/19/00 - 10/20/00 **Weather** Sunny 60's **Name(s):** Dan Hook

Location Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-3A Water Level (ft.)	MP-3A Vacuum (in H_2O)	MP-3B Water Level (ft.)	MP-3B Vacuum (in H_2O)	MP-3C Water Level (ft.)	MP-3C Vacuum (in H_2O)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MPE-U1 Water Level (ft.)	MPE-U1 Vacuum (in H_2O)	MPE-U3 Water Level (ft.)	MPE-U3 Vacuum (in H_2O)	MPE-U2 Water Level (ft.)	MPE-U2 Vacuum (in H_2O)	Barometric Pressure (in. Hg)
10/19/00	10:45	27.04	-0.03	27.63	-0.03	29.25	-0.03							
13:15		26.94	0.01	27.58	0.01	29.39	-0.01	—	—	—	—	—	—	
16:30		~~27.95~~	~~0.05~~	27.49	-0.05	29.47	-0.25	—	—	—	—	—	—	
		26.88	0.00											
17:35		26.89	0.005	27.47	-0.02	29.53	0.00	—	—	—	—	—	—	
20:40		~~27.95~~	—	27.45	-0.01	29.55	-0.01	—	—	—	—	—	—	
		26.87	0.00											
21:25		26.88	0.00	27.45	0.00	29.57	0.00	—	—	—	—	—	—	
					~~0.015~~									
10/20/00 7:20		26.85	-0.033	27.44	-0.015	29.51	-0.01	—	—	—	—	—	—	
8:30		~~27.95~~	-0.03	27.34	-0.30	29.54	-0.05	—	—	—	—	—	—	
		26.78					~~-0.01~~							
10:10		26.74	-0.01	27.28	0.00	29.52	-0.01	—	—	—	—	—	—	
12:50		26.64	-0.01	27.15	-0.02	29.49	-0.01	—	—	—	—	—	—	
1445		26.58	0.00	27.10	0.00	29.44	0.00	—	—	—	—	—	—	
1645		26.55	0.00	27.06	0.00	29.41	0.00	—	—	—	—	—	—	

Notes:

- : positive pressure

+ : vacuum

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10-20-00 & 10-21-00 **Weather** 70s & CLEAR **Name(s):** D. SIEWERT
Location REPOSITORY

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (acfm)	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
10-20-00											
1815	—	26.7	1542	.283	—	.03"WC		—	212	40.4	<1 PID mid, <1 PID out
10-21-00											
7:30		25.5	1803	.274	—	.02"WC		—	198	67.5	<1 mid, <1 out

Notes:
NOTES. 1. LIGHT ASPIRATION air means ball valves are open too low to read flow.

A.

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10-20 & 10-21-00 **Weather** 70 & Clear **Name(s):** D. Siegert
Location Repository

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE-UCI Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	EXTRACTION WELL MPE-US Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	REMARKS
10-20-00										
1815		17.9	43.0	—	SLIGHT	15.4	34.8	—	SLIGHT	20.2" Hg UCI Manifold
										20.6" Hg US Manifold
10-21-00										
7:30		15.6	43.0	—	Slight	12.6	34.8	—	Slight	19.0" Hg @ U.S. Manifold
										17.4" Hg @ UCI Manifold
/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ / / / / /
8:40										
		VACUUM	WATER LEVEL	BACKGROUND	AT	EXISTING	FOGTE	WELLS		
33MWC29		0.00	26.62							
33MWC28		0.00	24.98							
33MWC27		0.025	25.06							
33MWC09		0.00	25.73	(NO PADLOCK ON WELL)						
9:00	SHUT	Both Control Panels off. Turned Generator Off								
	TOTALIZER	READING AT	SHUTOFF	= 18322.7	GALLONS					

Notes:

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MPE Pilot Test Data Collection Sheet
Page 2 of 3

Date(s) of test 10-20-00 & 10-21-00 **Weather** 70 & Clear **Name(s):** D. Siewert
Location

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE-UC2				EXTRACTION WELL _____				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10-20-00										20.5" Hg UC2 Manifold
1815		15.7	51.7	—	Slight					
10.21.00										
7:30		12.5	51.7	—	Slight					18.2" Hg @ UC2 Manifold

Notes:

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10-20-00 & 10-21-00 **Weather** Sunny 70's **Name(s):** D Siewert
Location Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (In. Hg)
		MP- 1A		MP- 1B		MP- 1C		MP- 2A		MP- 2B		MP- 2C		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10-20-00														
1815		29.25	0.00	29.79	0.00	33.30	0.00	26.93	0.00	27.07	0.00	32.18	0.00	
10-21-00														
730		29.60	0.00	29.76	-0.01	33.33	0.00	27.26	0.00	27.31	0.00	32.05	-0.03	

Notes:
( ) = Vacuum
— = Positive Pressure

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MPE Pilot Test Data Collection Sheet
Page 3 of 3

Date(s) of test 10/20/00 **Weather** 70's & clear **Name(s):** D. Siewert
Location Repository

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP-3A		MP-3B		MP-3C		MP-___		MP-___		MP-___		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10-20-00														
1815		26.56	0.00	27.03	0.00	29.40	0.00 ~~[illegible]~~							
10-21-00														
7:30		26.79	0.00	27.36	-0.025	29.18	0.00							

Notes:
( ) = Vacuum
– = Positive Pressure

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MPE – Building I-1-23

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/22/00 **Weather** cloudy **Name(s):** Dan Hook
Location I-1-23

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm) ~~(gpm) dip tube~~	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (scfm) DP "wc	VAPOR: Aspiration Air Flow Total (scfm)	VAPOR: Net Air Flow (scfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
10/22/00 8:30		25.5	2137.4	start of test	—	0.4" wc	slight		154	8.9	25.0" Hg @ Ko tank
											PID off of carbon <1
9:00		26.0	2137.4	0.22		0.3" wc			175		25.5" Hg @ Ko tank
0945		27.0		0.22		0.3" wc	slight		175	6.7	<1 ppm on mid- and effluent carbon
1040	Lower stinger in MPE UC from 15.0 to 17.0 feet										26.0 in Hg @ K/O
1050		27.0	2171.8	0.23		0.4" wc	slight		194		25.5" Hg Ko tank
1125	Lower stinger in MPE UC from 17.0 to 19.0 feet										
11:35		27.0	2178		—	0.4" wc	slight		196	6.7	25.5" Hg ko tank
12:50	Lower stinger in MPE UC from 19.0 to 20.5 feet at 12:50										
		27.0	2191.0	0.15	—	0.5" wc	slight		196	4.4	25.5" Hg Ko tank
14:00	transfer pump problems likely from sediment										<1 PID effluent and mid carbon
14:45	start MPE - US										
~~14:~~ 15:20		26.5	2493	6.3	—	0.3" wc	slight		196		25.0" Hg Ko tank
16:39		26.5	2885			0.25 wc	slight		198	13.4	25.0" Hg K/O Tank
17:10	Lowered stinger to 35' in US well										
17:38		26.5	3189	6.94		0.25" wc	Slight		203	13.4	25.0" Hg KO TANK (0.0 mid, 0.0 out)
18:10	lowered stinger to 36' in US well										
18:55 *		27.0	3995	6.88(?)		0.00" wc	?		208	15.7	<1 mid, <1 out
1910	Lowered Stinger in U.S. to 37'										25" in Hg in KO TANK
1950		27.0	4275			0.00" wc			208	24.0	25" in Hg in KO tank

Notes:
* @ 19:30. XFER Pump, slow to start, caused Hi-Level Solenoid Valve to open @ KO Tank.
20:10 " " " " " " " " " " " " " " " "

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/22/00 **Weather** cloudy **Name(s):** Dan Heat
Location I-1-23

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE-UC				EXTRACTION WELL MPE-US				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
8:30		17.0	13.2	—	slight	—	—	—	—	Draw up water that is "dirty"
		manifold vacuum		21.0"Hg						at start of test
9:00		17.5	13.2	—	slight	—	—	—	—	21.0"Hg at manifold
		stinger dropped to			15' bfc					
0945		16.0	15.0		slight	manifold vac				22.0"Hg @ manifold
1050		17.0	17.0	—	slight	—	—	—	—	21.5"Hg @ manifold
11:35		17.0	19.0	—	slight					22.5"Hg @ manifold
1310		17.5	20.5	—	slight					UC manifold = 22.5"Hg
1520		14.0	20.5	—	slight	0.0	34.2	—	slight	UC manifold = 22.0"Hg
										US manifold = 16.0"Hg
~~1738~~										UC
1738		12.3	20.5	* — *	slight	0.0	35.0	23.25	slight	US manifold = 14.8"Hg
										UC manifold = 13.0"Hg
1855		See Sheet 3 of 3					36.0	23.54		
1950		~~17.0~~ 11.5	20.5		slight	0.0	37.0	23.88	slight	UC manifold = 17.0

Notes: * WATER LEVEL PROBE UNDER VACUUM

– = positive pressure
+ = vacuum

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/22/00 Weather cloudy Name(s): Dan Hack
Location I-1-23

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP-1A		MP-1B		MP-1C		MP-2A		MP-2B		MP-2C		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
Baseline 10/22/00	7:15	7.03	0.00	19.01	-0.015	15.18	0.00	Dry at 10:14	0.00	18.85	0.00	15.22	0.00	
~~8:00~~		7.09	-0.025	19.03	-0.016	15.27	-0.01	Dry	~~7.09~~ -0.005	18.85	-0.03	15.28	0.01	30.52
9:00	1.75													
0945	2.5	7.03	0.02	19.00	-0.005	15.27	-0.01	Dry	0.005	18.82	-0.03	15.32	0.01	30.47
1050	3.6	7.08	-0.02	19.01	-0.01	15.33	-0.01	Dry	0.00	18.82	-0.005	15.35	-0.01	30.43
1135	4.25	7.09	-0.04	19.04	-0.03	15.30	-0.01	Dry	0.00	18.82	-0.03	15.30	-0.015	30.40
1310	5.75	7.05	-0.15	19.00	-0.025	15.27	-0.015	Dry	-0.005	18.81	-0.025	15.32	-0.02	30.38
1520	7.75	7.05	-0.02	18.99	0.00	16.86	-0.04	Dry	0.00	18.80	-.05	16.54	-.02	30.33
1738	10.5	7.06	0.00	18.97	0.00	15.33	0.00	Dry	0.01	18.78	0.00	16.95	0.00	30.43
1855	11.75	7.08	0.00	18.98	0.03	7.53	0.04	Dry	0.00	18.79	0.00	17.13	0.00	
1950	12.75	7.38	0.01	19.00	0.00	17.66	0.15	Dry	0.00	18.82	0.00	17.27	0.00	

Notes:

I

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/22/00 Weather cloudy Name(s): Dan Hawk
Location I-1-23

Date/Time	TIME ~~Elapsed Time (hrs)~~	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP-3A		MP-3B		MP-3C		MP-SVE		MPE UC		MPE US		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10/22/00 7:15		7.85	0.005	16.03	0.00	15.36	0.00	11.19		[illegible]		15.48		30.48
								Bottom	11.50	15.23		16.13 n	MPE well	
9:00		7.89	0.00	16.04	-0.01	15.45	0.00	—	—	—	—	15.57	—	
0930		Dropped stinger to 15' btc.												
0945		7.88	0.00	16.04	-0.01	15.43	-0.005							
1050		7.90	0.00	16.05	-0.01	15.46	-0.005	—	—	—	—	—	—	30.44
11:35		7.91	-0.02	16.04	-0.02	15.45	-0.005	11.35	—					
1310		7.84	-0.01	16.03	-0.01	15.45	-0.005	11.39	—					30.38
[illegible]	1520	7.86	-0.01	16.01	-0.005	17.00	0.00		—					30.30
1738		7.89	-0.01	16.01	0.00	17.48	0.00	11.46	—	—	12.3	23.25	0.0	30.43
1855		7.97	0.00	16.04	0.005	17.62	0.01	11.47	—	—	11.7	23.54	0.0	30.49
1950		7.98	0.01	17.65	0.01	17.72	0.00	11.48	—	—	[illegible]	23.88	0.0	30.53
									—		11.5		[illegible]	
									—					

Notes:

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MPE Pilot Test Data Collection Sheet
Page 3 of 3

Date(s) of test 10/22/00 **Weather** cloudy **Name(s):** Dan Haak
Location I-1-23

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP- (FT FROM MPE WELL)						MONITORING POINT MP- (FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP-33MW-10		MP-33MW-21		MP-33MW-22		MP-33MW-23		MP-33MW-07		MP-		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10/22/00	7:15	15.29		15.53		15.53		16.95		15.30				
9:45		15.25												
		27.24 total												
13:55		15.39		15.57		15.47		—		15.32				
15:78				15.78		15.55		—		15.55				
[redacted]														
17:38		16.76		16.04		15.63		—		15.63				
1855		16.97		16.11		15.66		—		15.88				
1950		16.96		16.15		15.47		—		15.85				

Notes:

MPE SKID SYSTEM

MPE Pilot Test Data Collection Sheet

Date(s) of test: 10/23/00 Weather: light rain, cloudy Name(s): Dan Haak, Dennis Siewert

Location: I-1-23

	Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (acfm)	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
24	10/23/00 7:15	—	27	8733	6.88	—	0.0"wc	—	—	201	23.5	<1 mid, <1 out
	9:00	—	27.0	9480	7.1	—	0.1"wc	slight	—	201	23.5	<1 mid, out sample gas bag; 25.5"Hg Kotank
	Lowered the stinger on MPE-US from 38.0 to 39.0 feet at 10:00											
27	10:15	—	27.5	9850	7.1	—	0.1"wc	slight	—	203	19.6	25.5"Hg Kotank <1 PID out
	11:10	—	27.0	10305	6.9	—	0.3"wc	slight	—	198	11.7	25.0"Hg Kotank <1 PID out
30	11:45	Move stinger on MPE-US from [illegible] to 41.0										
30.37	12:10	30	27.5	11025	4.6	—	0.3"wc	slight	—	196	19.6	25.5"Hg Kotank
	At 14:15 added 25' of discharge hose to each of 4 liner → lowered transfer pump flow to 2.2 gpm											
	14:50	—	27.0	11628	7.3	—	0.3"wc		—	206	19.6	<2 PID out mid, 25.5"Hg Kotank
33.25	16:30		27.5	12335	9.07.2	—	0.45"wc		—	208	17.6	<0 PID mid 25.5"Hg Kotank
	17:05		flow rate at K/O tank			7.75 gpm						
30.5	18:00	27.0	~~25.5~~	13070	7.2	—	0.35"wc		—	210	21.5	<0 pid mid 25.5"Hg kotank
	19:30		26.5	13850	7.58	—	0.20"wc		—	202	23.5	1 pid mid 25.5"Hg kotank
				*								

Notes:

13070 − 9850 = 3220 gallons

18.00 − 10.25 = 7.75 hours = 465 minutes

3220 gallons / 465 minutes = 6.92 gpm

* 13850 @ 20:00

20:00 − 10:15 = 9:75 hr = 585 min

13850 − 9850 = 4000

6.84 gpm

4h

MPE

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/23/00 Weather light rain, cloudy Name(s): Dan Haak, Dennis Siewert
Location I-1-23

	Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-1A Water Level (ft.)	MP-1A Vacuum (in H_2O)	MP-1B Water Level (ft.)	MP-1B Vacuum (in H_2O)	MP-1C Water Level (ft.)	MP-1C Vacuum (in H_2O)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-2A Water Level (ft.)	MP-2A Vacuum (in H_2O)	MP-2B Water Level (ft.)	MP-2B Vacuum (in H_2O)	MP-2C Water Level (ft.)	MP-2C Vacuum (in H_2O)	Barometric Pressure (in. Hg)
24	10/23/00	7:15	7.11	-0.03	18.94	0.00	18.11	-0.01	Dry	0.00	18.78	0.00	17.64	0.00	
	9:00		7.11	-0.03	18.93	-0.02	18.21	-0.04	Dry	0.00	18.77	-0.01	17.74	-0.05	
27	10:15		7.11	-0.04	18.93	-0.175	18.27	-0.20	Dry	0.00	18.78	-0.04	17.66	-0.04	30.51
	11:10		7.10	0.00	18.88	-0.015	18.27	0.00	Dry	-0.005	18.77	-0.11	17.81	0.02	30.39
		Air Solenoid opened at 11:45 for transfer pump													
	13:10		7.09	-0.035	18.95	-0.15	17.52	-0.12	Dry	0.00	18.72	-0.01	17.29	-0.03	
	13:40	Move stinger in MPE-1C from 41.0 to 40.0 feet													
	14:50		7.06	0.00	18.96	-0.005	18.29	0.00	Dry	-0.01	18.78	-0.085	17.84	0.00	
	16:30		7.09	0.00	18.95	-0.095	18.36	0.025	Dry	0.02	18.77	0.00	17.91	0.00	30.4
	18:00		7.11	0.02	18.95	.01	18.39	0.03	Dry	0.005	18.78	0.00	17.96	0.045	30.5
	19:30		7.12	0.00	18.95	0.00	18.44	0.015	Dry	0.00	18.78	0.00	17.99	0.20	30.6

Notes:

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MPE

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/23/00 Weather light rain, cloudy Name(s): Dan Haak

Location I-1-23 Dennis Liewert

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-3A Water Level (ft.)	MP-3A Vacuum (in H_2O)	MP-3B Water Level (ft.)	MP-3B Vacuum (in H_2O)	MP-3C Water Level (ft.)	MP-3C Vacuum (in H_2O)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-SVE Water Level (ft.)	MP-SVE Vacuum (in H_2O)	MP-___ Water Level (ft.)	MP-___ Vacuum (in H_2O)	MP-___ Water Level (ft.)	MP-___ Vacuum (in H_2O)	Barometric Pressure (in. Hg)
10/23/00	7:15	8.01	0.00	16.21	0.00	18.16	-0.01	11.50						
9:00		8.04	0.02	16.23	-0.01	18.26	0.00	11.50						30.59
10:15		8.05	0.00	16.26	-0.01	18.33	-0.01	11.49						
11:10		7.98	0.005	16.28	-0.01	18.33	0.00	11.51						
13:10		8.07	0.00	16.28	-0.015	17.61	-0.020	11.51						30.37
14:50		8.07	0.00	16.28	.005	18.36	0.01	11.51						
16:30		8.09	0.01	16.31	.005	18.43	0.01							30.4
18:00		8.03	0.03	16.32	.005	18.49	0.005							30.5
19:30		8.11	0.01	16.35	0.0	18.53	0.005							30.6

Notes:

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10/23/00 **Weather** light rain, cloudy **Name(s):** Dan Hack, Dennis Siewert
Location I-1-23

Date/Time 63°F	Elapsed Time (hrs)	MONITORING POINT MP- ___ (___ FT FROM MPE WELL) 33 MWC-16 Water Level (ft.)	Vacuum (in H_2O)	33 MWC 07 Water Level (ft.)	Vacuum (in H_2O)	33 MWC 21 Water Level (ft.)	Vacuum (in H_2O)	MONITORING POINT MP- ___ (___ FT FROM MPE WELL) 33 MWC 22 Water Level (ft.)	Vacuum (in H_2O)	MP- ___ Water Level (ft.)	Vacuum (in H_2O)	MP- ___ Water Level (ft.)	Vacuum (in H_2O)	Barometric Pressure (in. Hg)
10/23/00	7:15	17.61	—	16.14	—	16.47	—	15.81	—					30.61
9:00														
10:15														
10:30	freeman on site to check to generator													
11:00	move stinger from 39.0 to [illegible] feet on MPE-US									40.0 to 41.0 feet				
11:10		17.81		16.12		16.61		16.02						
13:10														
14:50		17.73		16.21		16.54		16.10						
16:30		17.87		16.26		16.65		16.15						30.4
18:00		17.91		16.29		16.68		16.18						30.5
19:30		17.97		16.30		16.71		16.20						30.6

Notes:

MPE

MPE Pilot Test Data Collection Sheet

Date(s) of test: 10/23/00 Weather: light rain, cloudy Name(s): Dan Hoak, Dennis Sivert

Location: I-1-23

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE-UC Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	EXTRACTION WELL MPE-US Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	REMARKS manifold pressure
10/23/00	7:15	10.7	20.5		Slight	0.0	37		Slight	UC Man. Press = 14" Hg, US Man. Pr. = 15.8
9:00		11.5	20.5	—		0.0	38(1)	—		UC man = 17.0" Hg, US = 15.0" Hg
~~10:15~~										UC Man. = 17.5" Hg, US = 15.5" Hg
10:15		12.0	20.5	—		0.0	39.0	—		
11:10		14.0	20.5	—		0.0	40.0	—		UC Man = 19.0" Hg, US = 17.5" Hg
13:10		18.0	20.5	—		0.0	40.0	—		UC Man = 21.5" Hg, US = 22" Hg
14:50		15.0	20.5	—		0.0	40.0	—		UC Man = 21.0" Hg, US = 16.0" Hg
16:30		14.5	20.5	—		0.0	40.0	—		UC man = 18.0" Hg, US = 16.5" Hg
18:00		13.5	20.5			0.0	40.0	—		UC man = 18.0" Hg, US = 15" Hg
19:30	11.5	~~17.0~~	20.5	—		0.0	40.0	—		UC man = 17.0" Hg, US = 16" Hg

Notes: (1) DROPPED STINGER TO 38' @ 8:20 am.

MPE Pilot Test Data Collection Sheet

Date(s) of test 10-24-00 **Weather** 70's & clear **Name(s):** D. HAAK
Location 1-1-23 D. SIEVERS

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow ~~(acfm)~~	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
7:15	48	26.5	18,565		—		slight	0.0"wc	198	29.4	~~atmidwell <1; Kotank 25.5"Hg~~
	Transfer pump	@ 9.0gpm									
9:00	50	27.0	19370	7.7	—	0.3"wc	slight	—	202	25.4	25.5"Hg kotank 1.9 mid, <1 out
10:00	Transfer	pump	@ 8.8	gpm							
10:25	—	27.5	19895	7.6	—	0.2"wc	slight	—	208	15.6	25.5"Hg Kotank <1 mid & out PID
11:35	move discharge hose to 2nd frac tank						20400 - 2137 gal = 18263 gallons				
12:30	3.25	27.5	20,938	7.35		0.40"wc	slight	0.0"wc	228	11.7	<1 mid, <1 out
14:00	—	28.0	21484	7.56	—	0.35"wc	slight	—	204	15.6	<1 mid & out, Kotank 25.5"Hg
14:50				7.35							
15:25	5.6	28.0	22200	7.7	—	0.4"wc	slight	—	200	49.0	<1 mid, <1 out
15:45	Lowered the stinger in MPE-VS from 41.5 to 42.0 feet								flowrate 7.7 gpm; transfer pump 8.7 gpm		
	PID 43.1 @ 15:50										
17:00	8	28.2	22,827	7.98		0.3"wc	slight	—	210	25.4	<1 mid, <1 out
				reel pump = 8.76		pm 0.3"wc	slight		~~210~~	~~25.4~~	~~<1 mid, <1 out~~
19:00	10	27.0 *	23933	7.56		0.3 wc	slight		203	23.5	<1 mid <1 out
		@	1945								

Notes:
Freeman refuel generators at 8:50
2137 gal. was flow totalizer at start of MPE test

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/24/00 **Weather** cloudy, 70's **Name(s):** Dan Haak
Location I-1-23 Dennis Siewert

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP- 1A		MP- 1B		MP- 1C		MP- 2A		MP- 2B		MP- 2C		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10/24/00 7:15		7.13	-0.02	18.94	-0.015	18.62	-0.04	Dry	0.00	18.76	-0.01	18.16	-0.025	
9:00		7.14	-0.06	18.94	-0.025	18.64	-0.01	Dry	-0.01	18.77	-0.03	18.23	-0.03	30.56
10:25		7.14	0.00	18.91	-0.01	18.65	0.00	Dry	-0.005	18.78	0.00	18.21	0.00	30.45
12:30		7.12	0.00	18.91	-0.015	18.75	-0.015	Dry	-0.005	18.77	-0.02	18.23	0.00	30.39
14:00		7.11	0.00	18.94	-0.075	18.70	-0.02	Dry	0.000	18.77	-0.06	18.23	-0.055	30.30
14:50						18.67						18.25		30.33
15:15						18.71						18.27		
15:25		7.12	0.00	18.94	0.00	18.75	0.00	DRY	0.00	18.76	-0.05	18.28	0.00	30.36
17:00		7.10	0.00	18.90	0.00	18.78	0.00	DRY	0.00	18.76	0.00	18.31	-0.025	
19:00		7.13	0.00	18.94	0.03	18.82	0.03	Dry	0.00	18.77	0.00	18.37	0.00	

Notes:

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10/24/00 **Weather** cloudy, 70s **Name(s):** Dan Haak
Location I-1-23 Dennis Siewert

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP-3A		MP-3B		MP-3C		MP-SVE		MP-____		MP-____		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10/24/00 7:15		8.18	0.00	16.52	0.00	18.68	0.00	11.54						
9:00		8.18	0.00	16.55	-0.03	18.74	0.005	11.54						
10:25		8.18	-0.025	16.57	-0.04	18.73	0.005	11.54						
12:30		8.12	-0.03	16.58	-0.01	18.72	0.00	11.55						
14:00		8.20	0.00	16.61	-0.01	18.72	-0.005	11.55						
14:50						18.75								
1515						18.79								
1525		8.22	0.00	16.61	0.00	18.83	0.00							
1700		8.21	0.00	16.62	0.00	18.85	0.00	11.57						
1900		8.20	0.00	16.65	0.00	18.88	0.00	11.56						
								bottom of well						

Notes:

U1

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/24/00 **Weather** cloudy, 70's **Name(s):** Dan Haak
Location I-1-23 Dennis Sewert

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE-UC				EXTRACTION WELL MPE-US				REMARKS	Temp.
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)		
10/24/00 7:15		10.5	20.5	—	slight	0.0	40.0	25.46	slight	Man UC=16.0"Hg, US=14.0"Hg	
9:00		12.0	20.5	—	slight	0.0	40.0	25.49	slight	Man UC=17.0"Hg, US=15.0"Hg	66°F
10:25		13.5	20.5	—	slight	0.0	40.0	25.49	slight	Man UC=18.0"Hg, US=15.5"Hg	84°F
12:30		13.5	20.5	—	slight	0.0	40.0	25.48	slight	Man UC=18.5"Hg, US= 15.6"Hg	84°F
14:00		15.5	20.5	—	slight	0.0	40.0	25.46	slight	Man UC=19.0"Hg US=16.0"Hg	89°F
14:20	Lowered Stinger in US well to					40.5'	(Down 6")				
1450								25.58			
1455	Lowered	Stinger in U.S. well to				41.0'	(New System Flow Rate = 7.77 GPM)			(XFER Pump = 8.7 GPM)	
1515								25.69			
1518	Lowered	Stinger	in U.S.	well to	41.5'	(New System Flow Rate =			GPM)	(XFER Pump = GPM)	
1525		15.5	20.5	—	slight	0.0	41.5	25.81	slight	UC=19.0"Hg; US=16.0"Hg	
1700		14.4	20.5	—	slight	0.0	42	25.84	slight	UC = 19.0"Hg US=16.0"Hg	80°F
1900		12.5	20.5	—	slight	0.0	42	25.89	slight	UC=17.5"Hg US=15.0"Hg	

Notes:

52

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/24/00 Weather cloudy, 70's Name(s): Dan Hook, Dennis Siewert
Location I-1-23

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP- MWC-21 Water Level (ft.)	MP- MWC-21 Vacuum (in H_2O)	MP- MWC-22 Water Level (ft.)	MP- MWC-22 Vacuum (in H_2O)	MP- MWC-07 Water Level (ft.)	MP- MWC-07 Vacuum (in H_2O)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP- MWC-16 Water Level (ft.)	MP- MWC-16 Vacuum (in H_2O)	MP-___ Water Level (ft.)	MP-___ Vacuum (in H_2O)	MP-___ Water Level (ft.)	MP-___ Vacuum (in H_2O)	Barometric Pressure (In. Hg)
10/24/00 7:15		16.76		16.47		16.38		18.18						30.63 / Temp = 58
10:25		16.86		16.45		16.41		18.16						
14:00		16.90		16.59		16.52		18.22						
1525		16.82		16.58		16.49		18.13						30.33 / Temp 84°F
1700		16.93		16.58		16.54		18.27						Temp 80°F
1900		16.99		16.65		16.57		18.35						30.48 \ 66°F

Notes:

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10/25/2000 **Weather** 730 partly cloudy 57°F **Name(s):** Dennis Stewart, Tim Petrich
Location I-1-23

Date/Time	Elapsed Time (hrs) °F	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow ~~(acfm)~~	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
10/25						in H2O					
730	30.53 57°F	26.5	29115	8.02		.25	slight		192	31.6	<1 mid <1 out
1110	30.28 68	28	30708	8.3		.3	slight		206	25.3	4.5 <1 out
13:00	Move Stinger from		42.0 to 43.0			on MPE-US		7.9gpm flow rate			0.35" wc at VS wellhead
13:10		28.0	31602	7.9		0.3" wc	slight		204	24.6	Kotank 25.5" wc df4 mid <1 PID
				7.75 @	13:40						
14:00		28.0	31895	8.3		0.3" wc	slight		200	23.6	Kotank 25.5" wc; <1 PID off

Notes: pumping effluent @ 8.3 gpm

SYSTEM SHUT DOWN @ 1500 HRS 10/25/00

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10/25/2000 **Weather** _____ **Name(s):** Dennis Siewert
Location 1-1-23 _____ Tim Petrich

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP- 1A		MP- 1B		MP- 1C		MP- 2A		MP- 2B		MP- 2C		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
	730	7.15	-0.001	18.93	-0.005	18.96	-0.03	dry	0.00	18.77	-0.02	18.43	-0.04	
	1110	7.14	0.00	18.90	-0.015	18.98	-0.01	dry	-0.01	18.76	-0.01	18.54	-0.35	
1310		7.12	-0.115	18.92	-0.03	19.01	-0.03	Dry	0.00	18.76	0.00	18.48	0.25	30.23 Temp 88.0
1400		7.12		18.93		19.00		Dry	0.00	18.76	0.00	18.47	0.25	30.20 89.0

Notes:

CSI
V1

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/25/2000 **Weather** _____ **Name(s):** Dennis Siewert
Location L-1-23 _____ Tim Petrik

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP- 3A		MP- 3B		MP- 3C		MP- 3D E		MP-___		MP-___		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10/25	730	8.30	0.00	16.80	0.00	19.02	0.00	11.57						
	1110	8.31	-0.01	16.84	-0.03	19.03	0.00	11.57						
1310		8.33	-0.04	16.84	0.00	19.06	-0.01	11.57						
1400		8.36	-0.03	16.85	-0.005	19.07	-0.01	11.56						

Notes:

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/25/2000 **Weather** _____ **Name(s):** Dennis Stewart
Location I-1-23 _____ Tim Patrick

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP- MWC-16		MP- MWC 21		MP- MWC-22		MP- MWC-07		MP-____		MP-____		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
	730	18.41		17.08		16.83		16.65						
	1110	18.54		16.99		16.77		16.64						
1310														
1400		18.40		17.01		16.83		16.65						

Notes:

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/25/2000 **Weather** _____ **Name(s):** Dennis Siewert
Location I-1-23 _____ Tim Petrich

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL MPE UC				EXTRACTION WELL MPE US				REMARKS	
		Well Head Vacuum (In. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum ~~(In. Hg)~~	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	UC "Hg manifold pressure	US "Hg pressure
10/25	730	16.5	21.5	—	slight	0.0	42	~~26~~.14	slight	16" Hg	16" Hg
	1110	19	21.5	—	slight	0.0	42	26.15	slight	20" Hg	16.5" Hg
1310		19.5	21.5	—	slight	0.35" wc	43.0	26.17	slight	19.0" Hg	17.0" Hg
1400		19.0	21.5	—	slight	0.35" wc	43.0	26.19	slight	19.0" Hg	17.0" Hg

Notes:

SVE – Building I-1-2

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/21/2000 **Weather** _____ **Name(s):** Dan Hauck, Tim Petrie
Location _____

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow ~~(acfm)~~ Δp	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
	~~1410~~		6660 baseline			in of water					
	1415	5									
	1420	10									
	1423	15								<1	
	1426	21									
	~~1445~~	21			84				238		
	1448										trip out hi temp
	1450										reset & reactivate 21 in Hg
	1500	19.5			84	2			224	<1	
	1555	19.5			88	2			234	<1	air samples
	1646	20.0	0	—	92	1.5	—		228	<1	
10/22/00	System down, because the generator was down on fault on arrival at 6:30. Could not restart at 1429 (+1729 hrs)										

Notes: effluent meter S/N 99016096 10/21/2000 @ 1410 6660 gallons

Base Line & Data
I-1-1-2

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/21/2000 **Weather** _____ **Name(s):** Dan Hack, Tim Petrick
Location _____

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP-SVE		MP-1		MP-2		MP-3		MP-___		MP-___		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
	1318		0.00		-0.060		-0.025		-.05					
	1415		8											
	1424		13.7											
	1424		17.0											
	1426		23.5											
	1430		22		.24		.03							
	1445		21		~~.01~~	.32	.01		.02					
	1500		20.8		.20		.015		.025					30.10
	1555		19.0		.30		.02		.03					
	1646		17.5	6.99	.35	dry @9.33	.012	~~6.07~~ 9.27	0.01					
				~~6.99~~										

Notes:

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I-1-1-2

Base Line

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/21/2000 Weather _____ Name(s): Dan Hauk, Tim Petrin

Location _____

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP- MWC 13		MP- MWC 24		MP- FD1		MP- FD2		MP-____		MP-____		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
	1328	11.39	-0.085	11.09	-0.08	10.17	0.00	11.67	-0.005					
	1430		0.00				.05		.01					
	1500		-0.005		-0.055		.06		.01					
	1555		0.015		-0.16		.08		.03					
	1646	11.25	0.05	11.19	0.015	10.18	.10	11.66	.04					

Notes:

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MPE Pilot Test Data Collection Sheet

Date(s) of test ~~10-23-00~~ / 10-24-2000 **Weather** 80 & Clear **Name(s):** D. SIEWERT, D. HAAK

Location 1-1-2 #2

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (acfm) ΔP (in. wc)	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
~~10-23-00~~			666	—	—		—				
8:20 Start up 10/24		22.0	666	0	~~60°F~~	3.0" wc	0.5" wc		150	1.4	<1 mid carbon 5 off west
09:30		22.0	666	0.0	~~60°F~~	3.0" wc	0.5" wc		222	<1	0.0 mid, 0.0 out
10:50		22.0	666	0.5	~~73°F~~	3.0" wc	0.5" wc		234	1.3	<1 mid, <1 out
12:30		20.0	666	—	—	3.0" wc	—		234	<1	Q mid, <1 out
14:30		21.0	666	—	—	3.0" wc	—		240	<1	Q mid, Q out
15:10		21.5	666	—	—	3.5" wc	—		230	<1	Q mid, Q out
17:00		21.5	666	—	—	3.5" wc	—		230	<1	Q mid, Q out
2000		21.5	666	—	—	3.5" wc	—		215	<1	Q mid, Q out

Notes: FLOW TOTALIZER READING @ START OF DAY: 666 GAL.

BASELINE & DATA INFO

MPE Pilot Test Data Collection Sheet

Date(s) of test 10-23-00 / 10-24-00 Weather 80 & Clear Name(s): D. Siewert, D. Haak

Location 1-1-2

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		~~MP-~~ SVE		MP-___		MP-2		MP-3		MP-___		MP-___		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10-23-00	Baseline 11:05	—	0.00	7.13	0.00	DRY	0.005	DRY	0.00					
10-24-00	Baseline 08:00	10.27		7.25	-0.05	DRY	0.005	DRY	0.00					
8:20	restart		19.0" Hg	7.25	0.00	Dry	0.00	Dry	0.00					
09:30	10/24		20.2" Hg	7.24	0.005	Dry	0.00	Dry	0.02					
10:50			21.8" Hg	7.26	0.15	Dry	0.00	Dry	0.05					
12:30		—	21.8" Hg	7.24	-0.025	Dry	-.24	Dry	-.085					
14:30		—	23.5" Hg	—		—		—						
14:41	unit	down	on high	temp	fault	adjust	relief	valve	to 21" Hg					
1510		—	23.8" Hg	—	0.10	—	.01	—	0.00					
1700		—	21.0" Hg	—	-0.005	—	-0.007	—	-0.005					
2000		—	~~21.5" Hg~~ 18.5" Hg	7.24	-0.005	dry	0.00	dry	0.005					

Notes:

9:00am - FABICK ONSITE TO FIX Generator. Tech indicated fuel Problem.
9:45 FABICK OFFSITE TO Pickup FUEL FILTERS.
10:40 FABICK ON-SITE.
11:50 FABICK STILL ON-SITE.

short circuiting noted at base of SVE well, northern side of concrete apron

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10-23-00 / 10-24-00 **Weather** 80 & clear **Name(s):** D. Siewert
Location 1-1-2 D. Haak

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP-MWC-13		MP-MWC-24		MP-FD-1		MP-FD-2		MP-FD-3		MP-___		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10-23-00	11:00	11.52	0.00	11.51	-0.06	10.23	0.00	11.96	0.015	12.27	0.00			
Baseline	~~11:00~~													
10-24-00	0800	11.58	0.00	11.49	-0.04	10.25	0.01	11.96	0.010	12.22	0.00			
0820	Start up	10/24/2000	0.00		-0.045		0.115		0.025		0.00			
0930		11.67	-.015	11.52	-0.010	10.24	0.16	11.97	0.042	12.23	0.01			
10:50		11.59	0.03	11.50	-0.32	10.23	0.16	11.90	0.08	12.24	0.00			
12:36		11.65	-0.225	11.54	-0.70	10.24	0.19	11.96	0.05	12.22	-.07			
15:10		—	0.065	—	-0.52	—	0.23	—	0.08	—	-.01			
17:00		—	0.015	—	0.01	—	0.22	—	0.08	—	-.01			
20:00		11.63	0.015	11.43	0.31	10.26	0.25	11.90	0.09	12.16	0.0			

Notes:
ACTUAL "FD" well names:
FD-1 =
FD-2 =
FD-3 =

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I-1-2

MPE Pilot Test Data Collection Sheet
Page 1 of 3

Date(s) of test 10/25/2000 **Weather** partly cloudy 60's **Name(s):** Dennis Stewart
Location I-1-2 Tim Petrin

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	Pump Inlet Temp (°F)	VAPOR (in H_2O): Exhaust Air Flow ~~(acfm)~~	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made): mid carbon	Remarks: outlet
10/25	830	21.7	666	—	—	3.6	—		202	1	<1	<1
	1100	21.5	666	—	—	3.5	—		220	<1	<1	<1
85°F	1300	21.0	666	—	—	3.5	—		230	<1	<1	<1
15:45		19.0	666	—	86°F	3.5	—		231	<1	<1	<1
17:00		19.5	666	—	76°F	3.5	—		233	<1	<1	<1

Notes:

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MPE Pilot Test Data Collection Sheet

Date(s) of test I-1-2 **Weather** Partly sunny 60's **Name(s):** Dennis Stewart
Location 10/25/2000 Jim Petrick

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP-SVE		MP-1		MP-2		MP-3		MP-___		MP-___		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
830		—	16.5	~~Dry~~ 7.34	-0.05	DRY	-0.025	DRY	-0.04					
1100		—	21.5	7.37	-0.005	Dry	0.005	Dry	-.005					
1300		—	22.6	7.41	-0.010	Dry	0.00	DRY	-.010					
15:45		—	22.0	7.51	0.015	Dry	0.015	Dry	0.00					
17:00			20.5		0.03		0.015		0.00					30.22
	SVE Shutdown at 17:20													

Notes:

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MPE Pilot Test Data Collection Sheet

Date(s) of test 10/25/2000 **Weather** Partly sunny 60's **Name(s):** Dennis Stewart, Tim Petrich

Location 1-1-2

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP- FD-1		MP- FD2		MP- FD3		MP- MWC-13		MP- MWC-24		MP-___		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
		FD-SVE1		FD-MP1		FD-MP4								
830		10.27	0.30	11.90	0.085	12.16	-0.015	11.62	-0.14	11.45	-0.024			
1100		10.26	0.32	11.89	0.10	12.17	-.07	11.52	-0.08	11.45	-0.08			
1300		10.27	0.32	11.89	0.10	12.14	-0.025	11.62	-0.015	11.44	-0.21			
15:45		10.26	0.31	11.81	0.08	12.11	-0.02	11.60	-0.04	11.42	0.00			
17:00			0.31		-0.02		-0.26							

Notes:

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SVE – Building I-1-23

BASELINE READINGS

I 1-23 SVE

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MPE Pilot Test Data Collection Sheet
Page 3 of 3

Date(s) of test 10-18-00 **Weather** 70 & Clear **Name(s):** D. Sieglent / J. Anderson
Location 1-1-23

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL)						MONITORING POINT MP-___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP-2A		MP-2B		MP-1C		MP-E-US		MP-E-UB		MP-SVE		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10/18@	12:04	BLOCKED	0.00	19.40	-0.015	16.00	-0.01	15.26	-0.005	15.00	-0.005			
	1841	plugged						15.41		15.54				
	1901													30.40
	1941												5	
	1946												14	
	1947												15.5	
	2010		Q										15.5	
	2040												15.0	
	2115							15.23		15.00			15.0	30.45
	2140							15.24		14.97			15.0	
	10/19/2000													
	1124	dry	10.2 ~~0.40~~ 2.5 stickup	19.17		14.96		15.20		14.95		10.93		

Notes:

Intermeter S/N 99016096

10/18/2000 14:53 0000060 18:57 0000650

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BASELINE READINGS

(−) = POS. PRESSURE
(+) = VACUUM

SVE

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MPE Pilot Test Data Collection Sheet
Page 3 of 3

Date(s) of test 10-18-00 **Weather** 70 & Clear **Name(s):** D. SIEWERT / J. ANDERSON
Location I-1-23

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-3C Water Level (ft.)	MP-3C Vacuum (in H_2O)	MP-3B Water Level (ft.)	MP-3B Vacuum (in H_2O)	MP-3A Water Level (ft.)	MP-3A Vacuum (in H_2O)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-1C Water Level (ft.)	MP-1C Vacuum (in H_2O)	MP-1B Water Level (ft.)	MP-1B Vacuum (in H_2O)	MP-1A Water Level (ft.)	MP-1A Vacuum (in H_2O)	Barometric Pressure (in. Hg)
10/18/00	11:53	15.11	-.005	16.95	-.005	7.38	-.025	14.94	-.02	19.80	-.023	6.99	-.025	
	12:41					7.45	Q					6.92	Q	
	20:10												+.10	
	20:40					7.40	Q					6.89	Q	
	21:31	15.11		16.67		7.39						6.90	Q	
	21:40					7.40	Q					6.91	+.005	
	10/19 11:21	15.09		16.55		7.40		14.92		19.52		6.92		

Notes:

SVE

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MPE Pilot Test Data Collection Sheet
Page 1 of 3

Date(s) of test 10.18.00 **Weather** 70 & clear **Name(s):** D. Siewert / J. Anderson
Location I-1-23

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (acfm)	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
	start										
	1940	8									
	1941	10									
	1943									.3	
	1947	20									Differential pressure
	1950				51				180	11	1.3 in water
	1953										1.4 in water
	2010	19.5			51					13	1.4
	2060	20			50				240	10	1.4
	2125	20			48				206	9	1.4
	2148	20			47				208	9	1.40

Notes:

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1-1-23 SVE

no sign = negat - pressure
– = positive pressure

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/19 Weather Sunny 75 Name(s): Tim Pepper
Location 1-1-23 SVE #1

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (acfm)	VAPOR: ~~Aspiration Air Flow Total (acfm)~~	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
10/19	1310	5									Air Flow
	1315	10			72				118		10.5 in of water
	1318	15			74				142		5.2
	1320	20			80				160		1.25
	1340	20			85				230	6	1.25
	1410	20			87				234	6	1.25
		JWA recording data									
	1600	20			86				238	8.3	1.1" dp
		Top recording data									
	1710	20			74				234	3.3	1.1 .3 back ground
	1750	20			68				230	3.3	1.1 .3 back ground
	2040	20			51				214	7	1.2
	2140	20			48				210	6	1.25 1 back ground

Notes:
effluent meter 665
665 @ 1600 hrs also – JWA
665 @ 2150

1-1-23 SVE

No sign = negative pressure
— = positive pressure

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/19 Weather Sunny 75 Name(s): Tim Patrick
Location I-1-23 SVE #1

Date/Time	~~Elapsed~~ Time (hrs)	MONITORING POINT MP- ___ (___ FT FROM MPE WELL)						MONITORING POINT MP- ___ (___ FT FROM MPE WELL)						Barometric Pressure (in. Hg)
		MP- 1A		MP- 2A		MP- 3A		MP- UC		MP- US		MP-		
		Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	Water Level (ft.)	Vacuum (in H_2O)	
10/19	1310													
	1323	6.89		dry		7.41		14.93		15.15				
	1340	6.89	slight	dry	0	7.41	-.07	14.93		15.19				
	1410	6.90	-.08	dry	0	7.40	-.055	14.91		15.17				
			—	JWA	recording data	—			DTB		DTB			
	1600	6.89		dry	0.00	7.45		14.92	20.50	15.15	42.1			30.14
		Top Recording data												
	1710	6.90		dry	0	7.43		14.89		15.17				
	1750	6.90	.07	dry	0	7.44	.075	14.90		15.18				
	2040	6.93	.070	—	—	7.49	.033	14.93		15.20				30.36
	2140	6.93	.045	—	—	7.50	.0	14.93		15.13				

Notes:

no sign = negative pre e
– = positive pressure

I-1-23 SVE

MPE Pilot Test Data Collection Sheet
Page 2 of 3

Date(s) of test 10/19 **Weather** Sunny, 75 **Name(s):** Tim Petrick
Location I-1-23 SVE #1 I-1-23

Date/ Time	~~Elapsed~~ Time (hrs)	EXTRACTION WELL SVE				EXTRACTION WELL _____				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10/19	1314	6.5								
	1316	11.5								
	1319	16.0								
	1324	21.3								
	1340	21.5								
	1410	21.5								
		— JWA recording data —								
	1600	20.3 JWA								
		TP recording								
	1710	20.25								
	1750	19.0								
	2040	14.5								
	2140	15.0								

Notes: Wellhead vacuum @ 1600 hrs was 20.3 in Hg

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/20 **Weather** Sunny 50 745 **Name(s):** Tim Petrick
Location SVE @ I-1-23 ?

Date/Time	Elapsed Time (hrs)	Vacuum Pump (in. Hg)	WATER: Total GW Extracted (gal.)	WATER: Flow Rate (gpm)	VAPOR: Pump Inlet Temp (°F)	VAPOR: Exhaust Air Flow (acfm)	VAPOR: Aspiration Air Flow Total (acfm)	VAPOR: Net Air Flow (acfm)	VAPOR: Exhaust Temp (°F)	VAPOR: PID Reading (ppm)	Remarks (sample collected, adjustments made)
											ΔP
10/20	745	20			40				200	5.5	1.25
	845	20.2			54				209	6.7*	1.25
	945	20.5			66**				220	6.6*	1.25
	1045	20.5			75				222	5.5	1.2
	1130	20.5			82				229	2.2	1.1
1300	~~100~~	20.5			88				233	0.8	1.1
	1415	20.5			91				237	0.6	1.1
	1715	20.5			73				236	0	1.1
10/21	735	20.2			53				214	3.6	1.1 effluent meter
											@ 665 gallons
										1.1	mid carbon
										>1	effluent

Notes: 10/20 745 water meter effluent 665

* 845 1 ppm background
** 66°F

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/20 **Weather** _____ **Name(s):** _____
Location _____ _____ _____

Date/ Time	Elapsed Time (hrs)	EXTRACTION WELL SVE				EXTRACTION WELL _____				REMARKS
		Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	Well Head Vacuum (in. Hg)	Drop Tube Depth (ft.)	Water Level (ft.)	Aspiration Air Flow (acfm)	
10-20-00	745	16.5								
	845	14.5								
	945	19.2								
	1045	20.5								
	130	20.8								
1300	~~100~~	22								
	1415	22.2								
10/21	10/21									
745	745	15.5		9.79						

Notes:

8

MPE Pilot Test Data Collection Sheet

Date(s) of test 10/20 Weather _____ Name(s): Tim Petrick
Location _____

Date/Time	Elapsed Time (hrs)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-1A Water Level (ft.)	MP-1A Vacuum (in H_2O)	MP-2A Water Level (ft.)	MP-2A Vacuum (in H_2O)	MP-3A Water Level (ft.)	MP-3A Vacuum (in H_2O)	MONITORING POINT MP-___ (___ FT FROM MPE WELL) MP-UC Water Level (ft.)	MP-UC Vacuum (in H_2O)	MP-US Water Level (ft.)	MP-US Vacuum (in H_2O)	MP-___ Water Level (ft.)	MP-___ Vacuum (in H_2O)	Barometric Pressure (in. Hg)
	745	6.94	.18	dry	—	7.56	Q	14.96		15.23				
	845	6.95	Q	dry	—	7.55	Q	14.97		15.24				
	945	—	.067	dry	—	—	.005	14.96		15.23				
	1045	—	.092	dry	—	—	.004	14.96		15.24				
	1130	—	.05	dry	—	—	.007	14.96		15.25				
1300	~~100~~	—	-.01	—	—	—	.02	14.96		15.24				
	1415	—	-.005	—	—	—	.02	14.96		15.22				
	1600													System down
														blower
	1715	—	.045	—	—	—	.02	14.96		15.22				high temp
														set at
														275°F
10/21	~~745~~		pegged @ 0.25					15.04		15.33				
	748	6.97	.20	dry	Q	7.71	.03	20.35	DTBottom					
		Placed 0-1 magnehelic gage on												
										42.5	DTBottom			

Notes:								
	MP1B	19.34	MP3C	15.12	MP1B	19.19	MP1C	15.03
	MP2B	19.04	MP2C	15.03	MP2B	18.96	MP2C	15.04
	MP3B	16.29	MP1C	14.95	MP3B	16.10	MP3C	15.18
	time	1050	time	1050	time	755	time	755
00	10/20		10/20		10/21		10/21	

82/82

Appendix N
Pilot Test Groundwater Sampling Laboratory Data

Sample Identification

inv ok

SEVERN TRENT SERVICES

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720-6961

Tel: 330 497 9396
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www.stl-inc.com

ANALYTICAL REPORT

REC'D RMT 11-3-00

CONWR

Lot #: A0J020134

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

October 31, 2000

5

CASE NARRATIVE

A0J020134

The following report contains the analytical results for one water sample submitted to STL North Canton by RMT from the CONWR site. The sample was received on October 2, 2000, according to documented sample acceptance procedures.

Dissolved Gas analysis was performed at STL's Austin, Texas.

STL utilizes USEPA approved methods in all analytical work. The sample presented in this report was analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The soil samples and trip blank were logged and reported under separate cover.

SUPPLEMENTAL QC INFORMATION

GC VOLATILES

The matrix spike/matrix spike duplicate recoveries and/or precision were outside criteria. Acceptable laboratory control sample analysis data demonstrated that the analytical system was operating within control and this condition is most likely due to a matrix effect.

GENERAL CHEMISTRY

The sample(s) had elevated reporting limits due to matrix interferences or dilution.

CASE NARRATIVE

A0J020134

The following report contains the analytical results for one water sample submitted to STL North Canton by RMT from the CONWR site. The sample was received on October 2, 2000, according to documented sample acceptance procedures.

Dissolved Gas analysis was performed at STL's Austin, Texas.

STL utilizes USEPA approved methods in all analytical work. The sample presented in this report was analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The aqueous samples were logged and reported under separate cover.

SUPPLEMENTAL QC INFORMATION

GC VOLATILES

The matrix spike/matrix spike duplicate recoveries and/or precision were outside criteria. Acceptable laboratory control sample analysis data demonstrated that the analytical system was operating within control and this condition is most likely due to a matrix effect.

GENERAL CHEMISTRY

The sample(s) had elevated reporting limits due to matrix interferences or dilution.

SDG NARRATIVE

This narrative pertains to a sample received from the RMT CONWR Site. This data package, completed by STL North Canton, consists of data from the Volatile analysis of one (1) water sample using the CLP OLC02.1 protocol.

The following is a listing of the sample in SDG 0J02134:

Client ID	Laboratory ID	Sample Receipt Date
GW32/33-18-000929	DLDRM	10/02/00

During the preparation and analyses of these samples, the following items were noted:

1. There were no anomalies encountered during analysis.

Kenneth J. Kuzior
Project Manager
October 31, 2000

SAMPLE SUMMARY

A0J020134

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DLDRM	001	GW32/33-128-000929	09/29/00	15:55
DLDRT	003	HOLDBLK	09/29/00	

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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ANALYTICAL REPORT

REC'D RMT 11-21-00

COPY

PROJECT NO. 4781.06

CONWR
SDG #: 0J17140

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

November 19, 2000

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CASE NARRATIVE
SDG 0J17140

The following report contains the analytical results for eleven water samples submitted to STL North Canton by RMT from the CONWR Site, project number 4781.06. The samples were received on October 17, 18, 19, 20, 24 and 26, 2000, according to documented sample acceptance procedures

This SDG consists of six (6) laboratory Ids: A0J170140, A0J180250, A0J190227, A0J200230, A0J240197 and A0J260297.

The Dissolved Gases analyses were performed at the STL Austin laboratory. A copy of their data is presented in this report.

STL North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. A summary of QC data for these analyses is included at the rear of the report. Preliminary results were provided to Eric Gredell and Steve Martin on November 3, 7 and 8, 2000.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

SAMPLE RECEIVING

The coolers were received at temperatures ranging from –0.5 to 7.4° C. . The samples were received in wet ice.

GENERAL CHEMISTRY

Some samples had elevated reporting limits due to matrix interferences or dilution.

The Total Dissolved Solids analysis for sample GW-32/33-504-001015 was analyzed after the recommended holding time had been exceeded to analyst oversight.

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SAMPLE SUMMARY

A0J170140

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DM9MW	001	GW-32/33-504-001015	10/15/00	17:2(
DM9M7	002	GW-32/33-301-001016	10/16/00	12:46
DNCVD	003	HLDBLK	10/18/00	

NOTE(S):

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SAMPLE SUMMARY

A0J190227

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DNFGC	001	GW32/33-302-001018	10/18/00	08:1
DNFG6	002	TRIP BLANK	10/18/00	

NOTE(S):

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SAMPLE SUMMARY

A0J180250

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DNC3E	001	GW32/33-502-001017	10/17/00	13:55
DNC37	002	GW32/33-503-001017	10/17/00	15:30
DNC39	003	GW32/33-303-001017	10/17/00	16:30
DNC4A	004	FDUP32/33-100-001017	10/17/00	
DNC4D	005	REPOSITORY, US 10/17/00	10/17/00	15:40

NOTE(S):

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North Canton, OH 44720-6961

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Fax: 330 497 0772
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ANALYTICAL REPORT

REC'D RMT 11-21-00

PROJECT NO. 3781.06

CRAB ORCHARD

Lot #: A0J240205

Eric Gredell

RMT
744 Heartland Trail
P.O. Box 8923
Madison, WI 53708-8923

SEVERN TRENT LABORATORIES, INC.

Kenneth J. Kuzior
Project Manager

November 16, 2000

17

CASE NARRATIVE
A0J240205

The following report contains the analytical results for one water sample submitted to STL North Canton by RMT from the Crab Orchard Site, project number 3781.06. The sample was received on October 24, 2000, according to documented sample acceptance procedures.

STL utilizes USEPA approved methods in all analytical work. The sample presented in this report was analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

GC/MS VOLATILES

Sample(s) which contain concentrations of target analyte(s) at a reportable level in the associated method blank(s) have been flagged with B. All target analytes in the method blank must be below the reporting limits (RL) or the associated sample(s) must be ND with the exception of Methylene chloride, Acetone, and 2-Butanone. These are common laboratory contaminants and may be present in concentrations up to five times the reporting limits.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

SAMPLE SUMMARY

A0J200230

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DNH49	001	REPOSITORY US-UCI	10/18/00	14:10

NOTE(S):

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- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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SAMPLE SUMMARY

A0J240197

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DNM5V	001	REPOSITORY TEST END	10/21/00	08:0
DNM6T	002	I-1-23-24HR VC-US	10/23/00	08:4
DNM60	003	I-1-23 MPE HR. 1	10/22/00	08:4

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
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- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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SAMPLE SUMMARY

A0J260297

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
DNVXN	001	I-1-23 TEST END	10/25/00	15:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- *Results noted as "ND" were not detected at or above the stated limit.*
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

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Volatile Organics Data Sheets

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WG Lab Sample ID: A0J020134 001
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 10/02/00
Work Order: DLDRM101 Date Extracted: 10/09/00
Dilution factor: 8333.33 Date Analyzed: 10/09/00
Moisture %:

QC Batch: 0284100

Client Sample Id: GW32/33-128-000929

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	42000	U
71-43-2	Benzene	8300	U
74-97-5	Bromochloromethane	8300	U
75-27-4	Bromodichloromethane	8300	U
75-25-2	Bromoform	8300	U
74-83-9	Bromomethane	8300	U
78-93-3	2-Butanone	42000	U
75-15-0	Carbon disulfide	8300	U
56-23-5	Carbon tetrachloride	8300	U
108-90-7	Chlorobenzene	8300	U
124-48-1	Dibromochloromethane	8300	U
96-12-8	1,2-Dibromo-3-chloropropane	17000	U
75-00-3	Chloroethane	8300	U
67-66-3	Chloroform	8300	U
74-87-3	Chloromethane	8300	U
106-93-4	1,2-Dibromoethane	8300	U
95-50-1	1,2-Dichlorobenzene	8300	U
541-73-1	1,3-Dichlorobenzene	8300	U
106-46-7	1,4-Dichlorobenzene	8300	U
75-34-3	1,1-Dichloroethane	8300	U
107-06-2	1,2-Dichloroethane	8300	U
75-35-4	1,1-Dichloroethene	8300	U
156-59-2	**cis-1,2-Dichloroethene**	**19000**	
156-60-5	trans-1,2-Dichloroethene	8300	U
78-87-5	1,2-Dichloropropane	8300	U
10061-01-5	cis-1,3-Dichloropropene	8300	U
10061-02-6	trans-1,3-Dichloropropene	8300	U
100-41-4	Ethylbenzene	8300	U

RMT

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WG Lab Sample ID: A0J020134 001
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 10/02/00
Work Order: DLDRM101 Date Extracted: 10/09/00
Dilution factor: 8333.33 Date Analyzed: 10/09/00
Moisture %:

QC Batch: 0284100

Client Sample Id: GW32/33-128-000929

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
591-78-6	2-Hexanone	42000	U
75-09-2	Methylene chloride	17000	U
108-10-1	4-Methyl-2-pentanone	8300	U
100-42-5	Styrene	8300	U
79-34-5	1,1,2,2-Tetrachloroethane	8300	U
127-18-4	Tetrachloroethene	8300	U
108-88-3	Toluene	8300	U
71-55-6	1,1,1-Trichloroethane	8300	U
79-00-5	1,1,2-Trichloroethane	8300	U
79-01-6	**Trichloroethene**	**110000**	
75-01-4	Vinyl chloride	8300	U
1330-20-7	Xylenes (total)	8300	U

RMT
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WG Lab Sample ID: A0J020134 001
Method: OCLP OLC02.1
Volatile Organics, GC/MS (CLP-Low Level)

Sample WT/Vol: 25 / mL Date Received: 10/02/00
Work Order: DLDRM101 Date Extracted: 10/09/00
Dilution factor: 8333.33 Date Analyzed: 10/09/00
Moisture %:
QC Batch: 0284100
Client Sample Id: GW32/33-128-000929

(ug/L or ug/kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
3789-85-3	Benzoic acid, 2-[(trimethyls	23.572	47000	NJ

FORM I - TIC

RMT

Lab Name:Severn Trent Laboratories, Inc. SDG Number:0J02134

Matrix: (soil/water) WG Lab Sample ID:A0J020134 001
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 40 / mL Date Received: 10/02/00
Work Order: DLDRM109 Date Extracted:10/11/00
Dilution factor: 1 Date Analyzed: 10/11/00
Moisture %:

QC Batch: 0291092

Client Sample Id: GW32/33-128-000929

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	84	E
74-84-0	Ethane	9.3	
74-85-1	Ethene	22	

RMT

Client Sample ID: GW-32/33-301-001016

GC/MS Volatiles

Lot-Sample #...: A0J170140-002 Work Order #...: DM9M71AA Matrix.....: WG
Date Sampled...: 10/16/00 12:46 Date Received..: 10/17/00
Prep Date.....: 10/19/00 Analysis Date..: 10/19/00
Prep Batch #...: 0294104
Dilution Factor: 100 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	500	ug/L
Benzene	ND	100	ug/L
Bromochloromethane	ND	100	ug/L
Bromodichloromethane	ND	100	ug/L
Bromoform	ND	100	ug/L
Bromomethane	ND	100	ug/L
2-Butanone	ND	500	ug/L
Carbon disulfide	ND	100	ug/L
Carbon tetrachloride	ND	100	ug/L
Chlorobenzene	ND	100	ug/L
Dibromochloromethane	ND	100	ug/L
1,2-Dibromo-3-chloro-propane	ND	200	ug/L
Chloroethane	ND	100	ug/L
Chloroform	ND	100	ug/L
Chloromethane	ND	100	ug/L
1,2-Dibromoethane	ND	100	ug/L
1,2-Dichlorobenzene	ND	100	ug/L
1,3-Dichlorobenzene	ND	100	ug/L
1,4-Dichlorobenzene	ND	100	ug/L
1,1-Dichloroethane	ND	100	ug/L
1,2-Dichloroethane	ND	100	ug/L
1,1-Dichloroethene	ND	100	ug/L
cis-1,2-Dichloroethene	**1300**	**100**	**ug/L**
trans-1,2-Dichloroethene	**44 J**	**100**	**ug/L**
1,2-Dichloropropane	ND	100	ug/L
cis-1,3-Dichloropropene	ND	100	ug/L
trans-1,3-Dichloropropene	ND	100	ug/L
Ethylbenzene	ND	100	ug/L
2-Hexanone	ND	500	ug/L
Methylene chloride	**23 J,B**	**200**	**ug/L**
4-Methyl-2-pentanone	ND	100	ug/L
Styrene	ND	100	ug/L
1,1,2,2-Tetrachloroethane	ND	100	ug/L
Tetrachloroethene	**630**	**100**	**ug/L**
Toluene	ND	100	ug/L
1,1,1-Trichloroethane	ND	100	ug/L
1,1,2-Trichloroethane	ND	100	ug/L
Trichloroethene	**1000**	**100**	**ug/L**

(Continued on next page)

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RMT

Client Sample ID: GW-32/33-301-001016

GC/MS Volatiles

Lot-Sample #...: A0J170140-002 Work Order #...: DM9M71AA Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Vinyl chloride	280	100	ug/L
Xylenes (total)	ND	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	102	(80 - 120)

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

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RMT

Client Sample ID: GW32/33-302-001018

GC/MS Volatiles

Lot-Sample #...: A0J190227-001 Work Order #...: DNFGC1AA Matrix.....: WG
Date Sampled...: 10/18/00 08:15 Date Received..: 10/19/00
Prep Date.....: 10/20/00 Analysis Date..: 10/20/00
Prep Batch #...: 0298160
Dilution Factor: 12.5 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	62	ug/L
Benzene	ND	12	ug/L
Bromochloromethane	ND	12	ug/L
Bromodichloromethane	ND	12	ug/L
Bromoform	ND	12	ug/L
Bromomethane	ND	12	ug/L
2-Butanone	ND	62	ug/L
Carbon disulfide	ND	12	ug/L
Carbon tetrachloride	ND	12	ug/L
Chlorobenzene	**6.5 J**	**12**	**ug/L**
Dibromochloromethane	ND	12	ug/L
1,2-Dibromo-3-chloro-propane	ND	25	ug/L
Chloroethane	ND	12	ug/L
Chloroform	ND	12	ug/L
Chloromethane	ND	12	ug/L
1,2-Dibromoethane	ND	12	ug/L
1,2-Dichlorobenzene	**3.8 J**	**12**	**ug/L**
1,3-Dichlorobenzene	**5.1 J**	**12**	**ug/L**
1,4-Dichlorobenzene	**12**	**12**	**ug/L**
1,1-Dichloroethane	ND	12	ug/L
1,2-Dichloroethane	ND	12	ug/L
1,1-Dichloroethene	**1.3 J**	**12**	**ug/L**
cis-1,2-Dichloroethene	**110**	**12**	**ug/L**
trans-1,2-Dichloroethene	ND	12	ug/L
1,2-Dichloropropane	ND	12	ug/L
cis-1,3-Dichloropropene	ND	12	ug/L
trans-1,3-Dichloropropene	ND	12	ug/L
Ethylbenzene	ND	12	ug/L
2-Hexanone	ND	62	ug/L
Methylene chloride	ND	25	ug/L
4-Methyl-2-pentanone	ND	12	ug/L
Styrene	ND	12	ug/L
1,1,2,2-Tetrachloroethane	ND	12	ug/L
Tetrachloroethene	**3.2 J**	**12**	**ug/L**
Toluene	**3.9 J**	**12**	**ug/L**
1,1,1-Trichloroethane	ND	12	ug/L
1,1,2-Trichloroethane	ND	12	ug/L
Trichloroethene	**30**	**12**	**ug/L**

(Continued on next page)

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RMT

Client Sample ID: GW32/33-302-001018

GC/MS Volatiles

Lot-Sample #...: A0J190227-001 Work Order #...: DNFGC1AA Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Vinyl chloride	82	12	ug/L
Xylenes (total)	ND	12	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	110	(80 - 120)

NOTE(S):

J Estimated result. Result is less than RL.

32

RMT

Client Sample ID: GW32/33-303-001017

GC/MS Volatiles

Lot-Sample #...: A0J180250-003 Work Order #...: DNC391AD Matrix.....: WG
Date Sampled...: 10/17/00 16:30 Date Received..: 10/18/00
Prep Date.....: 10/20/00 Analysis Date..: 10/20/00
Prep Batch #...: 0298160
Dilution Factor: 416.67 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Toluene	ND	420	ug/L
Trichloroethene	**510**	**420**	**ug/L**
Vinyl chloride	**2100**	**420**	**ug/L**
Xylenes (total)	ND	420	ug/L
1,1,1-Trichloroethane	ND	420	ug/L
1,1,2-Trichloroethane	ND	420	ug/L
Tetrachloroethene	**2000**	**420**	**ug/L**
Acetone	ND	2100	ug/L
Benzene	ND	420	ug/L
Bromochloromethane	ND	420	ug/L
Bromodichloromethane	ND	420	ug/L
Bromoform	ND	420	ug/L
Bromomethane	ND	420	ug/L
2-Butanone	ND	2100	ug/L
Carbon disulfide	ND	420	ug/L
Carbon tetrachloride	ND	420	ug/L
Chlorobenzene	ND	420	ug/L
Dibromochloromethane	ND	420	ug/L
1,2-Dibromo-3-chloro-propane	ND	830	ug/L
Chloroethane	ND	420	ug/L
Chloroform	ND	420	ug/L
Chloromethane	ND	420	ug/L
1,2-Dibromoethane	ND	420	ug/L
1,2-Dichlorobenzene	ND	420	ug/L
1,3-Dichlorobenzene	ND	420	ug/L
1,4-Dichlorobenzene	ND	420	ug/L
1,1-Dichloroethane	ND	420	ug/L
1,2-Dichloroethane	ND	420	ug/L
1,1-Dichloroethene	ND	420	ug/L
cis-1,2-Dichloroethene	**5700**	**420**	**ug/L**
trans-1,2-Dichloroethene	ND	420	ug/L
1,2-Dichloropropane	ND	420	ug/L
cis-1,3-Dichloropropene	ND	420	ug/L
trans-1,3-Dichloropropene	ND	420	ug/L
Ethylbenzene	ND	420	ug/L
2-Hexanone	ND	2100	ug/L
Methylene chloride	ND	830	ug/L
4-Methyl-2-pentanone	ND	420	ug/L

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RMT

Client Sample ID: GW32/33-303-001017

GC/MS Volatiles

Lot-Sample #...: A0J180250-003 Work Order #...: DNC391AD Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Styrene	ND	420	ug/L
1,1,2,2-Tetrachloroethane	ND	420	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	113	(80 - 120)

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RMT

Client Sample ID: FDUP32/33-100-001017

GC/MS Volatiles

Lot-Sample #...: A0J180250-004 Work Order #...: DNC4A1AD Matrix.....: WG
Date Sampled...: 10/17/00 Date Received..: 10/18/00
Prep Date.....: 10/20/00 Analysis Date..: 10/20/00
Prep Batch #...: 0298160
Dilution Factor: 312.5 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Toluene	ND	310	ug/L
Trichloroethene	**530**	**310**	**ug/L**
Vinyl chloride	**2100**	**310**	**ug/L**
Xylenes (total)	ND	310	ug/L
1,1,1-Trichloroethane	ND	310	ug/L
1,1,2-Trichloroethane	ND	310	ug/L
Tetrachloroethene	**2000**	**310**	**ug/L**
Acetone	ND	1600	ug/L
Benzene	ND	310	ug/L
Bromochloromethane	ND	310	ug/L
Bromodichloromethane	ND	310	ug/L
Bromoform	ND	310	ug/L
Bromomethane	ND	310	ug/L
2-Butanone	ND	1600	ug/L
Carbon disulfide	ND	310	ug/L
Carbon tetrachloride	ND	310	ug/L
Chlorobenzene	ND	310	ug/L
Dibromochloromethane	ND	310	ug/L
1,2-Dibromo-3-chloro-propane	ND	620	ug/L
Chloroethane	ND	310	ug/L
Chloroform	ND	310	ug/L
Chloromethane	ND	310	ug/L
1,2-Dibromoethane	ND	310	ug/L
1,2-Dichlorobenzene	ND	310	ug/L
1,3-Dichlorobenzene	ND	310	ug/L
1,4-Dichlorobenzene	ND	310	ug/L
1,1-Dichloroethane	ND	310	ug/L
1,2-Dichloroethane	ND	310	ug/L
1,1-Dichloroethene	ND	310	ug/L
cis-1,2-Dichloroethene	**5600**	**310**	**ug/L**
trans-1,2-Dichloroethene	ND	310	ug/L
1,2-Dichloropropane	ND	310	ug/L
cis-1,3-Dichloropropene	ND	310	ug/L
trans-1,3-Dichloropropene	ND	310	ug/L
Ethylbenzene	ND	310	ug/L
2-Hexanone	ND	1600	ug/L
Methylene chloride	ND	620	ug/L
4-Methyl-2-pentanone	ND	310	ug/L

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RMT

Client Sample ID: FDUP32/33-100-001017

GC/MS Volatiles

Lot-Sample #...: A0J180250-004 Work Order #...: DNC4A1AD Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Styrene	ND	310	ug/L
1,1,2,2-Tetrachloroethane	ND	310	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	109	(80 - 120)

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RMT

Client Sample ID: GW32/33-502-001017

GC/MS Volatiles

Lot-Sample #...: A0J180250-001 Work Order #...: DNC3E1AA Matrix.....: WG
Date Sampled...: 10/17/00 13:55 Date Received..: 10/18/00
Prep Date.....: 10/20/00 Analysis Date..: 10/20/00
Prep Batch #...: 0298160
Dilution Factor: 33.33 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Toluene	ND	33	ug/L
Trichloroethene	**400**	**33**	**ug/L**
Vinyl chloride	ND	33	ug/L
Xylenes (total)	ND	33	ug/L
1,1,1-Trichloroethane	ND	33	ug/L
1,1,2-Trichloroethane	ND	33	ug/L
Tetrachloroethene	**490**	**33**	**ug/L**
Acetone	ND	170	ug/L
Benzene	ND	33	ug/L
Bromochloromethane	ND	33	ug/L
Bromodichloromethane	ND	33	ug/L
Bromoform	ND	33	ug/L
Bromomethane	ND	33	ug/L
2-Butanone	ND	170	ug/L
Carbon disulfide	ND	33	ug/L
Carbon tetrachloride	ND	33	ug/L
Chlorobenzene	ND	33	ug/L
Dibromochloromethane	ND	33	ug/L
1,2-Dibromo-3-chloro-propane	ND	67	ug/L
Chloroethane	ND	33	ug/L
Chloroform	ND	33	ug/L
Chloromethane	ND	33	ug/L
1,2-Dibromoethane	ND	33	ug/L
1,2-Dichlorobenzene	ND	33	ug/L
1,3-Dichlorobenzene	ND	33	ug/L
1,4-Dichlorobenzene	ND	33	ug/L
1,1-Dichloroethane	ND	33	ug/L
1,2-Dichloroethane	ND	33	ug/L
1,1-Dichloroethene	ND	33	ug/L
cis-1,2-Dichloroethene	**230**	**33**	**ug/L**
trans-1,2-Dichloroethene	ND	33	ug/L
1,2-Dichloropropane	ND	33	ug/L
cis-1,3-Dichloropropene	ND	33	ug/L
trans-1,3-Dichloropropene	ND	33	ug/L
Ethylbenzene	ND	33	ug/L
2-Hexanone	ND	170	ug/L
Methylene chloride	ND	67	ug/L
4-Methyl-2-pentanone	ND	33	ug/L

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RMT

Client Sample ID: GW32/33-502-001017

GC/MS Volatiles

Lot-Sample #...: A0J180250-001 Work Order #...: DNC3E1AA Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Styrene	ND	33	ug/L
1,1,2,2-Tetrachloroethane	ND	33	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	105	(80 - 120)

38

RMT

Client Sample ID: GW32/33-503-001017

GC/MS Volatiles

Lot-Sample #...: A0J180250-002 Work Order #...: DNC371AD Matrix.....: WG
Date Sampled...: 10/17/00 15:30 Date Received..: 10/18/00
Prep Date.....: 10/20/00 Analysis Date..: 10/20/00
Prep Batch #...: 0298160
Dilution Factor: 1 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
1,2-Dibromo-3-chloro-propane	ND	2.0	ug/L
Chloroethane	ND	1.0	ug/L
Chloroform	ND	1.0	ug/L
Chloromethane	ND	1.0	ug/L
1,2-Dibromoethane	ND	1.0	ug/L
1,2-Dichlorobenzene	ND	1.0	ug/L
1,3-Dichlorobenzene	ND	1.0	ug/L
1,4-Dichlorobenzene	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
cis-1,2-Dichloroethene	**0.65 J**	**1.0**	**ug/L**
trans-1,2-Dichloroethene	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
2-Hexanone	ND	5.0	ug/L
Methylene chloride	ND	2.0	ug/L
4-Methyl-2-pentanone	ND	1.0	ug/L
Styrene	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Bromomethane	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Trichloroethene	**2.2**	**1.0**	**ug/L**
Vinyl chloride	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Tetrachloroethene	**4.1**	**1.0**	**ug/L**
Acetone	ND	5.0	ug/L
2-Butanone	ND	5.0	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
Benzene	ND	1.0	ug/L
Bromochloromethane	ND	1.0	ug/L

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RMT

Client Sample ID: GW32/33-503-001017

GC/MS Volatiles

Lot-Sample #...: A0J180250-002 Work Order #...: DNC371AD Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	119	(80 - 120)

NOTE(S):

J Estimated result. Result is less than RL.

40

RMT

Client Sample ID: GW-32/33-504-001015

GC/MS Volatiles

Lot-Sample #...: A0J170140-001 **Work Order #...:** DM9MW1AA **Matrix.....:** WG
Date Sampled...: 10/15/00 17:20 **Date Received..:** 10/17/00
Prep Date.....: 10/19/00 **Analysis Date..:** 10/19/00
Prep Batch #...: 0294104
Dilution Factor: 31.25 **Method.....:** OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	160	ug/L
Benzene	ND	31	ug/L
Bromochloromethane	ND	31	ug/L
Bromodichloromethane	ND	31	ug/L
Bromoform	ND	31	ug/L
Bromomethane	ND	31	ug/L
2-Butanone	ND	160	ug/L
Carbon disulfide	ND	31	ug/L
Carbon tetrachloride	ND	31	ug/L
Chlorobenzene	ND	31	ug/L
Dibromochloromethane	ND	31	ug/L
1,2-Dibromo-3-chloro-propane	ND	62	ug/L
Chloroethane	ND	31	ug/L
Chloroform	ND	31	ug/L
Chloromethane	ND	31	ug/L
1,2-Dibromoethane	ND	31	ug/L
1,2-Dichlorobenzene	ND	31	ug/L
1,3-Dichlorobenzene	ND	31	ug/L
1,4-Dichlorobenzene	ND	31	ug/L
1,1-Dichloroethane	ND	31	ug/L
1,2-Dichloroethane	ND	31	ug/L
1,1-Dichloroethene	ND	31	ug/L
cis-1,2-Dichloroethene	**40**	**31**	**ug/L**
trans-1,2-Dichloroethene	ND	31	ug/L
1,2-Dichloropropane	ND	31	ug/L
cis-1,3-Dichloropropene	ND	31	ug/L
trans-1,3-Dichloropropene	ND	31	ug/L
Ethylbenzene	ND	31	ug/L
2-Hexanone	ND	160	ug/L
Methylene chloride	ND	62	ug/L
4-Methyl-2-pentanone	ND	31	ug/L
Styrene	ND	31	ug/L
1,1,2,2-Tetrachloroethane	ND	31	ug/L
Tetrachloroethene	**420**	**31**	**ug/L**
Toluene	ND	31	ug/L
1,1,1-Trichloroethane	ND	31	ug/L
1,1,2-Trichloroethane	ND	31	ug/L
Trichloroethene	**660**	**31**	**ug/L**

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RMT

Client Sample ID: GW-32/33-504-001015

GC/MS Volatiles

Lot-Sample #...: A0J170140-001 Work Order #...: DM9MW1AA Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Vinyl chloride	ND	31	ug/L
Xylenes (total)	ND	31	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	108	(80 - 120)

RMT

Client Sample ID: TRIP BLANK

GC/MS Volatiles

Lot-Sample #...: A0J190227-002 Work Order #...: DNFG61AA Matrix.....: WQ
Date Sampled...: 10/18/00 Date Received..: 10/19/00
Prep Date.....: 10/20/00 Analysis Date..: 10/20/00
Prep Batch #...: 0298160
Dilution Factor: 1 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	5.0	ug/L
Benzene	ND	1.0	ug/L
Bromochloromethane	ND	1.0	ug/L
Bromodichloromethane	**0.12 J**	**1.0**	**ug/L**
Bromoform	ND	1.0	ug/L
Bromomethane	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
2-Butanone	ND	5.0	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
1,2-Dibromo-3-chloro-propane	ND	2.0	ug/L
Chloroethane	ND	1.0	ug/L
Chloroform	**0.28 J**	**1.0**	**ug/L**
Chloromethane	ND	1.0	ug/L
1,2-Dibromoethane	ND	1.0	ug/L
1,2-Dichlorobenzene	ND	1.0	ug/L
1,3-Dichlorobenzene	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
cis-1,2-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	1.0	ug/L
1,4-Dichlorobenzene	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
2-Hexanone	ND	5.0	ug/L
Methylene chloride	ND	2.0	ug/L
4-Methyl-2-pentanone	ND	1.0	ug/L
Styrene	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L

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RMT

Client Sample ID: TRIP BLANK

GC/MS Volatiles

Lot-Sample #...: A0J190227-002 Work Order #...: DNFG61AA Matrix.....: WQ

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Vinyl chloride	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	105	(80 - 120)

NOTE(S):

J Estimated result. Result is less than RL.

RMT

Client Sample ID: I-1-23 MPE HR. 1

GC/MS Volatiles

Lot-Sample #...: A0J240197-003 Work Order #...: DNM601AA Matrix.....: WG
Date Sampled...: 10/22/00 08:45 Date Received..: 10/24/00
Prep Date.....: 10/27/00 Analysis Date..: 10/27/00
Prep Batch #...: 0304224
Dilution Factor: 16.67 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	**56 J**	**83**	**ug/L**
Benzene	ND	17	ug/L
Bromochloromethane	ND	17	ug/L
Bromodichloromethane	ND	17	ug/L
Bromoform	ND	17	ug/L
Bromomethane	ND	17	ug/L
2-Butanone	**900**	**83**	**ug/L**
Carbon disulfide	ND	17	ug/L
Carbon tetrachloride	ND	17	ug/L
Chlorobenzene	ND	17	ug/L
Dibromochloromethane	ND	17	ug/L
1,2-Dibromo-3-chloro-propane	ND	33	ug/L
Chloroethane	ND	17	ug/L
Chloroform	ND	17	ug/L
Chloromethane	ND	17	ug/L
1,2-Dibromoethane	ND	17	ug/L
1,2-Dichlorobenzene	ND	17	ug/L
1,3-Dichlorobenzene	ND	17	ug/L
1,4-Dichlorobenzene	ND	17	ug/L
1,1-Dichloroethane	ND	17	ug/L
1,2-Dichloroethane	ND	17	ug/L
1,1-Dichloroethene	ND	17	ug/L
cis-1,2-Dichloroethene	ND	17	ug/L
trans-1,2-Dichloroethene	ND	17	ug/L
1,2-Dichloropropane	ND	17	ug/L
cis-1,3-Dichloropropene	ND	17	ug/L
trans-1,3-Dichloropropene	ND	17	ug/L
Ethylbenzene	ND	17	ug/L
2-Hexanone	ND	83	ug/L
Methylene chloride	ND	33	ug/L
4-Methyl-2-pentanone	ND	17	ug/L
Styrene	ND	17	ug/L
1,1,2,2-Tetrachloroethane	ND	17	ug/L
Tetrachloroethene	**2.4 J**	**17**	**ug/L**
Toluene	ND	17	ug/L
1,1,1-Trichloroethane	ND	17	ug/L
1,1,2-Trichloroethane	ND	17	ug/L
Trichloroethene	**37**	**17**	**ug/L**

(Continued on next page)

RMT

Client Sample ID: I-1-23 MPE BR. 1

GC/MS Volatiles

Lot-Sample #...: A0J240197-003 Work Order #...: DNM601AA Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Vinyl chloride	ND	17	ug/L
Xylenes (total)	ND	17	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	90	(80 - 120)

NOTE(S):

J Estimated result. Result is less than RL.

RMT

Client Sample ID: I-1-23 TEST END

GC/MS Volatiles

Lot-Sample #...: A0J260297-001 Work Order #...: DNVXN1AA Matrix.....: WG
Date Sampled...: 10/25/00 15:00 Date Received..: 10/26/00
Prep Date.....: 10/27/00 Analysis Date..: 10/27/00
Prep Batch #...: 0304224
Dilution Factor: 62.5 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	310	ug/L
Benzene	ND	62	ug/L
Bromochloromethane	ND	62	ug/L
Bromodichloromethane	ND	62	ug/L
Bromoform	ND	62	ug/L
Carbon tetrachloride	ND	62	ug/L
Chlorobenzene	**7.6 J**	**62**	**ug/L**
Bromomethane	ND	62	ug/L
2-Butanone	ND	310	ug/L
Carbon disulfide	ND	62	ug/L
Dibromochloromethane	ND	62	ug/L
1,2-Dibromo-3-chloro-propane	ND	120	ug/L
Chloroethane	ND	62	ug/L
Chloroform	ND	62	ug/L
Chloromethane	ND	62	ug/L
1,2-Dibromoethane	ND	62	ug/L
1,2-Dichlorobenzene	**28 J**	**62**	**ug/L**
1,3-Dichlorobenzene	ND	62	ug/L
1,4-Dichlorobenzene	**29 J**	**62**	**ug/L**
1,1-Dichloroethane	ND	62	ug/L
1,2-Dichloroethane	ND	62	ug/L
1,1-Dichloroethene	ND	62	ug/L
cis-1,2-Dichloroethene	**7.1 J**	**62**	**ug/L**
trans-1,2-Dichloroethene	ND	62	ug/L
1,2-Dichloropropane	ND	62	ug/L
cis-1,3-Dichloropropene	ND	62	ug/L
trans-1,3-Dichloropropene	ND	62	ug/L
Ethylbenzene	ND	62	ug/L
2-Hexanone	ND	310	ug/L
Methylene chloride	ND	120	ug/L
4-Methyl-2-pentanone	ND	62	ug/L
Styrene	ND	62	ug/L
1,1,2,2-Tetrachloroethane	ND	62	ug/L
Tetrachloroethene	**73**	**62**	**ug/L**
Toluene	ND	62	ug/L
1,1,1-Trichloroethane	ND	62	ug/L
1,1,2-Trichloroethane	ND	62	ug/L
Trichloroethene	**230**	**62**	**ug/L**

(Continued on next page)

RMT

Client Sample ID: I-1-23 TEST END

GC/MS Volatiles

Lot-Sample #...: A0J260297-001 Work Order #...: DNVXN1AA Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Vinyl chloride	ND	62	ug/L
Xylenes (total)	ND	62	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	92	(80 - 120)

NOTE(S):

J Estimated result. Result is less than RL.

Elevated reporting limits due to TICs.

RMT

Client Sample ID: I-1-23-24HR VC-US

GC/MS Volatiles

Lot-Sample #...: A0J240197-002 Work Order #...: DNM6T1AA Matrix.....: WG
Date Sampled...: 10/23/00 08:45 Date Received..: 10/24/00
Prep Date.....: 10/27/00 Analysis Date..: 10/27/00
Prep Batch #...: 0304224
Dilution Factor: 6.25 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	31	ug/L
Benzene	ND	6.2	ug/L
Bromochloromethane	ND	6.2	ug/L
Bromodichloromethane	ND	6.2	ug/L
Bromoform	ND	6.2	ug/L
Bromomethane	ND	6.2	ug/L
2-Butanone	ND	31	ug/L
Carbon disulfide	ND	6.2	ug/L
Carbon tetrachloride	ND	6.2	ug/L
Chlorobenzene	**4.8 J**	**6.2**	**ug/L**
Dibromochloromethane	ND	6.2	ug/L
1,2-Dibromo-3-chloro-propane	ND	12	ug/L
Chloroethane	ND	6.2	ug/L
Chloroform	ND	6.2	ug/L
Chloromethane	ND	6.2	ug/L
1,2-Dibromoethane	ND	6.2	ug/L
1,2-Dichlorobenzene	**2.6 J**	**6.2**	**ug/L**
1,3-Dichlorobenzene	ND	6.2	ug/L
1,4-Dichlorobenzene	**2.4 J**	**6.2**	**ug/L**
1,1-Dichloroethane	ND	6.2	ug/L
1,2-Dichloroethane	ND	6.2	ug/L
1,1-Dichloroethene	ND	6.2	ug/L
cis-1,2-Dichloroethene	**4.7 J**	**6.2**	**ug/L**
trans-1,2-Dichloroethene	ND	6.2	ug/L
1,2-Dichloropropane	ND	6.2	ug/L
cis-1,3-Dichloropropene	ND	6.2	ug/L
trans-1,3-Dichloropropene	ND	6.2	ug/L
Ethylbenzene	ND	6.2	ug/L
2-Hexanone	ND	31	ug/L
Methylene chloride	ND	12	ug/L
4-Methyl-2-pentanone	ND	6.2	ug/L
Styrene	ND	6.2	ug/L
1,1,2,2-Tetrachloroethane	ND	6.2	ug/L
Tetrachloroethene	**4.2 J**	**6.2**	**ug/L**
Toluene	ND	6.2	ug/L
1,1,1-Trichloroethane	ND	6.2	ug/L
1,1,2-Trichloroethane	ND	6.2	ug/L
Trichloroethene	**88**	**6.2**	**ug/L**

(Continued on next page)

RMT

Client Sample ID: I-1-23-24HR VC-US

GC/MS Volatiles

Lot-Sample #...: A0J240197-002 Work Order #...: DNM6T1AA Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Vinyl chloride	ND	6.2	ug/L
Xylenes (total)	ND	6.2	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	93	(80 - 120)

NOTE(S):

J Estimated result. Result is less than RL.

RMT

Client Sample ID: REPOSITORY TEST END

GC/MS Volatiles

Lot-Sample #...: A0J240197-001 Work Order #...: DNM5V1AA Matrix.....: WG
Date Sampled...: 10/21/00 08:03 Date Received..: 10/24/00
Prep Date.....: 10/27/00 Analysis Date..: 10/27/00
Prep Batch #...: 0304224
Dilution Factor: 10 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Toluene	**1.5 J**	**10**	**ug/L**
1,1,1-Trichloroethane	ND	10	ug/L
1,1,2-Trichloroethane	ND	10	ug/L
Trichloroethene	**140**	**10**	**ug/L**
Vinyl chloride	ND	10	ug/L
Xylenes (total)	ND	10	ug/L
Acetone	ND	50	ug/L
Benzene	ND	10	ug/L
Bromochloromethane	ND	10	ug/L
Bromodichloromethane	ND	10	ug/L
2-Butanone	**100**	**50**	**ug/L**
Carbon disulfide	ND	10	ug/L
Carbon tetrachloride	ND	10	ug/L
Bromoform	ND	10	ug/L
Bromomethane	ND	10	ug/L
Chlorobenzene	ND	10	ug/L
Dibromochloromethane	ND	10	ug/L
1,2-Dibromo-3-chloro-propane	ND	20	ug/L
Chloroethane	ND	10	ug/L
Chloroform	ND	10	ug/L
Chloromethane	ND	10	ug/L
1,2-Dibromoethane	ND	10	ug/L
1,2-Dichlorobenzene	ND	10	ug/L
1,3-Dichlorobenzene	ND	10	ug/L
1,4-Dichlorobenzene	ND	10	ug/L
1,1-Dichloroethane	ND	10	ug/L
1,2-Dichloroethane	ND	10	ug/L
1,1-Dichloroethene	ND	10	ug/L
cis-1,2-Dichloroethene	**2.8 J**	**10**	**ug/L**
trans-1,2-Dichloroethene	ND	10	ug/L
1,2-Dichloropropane	ND	10	ug/L
cis-1,3-Dichloropropene	ND	10	ug/L
trans-1,3-Dichloropropene	ND	10	ug/L
Ethylbenzene	ND	10	ug/L
2-Hexanone	ND	50	ug/L
Methylene chloride	ND	20	ug/L
4-Methyl-2-pentanone	ND	10	ug/L
Styrene	**12**	**10**	**ug/L**

(Continued on next page)

RMT

Client Sample ID: REPOSITORY TEST END

GC/MS Volatiles

Lot-Sample #...: A0J240197-001 Work Order #...: DNM5V1AA Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
1,1,2,2-Tetrachloroethane	ND	10	ug/L
Tetrachloroethene	ND	10	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	89	(80 - 120)

NOTE(S):

J Estimated result. Result is less than RL.

RMT

Client Sample ID: REPOSITORY, US 10/17/00

GC/MS Volatiles

Lot-Sample #...: A0J180250-005 Work Order #...: DNC4D1AA Matrix.....: WG
Date Sampled...: 10/17/00 15:40 Date Received..: 10/18/00
Prep Date.....: 10/20/00 Analysis Date..: 10/20/00
Prep Batch #...: 0298160
Dilution Factor: 20 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	100	ug/L
Benzene	ND	20	ug/L
Bromochloromethane	ND	20	ug/L
Bromodichloromethane	ND	20	ug/L
Bromoform	ND	20	ug/L
Bromomethane	ND	20	ug/L
2-Butanone	**1600**	**100**	**ug/L**
Carbon disulfide	ND	20	ug/L
Carbon tetrachloride	ND	20	ug/L
Chlorobenzene	ND	20	ug/L
Dibromochloromethane	ND	20	ug/L
1,2-Dibromo-3-chloro-propane	ND	40	ug/L
Chloroethane	ND	20	ug/L
Chloroform	ND	20	ug/L
Chloromethane	ND	20	ug/L
1,2-Dibromoethane	ND	20	ug/L
1,2-Dichlorobenzene	ND	20	ug/L
1,3-Dichlorobenzene	ND	20	ug/L
1,4-Dichlorobenzene	ND	20	ug/L
1,1-Dichloroethane	ND	20	ug/L
1,2-Dichloroethane	ND	20	ug/L
1,1-Dichloroethene	ND	20	ug/L
cis-1,2-Dichloroethene	ND	20	ug/L
trans-1,2-Dichloroethene	ND	20	ug/L
1,2-Dichloropropane	ND	20	ug/L
cis-1,3-Dichloropropene	ND	20	ug/L
trans-1,3-Dichloropropene	ND	20	ug/L
Ethylbenzene	ND	20	ug/L
2-Hexanone	ND	100	ug/L
Methylene chloride	ND	40	ug/L
4-Methyl-2-pentanone	ND	20	ug/L
Styrene	ND	20	ug/L
1,1,2,2-Tetrachloroethane	ND	20	ug/L
Tetrachloroethene	**2.4 J**	**20**	**ug/L**
Toluene	ND	20	ug/L
1,1,1-Trichloroethane	ND	20	ug/L
1,1,2-Trichloroethane	ND	20	ug/L
Trichloroethene	**29**	**20**	**ug/L**

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RMT

Client Sample ID: REPOSITORY, US 10/17/00

GC/MS Volatiles

Lot-Sample #...: A0J180250-005 Work Order #...: DNC4D1AA Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Vinyl chloride	ND	20	ug/L
Xylenes (total)	ND	20	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	112	(80 - 120)

NOTE(S):

J Estimated result. Result is less than RL.

RMT

Client Sample ID: REPOSITORY US-UCI

GC/MS Volatiles

Lot-Sample #...: A0J200230-001 Work Order #...: DNH491AA Matrix.....: WG
Date Sampled...: 10/18/00 14:10 Date Received..: 10/20/00
Prep Date.....: 10/27/00 Analysis Date..: 10/27/00
Prep Batch #...: 0304224
Dilution Factor: 10 Method.....: OCLP OLC02.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	**42 J**	**50**	**ug/L**
Benzene	ND	10	ug/L
Bromochloromethane	ND	10	ug/L
Bromodichloromethane	ND	10	ug/L
Bromoform	ND	10	ug/L
Bromomethane	ND	10	ug/L
2-Butanone	**760**	**50**	**ug/L**
Carbon disulfide	ND	10	ug/L
Carbon tetrachloride	ND	10	ug/L
Chlorobenzene	ND	10	ug/L
Dibromochloromethane	ND	10	ug/L
1,2-Dibromo-3-chloro-propane	ND	20	ug/L
Chloroethane	ND	10	ug/L
Chloroform	ND	10	ug/L
Chloromethane	ND	10	ug/L
1,2-Dibromoethane	ND	10	ug/L
1,2-Dichlorobenzene	ND	10	ug/L
1,3-Dichlorobenzene	ND	10	ug/L
1,4-Dichlorobenzene	ND	10	ug/L
1,1-Dichloroethane	ND	10	ug/L
1,2-Dichloroethane	ND	10	ug/L
1,1-Dichloroethene	ND	10	ug/L
cis-1,2-Dichloroethene	**5.0 J**	**10**	**ug/L**
trans-1,2-Dichloroethene	ND	10	ug/L
1,2-Dichloropropane	ND	10	ug/L
cis-1,3-Dichloropropene	ND	10	ug/L
trans-1,3-Dichloropropene	ND	10	ug/L
Ethylbenzene	ND	10	ug/L
2-Hexanone	ND	50	ug/L
Methylene chloride	**2.9 J,B**	**20**	**ug/L**
4-Methyl-2-pentanone	ND	10	ug/L
Styrene	ND	10	ug/L
1,1,2,2-Tetrachloroethane	ND	10	ug/L
Tetrachloroethene	ND	10	ug/L
Toluene	ND	10	ug/L
1,1,1-Trichloroethane	ND	10	ug/L
1,1,2-Trichloroethane	ND	10	ug/L
Trichloroethene	**88**	**10**	**ug/L**

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RMT

Client Sample ID: REPOSITORY US-UCI

GC/MS Volatiles

Lot-Sample #...: A0J200230-001 Work Order #...: DNH491AA Matrix.....: WG

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Vinyl chloride	ND	10	ug/L
Xylenes (total)	ND	10	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	96	(80 - 120)

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Dissolved Gases Data Sheets

RMT

Client Sample ID: GW-32/33-301-001016

GC Volatiles

Lot-Sample #...: A0J170140-002 Work Order #...: DM9M71AK Matrix.....: WG
Date Sampled...: 10/16/00 12:46 Date Received..: 10/17/00
Prep Date.....: 10/25/00 Analysis Date..: 10/25/00
Prep Batch #...: 0300322
Dilution Factor: 1 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Ethane	9.5	0.50	ug/L
Ethene	2.6	0.50	ug/L
Methane	380 E	0.50	ug/L

NOTE(S):

E Estimated result. Result concentration exceeds the calibration range.

RMT

Client Sample ID: GW-32/33-301-001016

GC Volatiles

Lot-Sample #...: A0J170140-002 Work Order #...: DM9M72AK Matrix.....: WG
Date Sampled...: 10/16/00 12:46 Date Received..: 10/17/00
Prep Date.....: 10/25/00 Analysis Date..: 10/25/00
Prep Batch #...: 0300322
Dilution Factor: 20 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Ethane	ND D	10	ug/L
Ethene	ND	10	ug/L
Methane	440 D	10	ug/L

NOTE(S):

D Result was obtained from the analysis of a dilution.

RMT

Client Sample ID: GW32/33-302-001018

GC Volatiles

Lot-Sample #...: A0J190227-001 Work Order #...: DNFGC1AK Matrix.....: WG
Date Sampled...: 10/18/00 08:15 Date Received..: 10/19/00
Prep Date.....: 10/31/00 Analysis Date..: 11/01/00
Prep Batch #...: 0309138
Dilution Factor: 1 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Ethane	6.8	0.50	ug/L
Ethene	1.4	0.50	ug/L
Methane	94 E	0.50	ug/L

NOTE(S):

E Estimated result. Result concentration exceeds the calibration range.

RMT

Client Sample ID: GW32/33-302-001018

GC Volatiles

Lot-Sample #...: A0J190227-001 Work Order #...: DNFGC2AK Matrix.....: WG
Date Sampled...: 10/18/00 08:15 Date Received..: 10/19/00
Prep Date.....: 10/31/00 Analysis Date..: 11/01/00
Prep Batch #...: 0309138
Dilution Factor: 2 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Ethane	6.7 D	1.0	ug/L
Ethene	1.4 D	1.0	ug/L
Methane	94 D	1.0	ug/L

NOTE(S):

D Result was obtained from the analysis of a dilution.

RMT

Client Sample ID: GW32/33-303-001017

GC Volatiles

Lot-Sample #...: A0J180250-003 Work Order #...: DNC391AC Matrix.....: WG
Date Sampled...: 10/17/00 16:30 Date Received..: 10/18/00
Prep Date.....: 10/30/00 Analysis Date..: 10/30/00
Prep Batch #...: 0306428
Dilution Factor: 1 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Ethene	20	0.50	ug/L
Methane	500 E	0.50	ug/L
Ethane	23	0.50	ug/L

NOTE(S):

E Estimated result. Result concentration exceeds the calibration range.

RMT

Client Sample ID: GW32/33-303-001017

GC Volatiles

Lot-Sample #...: A0J180250-003 Work Order #...: DNC392AC Matrix.....: WG
Date Sampled...: 10/17/00 16:30 Date Received..: 10/18/00
Prep Date.....: 10/30/00 Analysis Date..: 10/30/00
Prep Batch #...: 0306428
Dilution Factor: 40 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Ethane	ND D	20	ug/L
Ethene	ND D	20	ug/L
Methane	1200 D	20	ug/L

NOTE(S):

D Result was obtained from the analysis of a dilution.

RMT

Client Sample ID: FDUP32/33-100-001017

GC Volatiles

Lot-Sample #...: A0J180250-004 Work Order #...: DNC4A1AC Matrix.....: WG
Date Sampled...: 10/17/00 Date Received..: 10/18/00
Prep Date.....: 10/30/00 Analysis Date..: 10/30/00
Prep Batch #...: 0306428
Dilution Factor: 1 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Ethane	21	0.50	ug/L
Ethene	25	0.50	ug/L
Methane	480 E	0.50	ug/L

NOTE(S):

E Estimated result. Result concentration exceeds the calibration range.

RMT

Client Sample ID: FDUP32/33-100-001017

GC Volatiles

Lot-Sample #...: A0J180250-004 Work Order #...: DNC4A2AC Matrix.....: WG
Date Sampled...: 10/17/00 Date Received..: 10/18/00
Prep Date.....: 10/30/00 Analysis Date..: 10/30/00
Prep Batch #...: 0306428
Dilution Factor: 40 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methane	1400 D	20	ug/L
Ethane	ND D	20	ug/L
Ethene	ND D	20	ug/L

NOTE(S):

D Result was obtained from the analysis of a dilution.

RMT

Client Sample ID: GW32/33-502-001017

GC Volatiles

Lot-Sample #...: A0J180250-001 Work Order #...: DNC3E1A4 Matrix.....: WG
Date Sampled...: 10/17/00 13:55 Date Received..: 10/18/00
Prep Date.....: 10/30/00 Analysis Date..: 10/30/00
Prep Batch #...: 0306428
Dilution Factor: 1 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Ethane	ND	0.50	ug/L
Ethene	ND	0.50	ug/L
Methane	6.5	0.50	ug/L

RMT

Client Sample ID: GW32/33-503-001017

GC Volatiles

Lot-Sample #...: A0J180250-002 Work Order #...: DNC371AC Matrix.....: WG
Date Sampled...: 10/17/00 15:30 Date Received..: 10/18/00
Prep Date.....: 10/30/00 Analysis Date..: 10/30/00
Prep Batch #...: 0306428
Dilution Factor: 1 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Ethane	ND	0.50	ug/L
Ethene	ND	0.50	ug/L
Methane	31	0.50	ug/L

RMT

Client Sample ID: GW-32/33-504-001015

GC Volatiles

Lot-Sample #...: A0J170140-001 Work Order #...: DM9MW1AK Matrix.....: WG
Date Sampled...: 10/15/00 17:20 Date Received..: 10/17/00
Prep Date.....: 10/25/00 Analysis Date..: 10/25/00
Prep Batch #...: 0300322
Dilution Factor: 1 Method.....: RSK SOP-175

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Ethane	ND	0.50	ug/L
Ethene	ND	0.50	ug/L
Methane	39	0.50	ug/L

Wet Chemistry Data Sheets

RMT

Client Sample ID: GW32/33-128-000929

General Chemistry

Lot-Sample #...: A0J020134-001 **Work Order #...:** DLDRM **Matrix.....:** WG
Date Sampled...: 09/29/00 15:55 **Date Received..:** 10/02/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	**760**	**20.0**	**mg/L**	**MCAWW 300.0A**	**10/10/00**	**0285420**
	Dilution Factor: 20					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	10/04/00	0278385
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	10/02/00	0276502
	Dilution Factor: 1					
Sulfate	**2260**	**20.0**	**mg/L**	**MCAWW 300.0A**	**10/10/00**	**0285417**
	Dilution Factor: 20					
Total Alkalinity	**570**	**5.0**	**mg/L**	**MCAWW 310.1**	**10/03/00**	**0277180**
	Dilution Factor: 1					
Total Dissolved Solids	**4500**	**40**	**mg/L**	**MCAWW 160.1**	**10/05-10/06/00**	**0279113**
	Dilution Factor: 4					
Total Organic Carbon	**4**	**1**	**mg/L**	**SW846 9060**	**10/09/00**	**0284154**
	Dilution Factor: 1					

RMT

Client Sample ID: GW-32/33-301-001016

General Chemistry

Lot-Sample #...: A0J170140-002 Work Order #...: DM9M7 Matrix.....: WG
Date Sampled...: 10/16/00 12:46 Date Received..: 10/17/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	12.2	1.0	mg/L	MCAWW 300.0A	10/25/00	0299180
	Dilution Factor: 1					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	10/18/00	0292410
	Dilution Factor: 1					
Nitrogen, as Ammonia	0.2	0.2	mg/L	MCAWW 350.3	10/17/00	0292091
	Dilution Factor: 1					
Sulfate	34.3	1.0	mg/L	MCAWW 300.0A	10/25/00	0299177
	Dilution Factor: 1					
Total Alkalinity	280	5.0	mg/L	MCAWW 310.1	10/24/00	0299133
	Dilution Factor: 1					
Total Dissolved Solids	720	10	mg/L	MCAWW 160.1	10/21-10/23/00	0295[illegible]
	Dilution Factor: 1					
Total Organic Carbon	2	1	mg/L	SW846 9060	10/21/00	0299256
	Dilution Factor: 1					

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RMT

Client Sample ID: GW32/33-302-001018

General Chemistry

Lot-Sample #...: A0J190227-001 Work Order #...: DNFGC Matrix.....: WG
Date Sampled...: 10/18/00 08:15 Date Received..: 10/19/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	13.4	1.0	mg/L	MCAWW 300.0A	11/03/00	0311193
	Dilution Factor: 1					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/01/00	0307410
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	10/26/00	0300552
	Dilution Factor: 1					
Sulfate	26.1	1.0	mg/L	MCAWW 300.0A	11/03/00	0311227
	Dilution Factor: 1					
Total Alkalinity	570	5.0	mg/L	MCAWW 310.1	10/24/00	0299130
	Dilution Factor: 1					
Total Dissolved Solids	520	10	mg/L	MCAWW 160.1	10/23-10/25/00	0297237
	Dilution Factor: 1					
Total Organic Carbon	3	1	mg/L	SW846 9060	10/21/00	0299256
	Dilution Factor: 1					

75

EMT

Client Sample ID: GW32/33-303-001017

General Chemistry

Lot-Sample #...: A0J180250-003 Work Order #...: DNC39 Matrix.....: WG
Date Sampled...: 10/17/00 16:30 Date Received..: 10/18/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	25.4	2.0	mg/L	MCAWW 300.0A	10/31/00	0307249
	Dilution Factor: 2					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/01/00	0306126
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	10/26/00	0300552
	Dilution Factor: 1					
Sulfate	26.0	2.0	mg/L	MCAWW 300.0A	10/31/00	0307255
	Dilution Factor: 2					
Total Alkalinity	290	5.0	mg/L	MCAWW 310.1	10/24/00	0299133
	Dilution Factor: 1					
Total Dissolved Solids	370	10	mg/L	MCAWW 160.1	10/21-10/23/00	0295[illegible]
	Dilution Factor: 1					
Total Organic Carbon	2	1	mg/L	SW846 9060	10/21/00	0299256
	Dilution Factor: 1					

EMT

Client Sample ID: FDUP32/33-100-001017

General Chemistry

Lot-Sample #...: A0J180250-004 Work Order #...: DNC4A Matrix.....: WG
Date Sampled...: 10/17/00 Date Received..: 10/18/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	26.0	2.0	mg/L	MCAWW 300.0A	10/31/00	0307249
	Dilution Factor: 2					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/01/00	0306126
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	10/26/00	0300552
	Dilution Factor: 1					
Sulfate	26.4	2.0	mg/L	MCAWW 300.0A	10/31/00	0307255
	Dilution Factor: 2					
Total Alkalinity	520	5.0	mg/L	MCAWW 310.1	10/24/00	0299130
	Dilution Factor: 1					
Total Dissolved Solids	590	10	mg/L	MCAWW 160.1	10/21-10/23/00	0295194
	Dilution Factor: 1					
Total Organic Carbon	3	1	mg/L	SW846 9060	10/21/00	0299256
	Dilution Factor: 1					

RMT

Client Sample ID: GW32/33-502-001017

General Chemistry

Lot-Sample #...: A0J180250-001 Work Order #...: DNC3E Matrix.....: WG
Date Sampled...: 10/17/00 13:55 Date Received..: 10/18/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	48.8	1.0	mg/L	MCAWW 300.0A	11/02/00	0311193
	Dilution Factor: 1					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/01/00	0306126
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	10/26/00	0300552
	Dilution Factor: 1					
Sulfate	667	5.0	mg/L	MCAWW 300.0A	10/31/00	0307255
	Dilution Factor: 5					
Total Alkalinity	280	5.0	mg/L	MCAWW 310.1	10/24/00	0299133
	Dilution Factor: 1					
Total Dissolved Solids	2200	10	mg/L	MCAWW 160.1	10/21-10/23/00	0295194
	Dilution Factor: 1					
Total Organic Carbon	2	1	mg/L	SW846 9060	10/21/00	0299256
	Dilution Factor: 1					

EMT

Client Sample ID: GW32/33-503-001017

General Chemistry

Lot-Sample #...: A0J180250-002 Work Order #...: DNC37 Matrix.....: WG
Date Sampled...: 10/17/00 15:30 Date Received..: 10/18/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	36.9	2.0	mg/L	MCAWW 300.0A	10/31/00	0307249
	Dilution Factor: 2					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	11/01/00	0306126
	Dilution Factor: 1					
Nitrogen, as Ammonia	ND	0.2	mg/L	MCAWW 350.3	10/26/00	0300552
	Dilution Factor: 1					
Sulfate	199	2.0	mg/L	MCAWW 300.0A	10/31/00	0307255
	Dilution Factor: 2					
Total Alkalinity	300	5.0	mg/L	MCAWW 310.1	10/24/00	0299133
	Dilution Factor: 1					
Total Dissolved Solids	1000	10	mg/L	MCAWW 160.1	10/21-10/23/00	0295194
	Dilution Factor: 1					
Total Organic Carbon	2	1	mg/L	SW846 9060	10/21/00	0299256
	Dilution Factor: 1					

EMT

Client Sample ID: GW-32/33-504-001015

General Chemistry

Lot-Sample #...: A0J170140-001 Work Order #...: DM9MW Matrix.....: WG
Date Sampled...: 10/15/00 17:20 Date Received..: 10/17/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Chloride	55.3	1.0	mg/L	MCAWW 300.0A	10/25/00	0299180
	Dilution Factor: 1					
Nitrate-Nitrite	ND	0.1	mg/L	MCAWW 353.2	10/18/00	0292410
	Dilution Factor: 1					
Nitrogen, as Ammonia	0.4	0.2	mg/L	MCAWW 350.3	10/17/00	0292091
	Dilution Factor: 1					
Sulfate	605	5.0	mg/L	MCAWW 300.0A	10/25/00	0299177
	Dilution Factor: 5					
Total Alkalinity	280	5.0	mg/L	MCAWW 310.1	10/24/00	0299133
	Dilution Factor: 1					
Total Dissolved Solids	1400	10	mg/L	MCAWW 160.1	10/21-10/23/00	0295194
	Dilution Factor: 1					
Total Organic Carbon	2	1	mg/L	SW846 9060	10/21/00	0299256
	Dilution Factor: 1					

80/80

Appendix O
Pilot Test Air Sampling Laboratory Data

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0010307

Work Order Summary

CLIENT:	Mr. Jack Anderson RMT, Inc. 744 Heartland Trail Madison, WI 53717	**BILL TO:**	Mr. Mike DeBraske RMT, Inc. Renaissance Plaza 4351 W College Ave. Appleton, WI 54914
PHONE:	608-831-4444	**P.O. #**	
FAX:	608-831-3334	**PROJECT #**	4781.06 Crab Orchard National Wildlife Refuge
DATE RECEIVED:	10/18/00		
DATE COMPLETED:	11/1/00		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	Repository VS 10/17/00 1545	TO-14	5.0 "Hg
02A	Repository VS 10/17/00 1625	TO-14	3.0 "Hg
03A	Lab Blank	TO-14	NA
03B	Lab Blank	TO-14	NA

CERTIFIED BY: _____ Laboratory Director

DATE: 11/1/00

Certification numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

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LABORATORY NARRATIVE
TO-14
RMT, Inc.
Workorder# 0010307

Two 1 Liter Summa Canister samples were received on October 18, 2000. The laboratory performed analysis via EPA Method TO-14 using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

During the five point calibration, two low-level standards are used. The low-level standard for TO-14 compounds is spiked at 0.5 ppbv and represents the reporting limit for these compounds. The low-level standard for the non-TO-14 compounds is spiked at 2.0 ppbv and represents the reporting limit for these compounds. The TO-14 compounds are present in both standards but are excluded from reporting in the 2.0 ppbv standard since a lower level is already included in the curve.

Method modifications taken to run these samples include:

Requirement	*TO-14*	*ATL Modifications*
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal standard recoveries.	Not specified.	Within 40% of the daily CCV internal standard area for blanks and samples.
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal calibration criteria.	Not specified.	RSD of 30% or less for standard compounds, 40% or less for non-standard and polar compounds
Continuing calibration verification criteria	Not specified.	70 - 130% for at least 90% of standard compounds, 60 - 140% for at least 80% of non-standard and polar compounds
Response factor for quantitation.	Average response factor (ICAL).	Average response factor (ICAL).

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit(background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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U - Compound analyzed for but not detected above the reporting limit.
N - The identification is based on presumptive evidence.

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AIR TOXICS LTD.

SAMPLE NAME : Repository VS 10/17/00 1545

ID#: 0010307-01A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c102714	Date of Collection:	10/17/00
Dil. Factor:	32.3	Date of Analysis:	10/27/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	16	81	Not Detected	Not Detected
Freon 114	16	110	Not Detected	Not Detected
Chloromethane	16	34	Not Detected	Not Detected
Vinyl Chloride	16	42	Not Detected	Not Detected
Bromomethane	16	64	Not Detected	Not Detected
Chloroethane	16	43	Not Detected	Not Detected
Freon 11	16	92	Not Detected	Not Detected
1,1-Dichloroethene	16	65	Not Detected	Not Detected
Freon 113	16	120	Not Detected	Not Detected
Methylene Chloride	16	57	Not Detected	Not Detected
1,1-Dichloroethane	16	66	Not Detected	Not Detected
cis-1,2-Dichloroethene	16	65	120	470
Chloroform	16	80	Not Detected	Not Detected
1,1,1-Trichloroethane	16	90	Not Detected	Not Detected
Carbon Tetrachloride	16	100	Not Detected	Not Detected
Benzene	16	52	Not Detected	Not Detected
1,2-Dichloroethane	16	66	Not Detected	Not Detected
Trichloroethene	16	88	4300	24000
1,2-Dichloropropane	16	76	Not Detected	Not Detected
cis-1,3-Dichloropropene	16	74	Not Detected	Not Detected
Toluene	16	62	Not Detected	Not Detected
trans-1,3-Dichloropropene	16	74	Not Detected	Not Detected
1,1,2-Trichloroethane	16	90	Not Detected	Not Detected
Tetrachloroethene	16	110	22	150
Ethylene Dibromide	16	130	Not Detected	Not Detected
Chlorobenzene	16	76	Not Detected	Not Detected
Ethyl Benzene	16	71	Not Detected	Not Detected
m,p-Xylene	16	71	Not Detected	Not Detected
o-Xylene	16	71	Not Detected	Not Detected
Styrene	16	70	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	16	110	Not Detected	Not Detected
1,3,5-Trimethylbenzene	16	81	Not Detected	Not Detected
1,2,4-Trimethylbenzene	16	81	Not Detected	Not Detected
1,3-Dichlorobenzene	16	99	Not Detected	Not Detected
1,4-Dichlorobenzene	16	99	Not Detected	Not Detected
Chlorotoluene	16	85	Not Detected	Not Detected
1,2-Dichlorobenzene	16	99	Not Detected	Not Detected
1,2,4-Trichlorobenzene	16	120	Not Detected	Not Detected
Hexachlorobutadiene	16	180	Not Detected	Not Detected
Propylene	65	110	Not Detected	Not Detected
1,3-Butadiene	65	140	Not Detected	Not Detected
Acetone	65	160	Not Detected	Not Detected

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AIR TOXICS LTD.

SAMPLE NAME : Repository VS 10/17/00 1545

ID#: 0010307-01A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c102714	**Date of Collection:**	10/17/00
Dil. Factor:	32.3	**Date of Analysis:**	10/27/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	65	200	Not Detected	Not Detected
2-Propanol	65	160	Not Detected	Not Detected
trans-1,2-Dichloroethene	65	260	Not Detected	Not Detected
Vinyl Acetate	65	230	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	65	190	720	2100
Hexane	65	230	Not Detected	Not Detected
Tetrahydrofuran	65	190	400	1200
Cyclohexane	65	230	Not Detected	Not Detected
1,4-Dioxane	65	240	Not Detected	Not Detected
Bromodichloromethane	65	440	Not Detected	Not Detected
4-Methyl-2-pentanone	65	270	Not Detected	Not Detected
2-Hexanone	65	270	Not Detected	Not Detected
Dibromochloromethane	65	560	Not Detected	Not Detected
Bromoform	65	680	Not Detected	Not Detected
4-Ethyltoluene	65	320	Not Detected	Not Detected
Ethanol	65	120	Not Detected	Not Detected
Methyl tert-Butyl Ether	65	240	Not Detected	Not Detected
Heptane	65	270	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	100	70-130

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AIR TOXICS LTD.

SAMPLE NAME : Repository VS 10/17/00 1625

ID#: 0010307-02A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	q103011	**Date of Collection:**	10/17/00
Dil. Factor:	29.9	**Date of Analysis:**	10/30/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	15	60	86	350
Trichloroethene	15	82	2900	16000
Tetrachloroethene	15	100	16	110
Freon 113	15	120	Not Detected	Not Detected
Chlorobenzene	15	70	Not Detected	Not Detected
Toluene	15	57	Not Detected	Not Detected
Acetone	60	140	980	2400
2-Butanone (Methyl Ethyl Ketone)	60	180	370	1100

Container Type: 1 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	92	70-130

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AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 0010307-03A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c102706	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/27/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	Not Detected	Not Detected
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	Not Detected	Not Detected
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	Not Detected	Not Detected
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	Not Detected	Not Detected
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
Benzene	0.50	1.6	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Ethyl Benzene	0.50	2.2	Not Detected	Not Detected
m,p-Xylene	0.50	2.2	Not Detected	Not Detected
o-Xylene	0.50	2.2	Not Detected	Not Detected
Styrene	0.50	2.2	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected

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AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 0010307-03A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	c102706	Date of Collection:	NA
Dil Factor:	1.00	Date of Analysis:	10/27/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	Not Detected	Not Detected
Ethanol	2.0	3.8	Not Detected	Not Detected
Methyl tert-Butyl Ether	2.0	7.3	Not Detected	Not Detected
Heptane	2.0	8.3	Not Detected	Not Detected

Container Type: NA

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	109	70-130
4-Bromofluorobenzene	103	70-130

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AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 0010307-03B

EPA METHOD TO-14 GC/MS Full Scan

File Name:	q103003	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/30/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	Not Detected	Not Detected
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	Not Detected	Not Detected
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	Not Detected	Not Detected
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	Not Detected	Not Detected
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
Benzene	0.50	1.6	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Ethyl Benzene	0.50	2.2	Not Detected	Not Detected
m,p-Xylene	0.50	2.2	Not Detected	Not Detected
o-Xylene	0.50	2.2	Not Detected	Not Detected
Styrene	0.50	2.2	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected

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AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 0010307-03B

EPA METHOD TO-14 GC/MS Full Scan

File Name:	q103003	**Date of Collection: NA**	
Dil Factor:	1.00	**Date of Analysis: 10/30/00**	

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	Not Detected	Not Detected
Ethanol	2.0	3.8	Not Detected	Not Detected
Methyl tert-Butyl Ether	2.0	7.3	Not Detected	Not Detected
Heptane	2.0	8.3	Not Detected	Not Detected

Container Type: NA

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	96	70-130

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Jack Anderson
Company: RMT
Address: 744 Heartland Trail City: Madison State: WI Zip: 53717
Phone: 608-831-4444 FAX: 608-831-3334
Collected By: Signature: Daniel Hook

Project Info:
P.O. #:
Project #: #4781.06
Project Name: Crab Orchard National Wildlife Refuge

Turn Around Time:
☒ Normal
☐ Rush _____ Specify

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
01A	Repository VS 10/17/00 15:45	10/17/00 15:45	VOCs/TO-14	26.0"Hg	6.0"Hg	5.0"Hg
02A	Repository VS 10/17/00 16:25	10/17/00 16:25	Select VOCs PCE TCE cis 1,2-DCE, 2-butanone toluene acetone Freon 113 chlorobenzene	27.0"Hg	3.0"Hg	3.0"Hg

Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
Daniel Hook 10/17/00 17:00	
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time: Andrew Dorp ATL 10/18/00 9:55
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FED EX	811891137484	AS	ambient	good	Yes No (None)	0010307

Form 1293 rev. 09

10/18/00

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0010461

Work Order Summary

CLIENT:	Mr. Jack Anderson RMT, Inc. 744 Heartland Trail Madison, WI 53717	**BILL TO:**	Mr. Jack Anderson RMT, Inc. 744 Heartland Trail Madison, WI 53717
PHONE:	608-831-4444	**P.O. #**	
FAX:	608-831-3334	**PROJECT #**	4781.06 CONWR
DATE RECEIVED:	10/26/00		
DATE COMPLETED:	11/9/00		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	I-1-23 MPE Test End Effluent	TO-14	16.5 "Hg
02A	I-1-23 MPE Test End Influent	TO-14	7.5 "Hg
02AA	I-1-23 MPE Test End Influent Duplicate	TO-14	7.5 "Hg
03A	I-1-2 SVE Test End Influent	TO-14	12.5 "Hg
04A	I-1-2 SVE Test End Effluent	TO-14	11.0 "Hg
05A	I-1-2 SVE-C1 Inlet	TO-14	11.0 "Hg
06A	I-1-23-VS-VC-CI Inlet	TO-14	15.0 "Hg
07A	Method Spike	TO-14	NA
08A	Lab Blank	TO-14	NA

CERTIFIED BY: _____ Laboratory Director

DATE: 11/9/00

Certfication numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
TO-14
RMT, Inc.
Workorder# 0010461

Six 1 Liter Summa Canister samples were received on October 26, 2000. The laboratory performed analysis via EPA Method TO-14 using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

During the five point calibration, two low-level standards are used. The low-level standard for TO-14 compounds is spiked at 0.5 ppbv and represents the reporting limit for these compounds. The low-level standard for the non-TO-14 compounds is spiked at 2.0 ppbv and represents the reporting limit for these compounds. The TO-14 compounds are present in both standards but are excluded from reporting in the 2.0 ppbv standard since a lower level is already included in the curve.

Method modifications taken to run these samples include:

Requirement	*TO-14*	*ATL Modifications*
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal standard recoveries.	Not specified.	Within 40% of the daily CCV internal standard area for blanks and samples.
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal calibration criteria.	Not specified.	RSD of 30% or less for standard compounds, 40% or less for non-standard and polar compounds
Continuing calibration verification criteria	Not specified.	70 - 130% for at least 90% of standard compounds, 60 - 140% for at least 80% of non-standard and polar compounds
Response factor for quantitation.	Average response factor (ICAL).	Average response factor (ICAL).

Receiving Notes

Sample I-1-23 MPE Test End Effluent was received with significant vacuum remaining in the canister. The client was contacted and analysis proceeded. The residual canister vacuum resulted in elevated reporting limits.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit(background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

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S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit.
N - The identification is based on presumptive evidence.

AIR TOXICS LTD.

SAMPLE NAME: I-1-23 MPE Test End Effluent

ID#: 0010461-01A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110206	**Date of Collection:**	10/25/00
Dil. Factor:	18.0	**Date of Analysis:**	11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	9.0	36	Not Detected	Not Detected
Trichloroethene	9.0	49	48	260
Tetrachloroethene	9.0	62	Not Detected	Not Detected
Freon 113	9.0	70	Not Detected	Not Detected
Chlorobenzene	9.0	42	Not Detected	Not Detected
Toluene	9.0	34	Not Detected	Not Detected
Acetone	36	87	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	36	110	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	93	70-130

AIR TOXICS LTD.

SAMPLE NAME: I-1-23 MPE Test End Influent

ID#: 0010461-02A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name: q110212 Date of Collection: 10/25/00
Dil. Factor: 269 Date of Analysis: 11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	130	680	Not Detected	Not Detected
Freon 114	130	960	Not Detected	Not Detected
Chloromethane	130	280	Not Detected	Not Detected
Vinyl Chloride	130	350	Not Detected	Not Detected
Bromomethane	130	530	Not Detected	Not Detected
Chloroethane	130	360	Not Detected	Not Detected
Freon 11	130	770	Not Detected	Not Detected
1,1-Dichloroethene	130	540	Not Detected	Not Detected
Freon 113	130	1000	Not Detected	Not Detected
Methylene Chloride	130	470	Not Detected	Not Detected
1,1-Dichloroethane	130	550	Not Detected	Not Detected
cis-1,2-Dichloroethene	130	540	950	3800
Chloroform	130	670	Not Detected	Not Detected
1,1,1-Trichloroethane	130	740	Not Detected	Not Detected
Carbon Tetrachloride	130	860	Not Detected	Not Detected
Benzene	130	440	Not Detected	Not Detected
1,2-Dichloroethane	130	550	Not Detected	Not Detected
Trichloroethene	130	730	23000	120000
1,2-Dichloropropane	130	630	Not Detected	Not Detected
cis-1,3-Dichloropropene	130	620	Not Detected	Not Detected
Toluene	130	520	Not Detected	Not Detected
trans-1,3-Dichloropropene	130	620	Not Detected	Not Detected
1,1,2-Trichloroethane	130	740	Not Detected	Not Detected
Tetrachloroethene	130	930	1400	9300
Ethylene Dibromide	130	1000	Not Detected	Not Detected
Chlorobenzene	130	630	580	2700
Ethyl Benzene	130	590	Not Detected	Not Detected
m,p-Xylene	130	590	Not Detected	Not Detected
o-Xylene	130	590	Not Detected	Not Detected
Styrene	130	580	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	130	940	Not Detected	Not Detected
1,3,5-Trimethylbenzene	130	670	Not Detected	Not Detected
1,2,4-Trimethylbenzene	130	670	Not Detected	Not Detected
1,3-Dichlorobenzene	130	820	Not Detected	Not Detected
1,4-Dichlorobenzene	130	820	230	1400
Chlorotoluene	130	710	Not Detected	Not Detected
1,2-Dichlorobenzene	130	820	190	1200
1,2,4-Trichlorobenzene	130	1000	4800	36000
Hexachlorobutadiene	130	1400	Not Detected	Not Detected
Propylene	540	940	Not Detected	Not Detected
1,3-Butadiene	540	1200	Not Detected	Not Detected
Acetone	540	1300	Not Detected	Not Detected
Carbon Disulfide	540	1700	Not Detected	Not Detected
2-Propanol	540	1300	Not Detected	Not Detected

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AIR TOXICS LTD.

SAMPLE NAME: I-1-23 MPE Test End Influent

ID#: 0010461-02A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110212	**Date of Collection:**	10/25/00
Dil. Factor:	259	**Date of Analysis:**	11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
trans-1,2-Dichloroethene	540	2200	Not Detected	Not Detected
Vinyl Acetate	540	1900	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	540	1600	Not Detected	Not Detected
Hexane	540	1900	Not Detected	Not Detected
Tetrahydrofuran	540	1600	Not Detected	Not Detected
Cyclohexane	540	1900	Not Detected	Not Detected
1,4-Dioxane	540	2000	Not Detected	Not Detected
Bromodichloromethane	540	3700	Not Detected	Not Detected
4-Methyl-2-pentanone	540	2200	Not Detected	Not Detected
2-Hexanone	540	2200	Not Detected	Not Detected
Dibromochloromethane	540	4600	Not Detected	Not Detected
Bromoform	540	5600	Not Detected	Not Detected
4-Ethyltoluene	540	2700	Not Detected	Not Detected
Ethanol	540	1000	Not Detected	Not Detected
Methyl tert-Butyl Ether	540	2000	Not Detected	Not Detected
Heptane	540	2200	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	91	70-130

AIR TOXICS LTD.

SAMPLE NAME: I-1-23 MPE Test End Influent Duplicate

ID#: 0010461-02AA

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110218	**Date of Collection:**	10/25/00
Dil. Factor:	179	**Date of Analysis:**	11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	90	450	Not Detected	Not Detected
Freon 114	90	640	Not Detected	Not Detected
Chloromethane	90	190	Not Detected	Not Detected
Vinyl Chloride	90	230	Not Detected	Not Detected
Bromomethane	90	350	Not Detected	Not Detected
Chloroethane	90	240	Not Detected	Not Detected
Freon 11	90	510	Not Detected	Not Detected
1,1-Dichloroethene	90	360	Not Detected	Not Detected
Freon 113	90	700	Not Detected	Not Detected
Methylene Chloride	90	320	Not Detected	Not Detected
1,1-Dichloroethane	90	370	Not Detected	Not Detected
cis-1,2-Dichloroethene	90	360	970	3900
Chloroform	90	440	Not Detected	Not Detected
1,1,1-Trichloroethane	90	500	Not Detected	Not Detected
Carbon Tetrachloride	90	570	Not Detected	Not Detected
Benzene	90	290	Not Detected	Not Detected
1,2-Dichloroethane	90	370	Not Detected	Not Detected
Trichloroethene	90	490	24000	130000
1,2-Dichloropropane	90	420	Not Detected	Not Detected
cis-1,3-Dichloropropene	90	410	Not Detected	Not Detected
Toluene	90	340	Not Detected	Not Detected
trans-1,3-Dichloropropene	90	410	Not Detected	Not Detected
1,1,2-Trichloroethane	90	500	Not Detected	Not Detected
Tetrachloroethene	90	620	1400	9400
Ethylene Dibromide	90	700	Not Detected	Not Detected
Chlorobenzene	90	420	580	2700
Ethyl Benzene	90	390	Not Detected	Not Detected
m,p-Xylene	90	400	Not Detected	Not Detected
o-Xylene	90	400	Not Detected	Not Detected
Styrene	90	390	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	90	620	Not Detected	Not Detected
1,3,5-Trimethylbenzene	90	450	Not Detected	Not Detected
1,2,4-Trimethylbenzene	90	450	Not Detected	Not Detected
1,3-Dichlorobenzene	90	550	Not Detected	Not Detected
1,4-Dichlorobenzene	90	550	210	1300
Chlorotoluene	90	470	Not Detected	Not Detected
1,2-Dichlorobenzene	90	550	200	1200
1,2,4-Trichlorobenzene	90	680	5700	43000
Hexachlorobutadiene	90	970	Not Detected	Not Detected
Propylene	360	630	Not Detected	Not Detected
1,3-Butadiene	360	800	Not Detected	Not Detected
Acetone	360	860	Not Detected	Not Detected
Carbon Disulfide	360	1100	Not Detected	Not Detected
2-Propanol	360	890	Not Detected	Not Detected

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AIR TOXICS LTD.

SAMPLE NAME: I-1-23 MPE Test End Influent Duplicate

ID#: 0010461-02AA

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110218	**Date of Collection:**	10/25/00
Dil. Factor:	179	**Date of Analysis:**	11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
trans-1,2-Dichloroethene	360	1400	Not Detected	Not Detected
Vinyl Acetate	360	1300	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	360	1100	Not Detected	Not Detected
Hexane	360	1300	Not Detected	Not Detected
Tetrahydrofuran	360	1100	Not Detected	Not Detected
Cyclohexane	360	1200	Not Detected	Not Detected
1,4-Dioxane	360	1300	Not Detected	Not Detected
Bromodichloromethane	360	2400	Not Detected	Not Detected
4-Methyl-2-pentanone	360	1500	Not Detected	Not Detected
2-Hexanone	360	1500	Not Detected	Not Detected
Dibromochloromethane	360	3100	Not Detected	Not Detected
Bromoform	360	3800	Not Detected	Not Detected
4-Ethyltoluene	360	1800	Not Detected	Not Detected
Ethanol	360	680	Not Detected	Not Detected
Methyl tert-Butyl Ether	360	1300	Not Detected	Not Detected
Heptane	360	1500	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	95	70-130

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AIR TOXICS LTD.

SAMPLE NAME: I-1-2 SVE Test End Influent

ID#: 0010461-03A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110207	Date of Collection: 10/25/00
Dil. Factor:	13.8	Date of Analysis: 11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	6.9	35	Not Detected	Not Detected
Freon 114	6.9	49	Not Detected	Not Detected
Chloromethane	6.9	14	Not Detected	Not Detected
Vinyl Chloride	6.9	18	Not Detected	Not Detected
Bromomethane	6.9	27	Not Detected	Not Detected
Chloroethane	6.9	18	Not Detected	Not Detected
Freon 11	6.9	39	Not Detected	Not Detected
1,1-Dichloroethene	6.9	28	Not Detected	Not Detected
Freon 113	6.9	54	*150*	*1100*
Methylene Chloride	6.9	24	Not Detected	Not Detected
1,1-Dichloroethane	6.9	28	Not Detected	Not Detected
cis-1,2-Dichloroethene	6.9	28	14	54
Chloroform	6.9	34	Not Detected	Not Detected
1,1,1-Trichloroethane	6.9	38	Not Detected	Not Detected
Carbon Tetrachloride	6.9	44	Not Detected	Not Detected
Benzene	6.9	22	Not Detected	Not Detected
1,2-Dichloroethane	6.9	28	Not Detected	Not Detected
Trichloroethene	6.9	38	*190*	*1000*
1,2-Dichloropropane	6.9	32	Not Detected	Not Detected
cis-1,3-Dichloropropene	6.9	32	Not Detected	Not Detected
Toluene	6.9	26	Not Detected	Not Detected
trans-1,3-Dichloropropene	6.9	32	Not Detected	Not Detected
1,1,2-Trichloroethane	6.9	38	Not Detected	Not Detected
Tetrachloroethene	6.9	48	Not Detected	Not Detected
Ethylene Dibromide	6.9	54	Not Detected	Not Detected
Chlorobenzene	6.9	32	Not Detected	Not Detected
Ethyl Benzene	6.9	30	Not Detected	Not Detected
m,p-Xylene	6.9	30	Not Detected	Not Detected
o-Xylene	6.9	30	Not Detected	Not Detected
Styrene	6.9	30	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	6.9	48	Not Detected	Not Detected
1,3,5-Trimethylbenzene	6.9	34	Not Detected	Not Detected
1,2,4-Trimethylbenzene	6.9	34	Not Detected	Not Detected
1,3-Dichlorobenzene	6.9	42	Not Detected	Not Detected
1,4-Dichlorobenzene	6.9	42	Not Detected	Not Detected
Chlorotoluene	6.9	36	Not Detected	Not Detected
1,2-Dichlorobenzene	6.9	42	Not Detected	Not Detected
1,2,4-Trichlorobenzene	6.9	52	7.5	57
Hexachlorobutadiene	6.9	75	Not Detected	Not Detected
Propylene	28	48	Not Detected	Not Detected
1,3-Butadiene	28	62	Not Detected	Not Detected
Acetone	28	67	43	100
Carbon Disulfide	28	87	Not Detected	Not Detected
2-Propanol	28	69	Not Detected	Not Detected

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AIR TOXICS LTD.

SAMPLE NAME: I-1-2 SVE Test End Influent

ID#: 0010461-03A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110207	Date of Collection: 10/25/00
Dil. Factor:	13.8	Date of Analysis: 11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
trans-1,2-Dichloroethene	28	110	Not Detected	Not Detected
Vinyl Acetate	28	99	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	28	83	Not Detected	Not Detected
Hexane	28	99	Not Detected	Not Detected
Tetrahydrofuran	28	83	28	85
Cyclohexane	28	96	Not Detected	Not Detected
1,4-Dioxane	28	100	Not Detected	Not Detected
Bromodichloromethane	28	190	Not Detected	Not Detected
4-Methyl-2-pentanone	28	110	Not Detected	Not Detected
2-Hexanone	28	110	Not Detected	Not Detected
Dibromochloromethane	28	240	Not Detected	Not Detected
Bromoform	28	290	Not Detected	Not Detected
4-Ethyltoluene	28	140	Not Detected	Not Detected
Ethanol	28	53	Not Detected	Not Detected
Methyl tert-Butyl Ether	28	100	Not Detected	Not Detected
Heptane	28	110	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	94	70-130

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AIR TOXICS LTD.

SAMPLE NAME: I-1-2 SVE Test End Effluent

ID#: 0010461-04A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110214	**Date of Collection:**	10/25/00
Dil. Factor:	12.8	**Date of Analysis:**	11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	6.4	26	Not Detected	Not Detected
Trichloroethene	6.4	35	Not Detected	Not Detected
Tetrachloroethene	6.4	44	Not Detected	Not Detected
Freon 113	6.4	50	Not Detected	Not Detected
Chlorobenzene	6.4	30	Not Detected	Not Detected
Toluene	6.4	24	Not Detected	Not Detected
Acetone	26	62	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	26	77	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	110	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	91	70-130

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AIR TOXICS LTD.

SAMPLE NAME: I-1-2 SVE-C1 Inlet

ID#: 0010461-05A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110215	**Date of Collection:**	10/25/00
Dil. Factor:	12.8	**Date of Analysis:**	11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	6.4	26	12	48
Trichloroethene	6.4	35	260	1400
Tetrachloroethene	6.4	44	Not Detected	Not Detected
Freon 113	6.4	50	150	1200
Chlorobenzene	6.4	30	Not Detected	Not Detected
Toluene	6.4	24	Not Detected	Not Detected
Acetone	26	62	28	67
2-Butanone (Methyl Ethyl Ketone)	26	77	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	89	70-130

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AIR TOXICS LTD.

SAMPLE NAME: I-1-23-VS-VC-CI Inlet

ID#: 0010461-06A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110217	**Date of Collection:**	10/25/00
Dil. Factor:	202	**Date of Analysis:**	11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	100	410	770	3100
Trichloroethene	100	550	18000	99000
Tetrachloroethene	100	700	870	6000
Freon 113	100	790	Not Detected	Not Detected
Chlorobenzene	100	470	460	2200
Toluene	100	390	Not Detected	Not Detected
Acetone	400	980	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	400	1200	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	95	70-130

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AIR TOXICS LTD.

SAMPLE NAME: Method Spike

ID#: 0010461-07A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110203	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	%Recovery
Freon 12	0.50	2.5	100
Freon 114	0.50	3.6	99
Chloromethane	0.50	1.0	96
Vinyl Chloride	0.50	1.3	131 Q
Bromomethane	0.50	2.0	109
Chloroethane	0.50	1.3	85
Freon 11	0.50	2.8	99
1,1-Dichloroethene	0.50	2.0	100
Freon 113	0.50	3.9	95
Methylene Chloride	0.50	1.8	101
1,1-Dichloroethane	0.50	2.0	106
cis-1,2-Dichloroethene	0.50	2.0	107
Chloroform	0.50	2.5	107
1,1,1-Trichloroethane	0.50	2.8	100
Carbon Tetrachloride	0.50	3.2	95
Benzene	0.50	1.6	105
1,2-Dichloroethane	0.50	2.0	105
Trichloroethene	0.50	2.7	103
1,2-Dichloropropane	0.50	2.3	111
cis-1,3-Dichloropropene	0.50	2.3	106
Toluene	0.50	1.9	104
trans-1,3-Dichloropropene	0.50	2.3	107
1,1,2-Trichloroethane	0.50	2.8	104
Tetrachloroethene	0.50	3.4	104
Ethylene Dibromide	0.50	3.9	104
Chlorobenzene	0.50	2.3	104
Ethyl Benzene	0.50	2.2	101
m,p-Xylene	0.50	2.2	106
o-Xylene	0.50	2.2	103
Styrene	0.50	2.2	107
1,1,2,2-Tetrachloroethane	0.50	3.5	104
1,3,5-Trimethylbenzene	0.50	2.5	81
1,2,4-Trimethylbenzene	0.50	2.5	100
1,3-Dichlorobenzene	0.50	3.0	96
1,4-Dichlorobenzene	0.50	3.0	93
Chlorotoluene	0.50	2.6	106
1,2-Dichlorobenzene	0.50	3.0	93
1,2,4-Trichlorobenzene	0.50	3.8	69
Hexachlorobutadiene	0.50	5.4	64
Propylene	2.0	3.5	108
1,3-Butadiene	2.0	4.5	127
Acetone	2.0	4.8	109
Carbon Disulfide	2.0	6.3	103
2-Propanol	2.0	5.0	110

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AIR TOXICS LTD.

SAMPLE NAME: Method Spike

ID#: 0010461-07A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110203	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	%Recovery
trans-1,2-Dichloroethene	2.0	8.0	98
Vinyl Acetate	2.0	7.2	127
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	118
Hexane	2.0	7.2	103
Tetrahydrofuran	2.0	6.0	101
Cyclohexane	2.0	7.0	104
1,4-Dioxane	2.0	7.3	105
Bromodichloromethane	2.0	14	105
4-Methyl-2-pentanone	2.0	8.3	119
2-Hexanone	2.0	8.3	122
Dibromochloromethane	2.0	17	102
Bromoform	2.0	21	103
4-Ethyltoluene	2.0	10	106
Ethanol	2.0	3.8	106
Methyl tert-Butyl Ether	2.0	7.3	99
Heptane	2.0	8.3	114

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	99	70-130

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0010461-08A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110205	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	Not Detected	Not Detected
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	Not Detected	Not Detected
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	Not Detected	Not Detected
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	Not Detected	Not Detected
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
Benzene	0.50	1.6	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Ethyl Benzene	0.50	2.2	Not Detected	Not Detected
m,p-Xylene	0.50	2.2	Not Detected	Not Detected
o-Xylene	0.50	2.2	Not Detected	Not Detected
Styrene	0.50	2.2	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0010461-08A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q110205	**Date of Collection:**	NA
Dil. Factor:	1.00	**Date of Analysis:**	11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	Not Detected	Not Detected
Ethanol	2.0	3.8	Not Detected	Not Detected
Methyl tert-Butyl Ether	2.0	7.3	Not Detected	Not Detected
Heptane	2.0	8.3	Not Detected	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	110	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	92	70-130

10/26/00

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CHAIN-OF-CUSTODY RECORD

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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Jack Anderson
Company: RMT
Address: 744 Heartland Trail City: Madison State: WI Zip: 53717
Phone: 608-831-4444 FAX: 608-831-3334
Collected By: Signature: Dan Hook

Project info:
P.O. #:
Project #: 4781.06
Project Name: CONWR

Turn Around Time:
☒ Normal
☐ Rush _____ Specify

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
-01A	I-1-23 MPE Test End Effluent	10/25/00 15:00	Select VOCs: chlorobenzene, PCE, TCE, cis-1,2-DCE, ocetane, toluene, Freon 113, 2-butanone	26.0	16.0" Hg	16.5" Hg
-02A	I-1-23 MPE Test End Influent	10/25/00 15:00	VOCs/TO-14	26.5	7.0" Hg	7.5" Hg
-03A	I-1-2 SVE Test End Influent	10/25/00 17:10	VOCs/TO-14	26.0	12.0" Hg	12.5" Hg
-04A	I-1-2 SVE Test End Effluent	10/25/00 17:10	Select VOCs: see above	26.0	10.5" Hg	11.0" Hg
-05A	I-1-2 SVE-C1 INLET	10/25/00 10:45	Select VOCs: See above	29	11" Hg	11.0" Hg
-06A	I-1-23-US-UC-C1 INLET	10/25/00 10:10	Select VOCs: See above	29	15.5" Hg	15.0" Hg

Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
Dan Hook 10/25/00 7:00pm	Fed Ex
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
	J Wells - ATL 10-26-00 950
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	Fed Ex	4204708517	EJ	ambient	good	Yes No None	0010461

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0010435

Work Order Summary

CLIENT:	Mr. Jack Anderson RMT, Inc. 744 Heartland Trail Madison, WI 53717	**BILL TO:**	Mr. Jack Anderson RMT, Inc. 744 Heartland Trail Madison, WI 53717
PHONE:	608-831-4444	**P.O. #**	
FAX:	608-831-3334	**PROJECT #**	4781.06 CONWR
DATE RECEIVED:	10/25/00		
DATE COMPLETED:	11/7/00		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	I-1-23 MPE 48HRVC-VS Influent	TO-14	9.5 "Hg
02A	I-1-2SVE 1HR Influent	TO-14	16.5 "Hg
03A	Lab Blank	TO-14	NA
03B	Lab Blank	TO-14	NA

CERTIFIED BY: _____ Laboratory Director

DATE: 11/7/00

Certfication numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

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LABORATORY NARRATIVE
TO-14
RMT, Inc.
Workorder# 0010435

Two 1 Liter Summa Canister samples were received on October 25, 2000. The laboratory performed analysis via EPA Method TO-14 using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

During the five point calibration, two low-level standards are used. The low-level standard for TO-14 compounds is spiked at 0.5 ppbv and represents the reporting limit for these compounds. The low-level standard for the non-TO-14 compounds is spiked at 2.0 ppbv and represents the reporting limit for these compounds. The TO-14 compounds are present in both standards but are excluded from reporting in the 2.0 ppbv standard since a lower level is already included in the curve.

Method modifications taken to run these samples include:

Requirement	*TO-14*	*ATL Modifications*
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal standard recoveries.	Not specified.	Within 40% of the daily CCV internal standard area for blanks and samples.
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal calibration criteria.	Not specified.	RSD of 30% or less for standard compounds, 40% or less for non-standard and polar compounds
Continuing calibration verification criteria	Not specified.	70 - 130% for at least 90% of standard compounds, 60 - 140% for at least 80% of non-standard and polar compounds
Response factor for quantitation.	Average response factor (ICAL).	Average response factor (ICAL).

Receiving Notes

Sample I-1-2SVE 1HR Influent was received with significant vacuum remaining in the canister. The client was contacted and analysis proceeded. The residual canister vacuum resulted in elevated reporting limits.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit(background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

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S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the reporting limit.
N - The identification is based on presumptive evidence.

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AIR TOXICS LTD.

SAMPLE NAME: I-1-23 MPE 48HRVC-VS Influent

ID#: 0010435-01A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	c110311	**Date of Collection:**	10/24/00
Dil. Factor:	78.9	**Date of Analysis:**	11/3/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	39	160	540	2200
Trichloroethene	39	220	13000	72000
Tetrachloroethene	39	270	610	4200
Freon 113	39	310	Not Detected	Not Detected
Chlorobenzene	39	180	400	1900
Toluene	39	150	Not Detected	Not Detected
Acetone	160	380	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	160	470	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	94	70-130

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AIR TOXICS LTD.

SAMPLE NAME: I-1-2SVE 1HR Influent

ID#: 0010435-02A

EPA METHOD TO-14 GC/MS FULL SCAN

[illegible]	[illegible]	[illegible]	Date of Collection: 10/24/00	
[illegible]	[illegible]	[illegible]	Date of Analysis: 11/2/00	

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	9.0	36	Not Detected	Not Detected
Trichloroethene	9.0	49	160	890
Tetrachloroethene	9.0	62	Not Detected	Not Detected
Freon 113	9.0	70	110	880
Chlorobenzene	9.0	42	Not Detected	Not Detected
Toluene	9.0	34	Not Detected	Not Detected
Acetone	36	87	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	36	110	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	84	70-130

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AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0010435-03A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	011020[illegible]	Date of Collection: NA
Dil Factor:	1.00	Date of Analysis: 11/2/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	87	70-130

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AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0010435-03B

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	c110303	Date of Collection: NA
Dilution Factor:	1.00	Date of Analysis: 11/3/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	100	70-130

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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Jack Anderson
Company: RMT
Address: 744 Heartland Trail City: Madison State: WI Zip: 53717
Phone: 608-831-4444 FAX: 608-831-3334
Collected By: Signature: Daniel Hack

Project Info:
P.O. #:
Project #: 4781.06
Project Name: CONWR

Turn Around Time:
☒ Normal
☐ Rush _____ Specify

Lab I.D.	Field Sample I.D. 10/24/00	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
-01A	I-1-23 MDE 4HR Influent	10/24/00 7:45	Select VOCs: PCE, TCE, cis-1,2 DCE, 2-butanone, toluene, acetone, Freon 113, and chlorobenzene	26.5	10.0" Hg	9.5" Hg
	Blank					
-02A	I-1-23 VE 1HR Influent	10/24/00 9:40	Same	26.5	16.0" Hg	16.5" Hg

Relinquished By: (Signature) Date/Time: Daniel Hack 10/24/00 6:30pm FedEx
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: -ATL 10-25-00 911
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time:

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx	8242 0970 8528 ET		ambient	good	Yes No (None)	0010435

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0010369

Work Order Summary

CLIENT:	Mr. Jack Anderson RMT, Inc. 744 Heartland Trail Madison, WI 53717	***BILL TO:***	Mr. Mike DeBraske RMT, Inc. Renaissance Plaza 4351 W College Ave. Appleton, WI 54914
PHONE:	608-831-4444	**P.O. #**	
FAX:	608-831-3334	**PROJECT #**	4781.06 CONWR
DATE RECEIVED:	10/20/00		
DATE COMPLETED:	11/3/00		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	Repository US-UC1 10/18/00 14:10	TO-14	3.0 "Hg
02A	I-1-23 SVE 1 HR	TO-14	7.0 "Hg
03A	Repository US-UC1-UC2 10/19/00 13:15	TO-14	4.5 "Hg
04A	Lab Blank	TO-14	NA

CERTIFIED BY: _____ Laboratory Director

DATE: 11/3/00

Certfication numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
TO-14
RMT, Inc.
Workorder# 0010369

Three 1 Liter Summa Canister samples were received on October 20, 2000. The laboratory performed analysis via EPA Method TO-14 using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

During the five point calibration, two low-level standards are used. The low-level standard for TO-14 compounds is spiked at 0.5 ppbv and represents the reporting limit for these compounds. The low-level standard for the non-TO-14 compounds is spiked at 2.0 ppbv and represents the reporting limit for these compounds. The TO-14 compounds are present in both standards but are excluded from reporting in the 2.0 ppbv standard since a lower level is already included in the curve.

Method modifications taken to run these samples include:

Requirement	*TO-14*	*ATL Modifications*
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal standard recoveries.	Not specified.	Within 40% of the daily CCV internal standard area for blanks and samples.
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal calibration criteria.	Not specified.	RSD of 30% or less for standard compounds, 40% or less for non-standard and polar compounds
Continuing calibration verification criteria	Not specified.	70 - 130% for at least 90% of standard compounds, 60 - 140% for at least 80% of non-standard and polar compounds
Response factor for quantitation.	Average response factor (ICAL).	Average response factor (ICAL).

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit(background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

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U - Compound analyzed for but not detected above the reporting limit.
N - The identification is based on presumptive evidence.

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AIR TOXICS LTD.

SAMPLE NAME : Repository US-UC1 10/18/00 14:10

ID#: 0010369-01A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	I103007	**Date of Collection:**	**10/18/00**
Dil. Factor:	149	**Date of Analysis:**	**10/30/00**

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	74	300	480	1900
Trichloroethene	74	410	15000	84000
Tetrachloroethene	74	510	Not Detected	Not Detected
Freon 113	74	580	Not Detected	Not Detected
Chlorobenzene	74	350	Not Detected	Not Detected
Toluene	74	280	Not Detected	Not Detected
Acetone	300	720	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	300	890	700	2100

Container Type: 1 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	88	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	101	70-130

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AIR TOXICS LTD.

SAMPLE NAME : I-1-23 SVE 1 HR

ID#: 0010369-02A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	I103006	**Date of Collection:**	10/19/00
Dil. Factor:	17.6	**Date of Analysis:**	10/30/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	8.8	35	17	69
Trichloroethene	8.8	48	*2600*	*14000*
Tetrachloroethene	8.8	61	12	86
Freon 113	8.8	68	Not Detected	Not Detected
Chlorobenzene	8.8	41	Not Detected	Not Detected
Toluene	8.8	34	Not Detected	Not Detected
Acetone	35	85	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	35	100	130	380

Container Type: 1 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	88	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	98	70-130

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AIR TOXICS LTD.

SAMPLE NAME : Repository US-UC1-US2 10/19/00 13:15

ID#: 0010369-03A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	1103005	**Date of Collection:**	10/19/00
Dil. Factor:	190	**Date of Analysis:**	10/30/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	95	380	200	790
Trichloroethene	95	520	20000	110000
Tetrachloroethene	95	650	Not Detected	Not Detected
Freon 113	95	740	Not Detected	Not Detected
Chlorobenzene	95	440	Not Detected	Not Detected
Toluene	95	360	140	550
Acetone	380	920	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	380	1100	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	87	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	98	70-130

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AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 0010369-04A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	f103004	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/30/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected

Container Type: NA

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	88	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	99	70-130

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TM 10/24/00

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Jack Anderson
Company: RMT
Address: 744 Heartland Trail City: Madison State: WI Zip: 53717
Phone: 608-831-4444 FAX: 831-3334
Collected By: Signature: Daniel Hack

Project info:
P.O. #:
Project #: 4781.06
Project Name: CONWR

Turn Around Time:
☒ Normal
☐ Rush _____ Specify

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
-01A	Repository US-UC1 10/18/00 14:10	10/18/00 14:10	Selected VOCs: PCE TCE cis 1,2-DCE 2-butanone toluene acetone Freon 113 chlorobenzene per Ceres Barnunger	27.0	1.5" Hg	3.0" Hg
-02A	I-1-23 SVE 1 HR	10/19/00 11:34	same PID = 6.0	29.0	5" Hg	7.0" Hg
-03A	Repository US-UC1-UC2 10/19/00 13:15	10/19/00 13:15	Same	16.0	4.5" Hg	4.5" Hg

Relinquished By: (Signature) Date/Time: Daniel Hack 10/19/00 3:00 pm
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: E. Fields - ATL 10-20-00 900
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time:

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx	811991136845	E.J.	ambient	good	Yes No None	0010369

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0010416A

Work Order Summary

CLIENT:	Mr. Jack Anderson RMT, Inc. 744 Heartland Trail Madison, WI 53717	**BILL TO:**	Mr. Jack Anderson RMT, Inc. 744 Heartland Trail Madison, WI 53717
PHONE:	608-831-4444	**P.O. #**	
FAX:	608-831-3334	**PROJECT #**	4781.06 CONWR
DATE RECEIVED:	10/24/00		
DATE COMPLETED:	10/27/00		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	Repository UC1-US-UC2	TO-14	4.5 "Hg
02A	Lab Blank	TO-14	NA

CERTIFIED BY: _____ Laboratory Director

DATE: 10/27/00

Certfication numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

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LABORATORY NARRATIVE
TO-14
RMT, Inc.
Workorder# 0010416A

One 1 Liter Summa Canister sample was received on October 24, 2000. The laboratory performed analysis via EPA Method TO-14 using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

During the five point calibration, two low-level standards are used. The low-level standard for TO-14 compounds is spiked at 0.5 ppbv and represents the reporting limit for these compounds. The low-level standard for the non-TO-14 compounds is spiked at 2.0 ppbv and represents the reporting limit for these compounds. The TO-14 compounds are present in both standards but are excluded from reporting in the 2.0 ppbv standard since a lower level is already included in the curve.

Method modifications taken to run these samples include:

Requirement	*TO-14*	*ATL Modifications*
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal standard recoveries.	Not specified.	Within 40% of the daily CCV internal standard area for blanks and samples.
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal calibration criteria.	Not specified.	RSD of 30% or less for standard compounds, 40% or less for non-standard and polar compounds
Continuing calibration verification criteria	Not specified.	70 - 130% for at least 90% of standard compounds, 60 - 140% for at least 80% of non-standard and polar compounds
Response factor for quantitation.	Average response factor (ICAL).	Average response factor (ICAL).

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit(background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

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N - The identification is based on presumptive evidence.

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AIR TOXICS LTD.

SAMPLE NAME : Repository UC1-US-UC2

ID#: 0010416A-01A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	g102607	**Date of Collection:**	10/20/00
Dil. Factor:	238	**Date of Analysis:**	10/26/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	120	480	260	1000
Trichloroethene	120	650	23000	120000
Tetrachloroethene	120	820	Not Detected	Not Detected
Freon 113	120	930	Not Detected	Not Detected
Chlorobenzene	120	560	Not Detected	Not Detected
Toluene	120	460	220	830
Acetone	480	1100	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	480	1400	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	77	70-130

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AIR TOXICS LTD.

SAMPLE NAME : Lab Blank

ID#: 0010416A-02A

EPA METHOD TO-14 GC/MS Full Scan

File Name:	g102606	**Date of Collection:**	NA
Dil. Factor:	1.00	**Date of Analysis:**	10/26/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected

Container Type: NA

Surrogates	% Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	78	70-130

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10/24/00

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CHAIN-OF-CUSTODY RECORD

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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Jack Anderson
Company: RMT
Address: 744 Heartland Trail City: Madison State: WI Zip: 53717
Phone: 608-831-4444 FAX: 608-831-3334
Collected By: Signature: Don Hack

Project Info:
P.O. #:
Project #: 4781.06
Project Name: CONWR

Turn Around Time:
☒ Normal
☐ Rush _____ Specify

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
-01A	Repository, UC1-US-UC2 10/20/00 18:00	10/20/00 18:00	Select VOCs: PCE, TCE, cis-1,2 DCE, 2-butanone, toluene, acetone, Freon 113, and Chlorobenzene	28.5	5.0" Hg	4.5" Hg
	I-1-23 SVE Test End	10/21/00 7:50	same	26.5	2.5" Hg	
	Repository, UC1-US-UC2 Test End	10/21/00 8:15	VOCs/EPA TO-14	26.0	3.5" Hg	
	Repository Effluent Test End	10/21/00 8:25	select VOCs (see above list)	26.5	1.0" Hg	
	I-1-23 MPE UC HR1 Influent	10/22/00 9:50	VOCs/EPA TO-14	27.5	16.0" Hg	
	I-1-23 SVE HR1 Influent	10/22/00 16:22	Select VOCs (see above list)	27.0	10.5" Hg	
	I-1-2 SVE Effluent 1HR	10/22/00 16:25	VOCs/EPA TO-14	26.5	13.5" Hg	
	I-1-23 MPE UC Effluent 1HR	10/22/00 10:00	Select VOCs (see above list)	29.5	8.0" Hg	

Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
Don Hack 10/23/00 5:00pm	FedEx 10/23/00
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
	Aloha Smyr ATL 10/24/00 9:26
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FED EX	8118 9113 6856	AS	ambient	good	Yes No None	0010416A

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0010416B

Work Order Summary

CLIENT:	Mr. Jack Anderson RMT, Inc. 744 Heartland Trail Madison, WI 53717	**BILL TO:**	Mr. Jack Anderson RMT, Inc. 744 Heartland Trail Madison, WI 53717
PHONE:	608-831-4444	**P.O. #**	
FAX:	608-831-3334	**PROJECT #**	4781.06 CONWR
DATE RECEIVED:	10/24/00		
DATE COMPLETED:	11/7/00		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
02A	I-1-23 SVE Test End	TO-14	4.0 "Hg
03A	Repository VCI-VS-VC2 Test End	TO-14	4.0 "Hg
03AA	Repository VCI-VS-VC2 Test End Duplicate	TO-14	4.0 "Hg
04A	Repository Effluent Test End	TO-14	2.0 "Hg
05A	I-1-23 MPE VC HR1 Influent	TO-14	14.5 "Hg
06A	I-1-2 SVE HR1 Influent	TO-14	12.0 "Hg
07A	I-1-2 SVE Effluent 1HR	TO-14	14.5 "Hg
08A	I-1-23 MPE VC Effluent	TO-14	7.0 "Hg
09A	I-1-23 MPE 24HR VC-VS Influent	TO-14	8.5 "Hg
10A	Method Spike	TO-14	NA
11A	Lab Blank	TO-14	NA
11B	Lab Blank	TO-14	NA
11C	Lab Blank	TO-14	NA

CERTIFIED BY: _____ Laboratory Director

DATE: 11/8/00

Certfication numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
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LABORATORY NARRATIVE
TO-14
RMT, Inc.
Workorder# 0010416B

Eight 1 Liter Summa Canister samples were received on October 24, 2000. The laboratory performed analysis via EPA Method TO-14 using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

During the five point calibration, two low-level standards are used. The low-level standard for TO-14 compounds is spiked at 0.5 ppbv and represents the reporting limit for these compounds. The low-level standard for the non-TO-14 compounds is spiked at 2.0 ppbv and represents the reporting limit for these compounds. The TO-14 compounds are present in both standards but are excluded from reporting in the 2.0 ppbv standard since a lower level is already included in the curve.

Method modifications taken to run these samples include:

Requirement	*TO-14*	*ATL Modifications*
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal standard recoveries.	Not specified.	Within 40% of the daily CCV internal standard area for blanks and samples.
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal calibration criteria.	Not specified.	RSD of 30% or less for standard compounds, 40% or less for non-standard and polar compounds
Continuing calibration verification criteria	Not specified.	70 - 130% for at least 90% of standard compounds, 60 - 140% for at least 80% of non-standard and polar compounds
Response factor for quantitation.	Average response factor (ICAL).	Average response factor (ICAL).

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit(background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

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N - The identification is based on presumptive evidence.

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AIR TOXICS LTD.

SAMPLE NAME: I-1-23 SVE Test End

ID#: 0010416B-02A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	p110114	**Date of Collection:**	10/21/00
Dil. Factor:	5.5	**Date of Analysis:**	11/1/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	7.8	31	18	74
Trichloroethene	7.8	42	2100	12000
Tetrachloroethene	7.8	53	12	80
Freon 113	7.8	60	Not Detected	Not Detected
Chlorobenzene	7.8	36	Not Detected	Not Detected
Toluene	7.8	30	Not Detected	Not Detected
Acetone	31	75	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	31	93	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	83	70-130

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AIR TOXICS LTD.

SAMPLE NAME: Repository VCI-VS-VC2 Test End

ID#: 0010416B-03A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g110115	Date of Collection:	10/21/00
Dil. Factor:	233	Date of Analysis:	11/1/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	120	580	Not Detected	Not Detected
Freon 114	120	830	Not Detected	Not Detected
Chloromethane	120	240	Not Detected	Not Detected
Vinyl Chloride	120	300	Not Detected	Not Detected
Bromomethane	120	460	Not Detected	Not Detected
Chloroethane	120	310	Not Detected	Not Detected
Freon 11	120	660	Not Detected	Not Detected
1,1-Dichloroethene	120	470	Not Detected	Not Detected
Freon 113	120	910	Not Detected	Not Detected
Methylene Chloride	120	410	Not Detected	Not Detected
1,1-Dichloroethane	120	480	Not Detected	Not Detected
cis-1,2-Dichloroethene	120	470	240	980
Chloroform	120	580	Not Detected	Not Detected
1,1,1-Trichloroethane	120	650	Not Detected	Not Detected
Carbon Tetrachloride	120	740	Not Detected	Not Detected
Benzene	120	380	Not Detected	Not Detected
1,2-Dichloroethane	120	480	Not Detected	Not Detected
Trichloroethene	120	640	20000	110000
1,2-Dichloropropane	120	550	Not Detected	Not Detected
cis-1,3-Dichloropropene	120	540	Not Detected	Not Detected
Toluene	120	450	210	810
trans-1,3-Dichloropropene	120	540	Not Detected	Not Detected
1,1,2-Trichloroethane	120	650	Not Detected	Not Detected
Tetrachloroethene	120	800	Not Detected	Not Detected
Ethylene Dibromide	120	910	Not Detected	Not Detected
Chlorobenzene	120	540	Not Detected	Not Detected
Ethyl Benzene	120	510	Not Detected	Not Detected
m,p-Xylene	120	510	Not Detected	Not Detected
o-Xylene	120	510	Not Detected	Not Detected
Styrene	120	500	660	2800
1,1,2,2-Tetrachloroethane	120	810	Not Detected	Not Detected
1,3,5-Trimethylbenzene	120	580	Not Detected	Not Detected
1,2,4-Trimethylbenzene	120	580	Not Detected	Not Detected
1,3-Dichlorobenzene	120	710	Not Detected	Not Detected
1,4-Dichlorobenzene	120	710	Not Detected	Not Detected
Chlorotoluene	120	610	Not Detected	Not Detected
1,2-Dichlorobenzene	120	710	Not Detected	Not Detected
1,2,4-Trichlorobenzene	120	880	Not Detected	Not Detected
Hexachlorobutadiene	120	1300	Not Detected	Not Detected
Propylene	470	820	Not Detected	Not Detected
1,3-Butadiene	470	1000	Not Detected	Not Detected
Acetone	470	1100	Not Detected	Not Detected
Carbon Disulfide	470	1500	Not Detected	Not Detected
2-Propanol	470	1200	Not Detected	Not Detected

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AIR TOXICS LTD.

SAMPLE NAME: Repository VCI-VS-VC2 Test End

ID#: 0010416B-03A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g110115	**Date of Collection:**	10/21/00
Dil. Factor:	233	**Date of Analysis:**	11/1/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
trans-1,2-Dichloroethene	470	1900	Not Detected	Not Detected
Vinyl Acetate	470	1700	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	470	1400	Not Detected	Not Detected
Hexane	470	1700	Not Detected	Not Detected
Tetrahydrofuran	470	1400	Not Detected	Not Detected
Cyclohexane	470	1600	Not Detected	Not Detected
1,4-Dioxane	470	1700	Not Detected	Not Detected
Bromodichloromethane	470	3200	Not Detected	Not Detected
4-Methyl-2-pentanone	470	1900	Not Detected	Not Detected
2-Hexanone	470	1900	Not Detected	Not Detected
Dibromochloromethane	470	4000	Not Detected	Not Detected
Bromoform	470	4900	Not Detected	Not Detected
4-Ethyltoluene	470	2300	Not Detected	Not Detected
Ethanol	470	890	Not Detected	Not Detected
Methyl tert-Butyl Ether	470	1700	Not Detected	Not Detected
Heptane	470	1900	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	84	70-130

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AIR TOXICS LTD.

SAMPLE NAME: Repository VCI-VS-VC2 Test End Duplicate

ID#: 0010416B-03AA

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g110116	Date of Collection:	10/21/00
Dil. Factor:	233	Date of Analysis:	11/1/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	120	580	Not Detected	Not Detected
Freon 114	120	830	Not Detected	Not Detected
Chloromethane	120	240	Not Detected	Not Detected
Vinyl Chloride	120	300	Not Detected	Not Detected
Bromomethane	120	460	Not Detected	Not Detected
Chloroethane	120	310	Not Detected	Not Detected
Freon 11	120	660	Not Detected	Not Detected
1,1-Dichloroethene	120	470	Not Detected	Not Detected
Freon 113	120	910	Not Detected	Not Detected
Methylene Chloride	120	410	Not Detected	Not Detected
1,1-Dichloroethane	120	480	Not Detected	Not Detected
cis-1,2-Dichloroethene	120	470	230	950
Chloroform	120	580	Not Detected	Not Detected
1,1,1-Trichloroethane	120	650	Not Detected	Not Detected
Carbon Tetrachloride	120	740	Not Detected	Not Detected
Benzene	120	380	Not Detected	Not Detected
1,2-Dichloroethane	120	480	Not Detected	Not Detected
Trichloroethene	120	640	20000	110000
1,2-Dichloropropane	120	550	Not Detected	Not Detected
cis-1,3-Dichloropropene	120	540	Not Detected	Not Detected
Toluene	120	450	220	860
trans-1,3-Dichloropropene	120	540	Not Detected	Not Detected
1,1,2-Trichloroethane	120	650	Not Detected	Not Detected
Tetrachloroethene	120	800	Not Detected	Not Detected
Ethylene Dibromide	120	910	Not Detected	Not Detected
Chlorobenzene	120	540	Not Detected	Not Detected
Ethyl Benzene	120	510	Not Detected	Not Detected
m,p-Xylene	120	510	Not Detected	Not Detected
o-Xylene	120	510	Not Detected	Not Detected
Styrene	120	500	690	3000
1,1,2,2-Tetrachloroethane	120	810	Not Detected	Not Detected
1,3,5-Trimethylbenzene	120	580	Not Detected	Not Detected
1,2,4-Trimethylbenzene	120	580	Not Detected	Not Detected
1,3-Dichlorobenzene	120	710	Not Detected	Not Detected
1,4-Dichlorobenzene	120	710	Not Detected	Not Detected
Chlorotoluene	120	610	Not Detected	Not Detected
1,2-Dichlorobenzene	120	710	Not Detected	Not Detected
1,2,4-Trichlorobenzene	120	880	Not Detected	Not Detected
Hexachlorobutadiene	120	1300	Not Detected	Not Detected
Propylene	470	820	Not Detected	Not Detected
1,3-Butadiene	470	1000	Not Detected	Not Detected
Acetone	470	1100	Not Detected	Not Detected
Carbon Disulfide	470	1500	Not Detected	Not Detected
2-Propanol	470	1200	Not Detected	Not Detected

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AIR TOXICS LTD.

SAMPLE NAME: Repository VCI-VS-VC2 Test End Duplicate

ID#: 0010416B-03AA

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g110116	Date of Collection: 10/21/00
Dil. Factor:	233	Date of Analysis: 11/1/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
trans-1,2-Dichloroethene	470	1900	Not Detected	Not Detected
Vinyl Acetate	470	1700	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	470	1400	Not Detected	Not Detected
Hexane	470	1700	Not Detected	Not Detected
Tetrahydrofuran	470	1400	Not Detected	Not Detected
Cyclohexane	470	1600	Not Detected	Not Detected
1,4-Dioxane	470	1700	Not Detected	Not Detected
Bromodichloromethane	470	3200	Not Detected	Not Detected
4-Methyl-2-pentanone	470	1900	Not Detected	Not Detected
2-Hexanone	470	1900	Not Detected	Not Detected
Dibromochloromethane	470	4000	Not Detected	Not Detected
Bromoform	470	4900	Not Detected	Not Detected
4-Ethyltoluene	470	2300	Not Detected	Not Detected
Ethanol	470	890	Not Detected	Not Detected
Methyl tert-Butyl Ether	470	1700	Not Detected	Not Detected
Heptane	470	1900	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	87	70-130

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AIR TOXICS LTD.

SAMPLE NAME: Repository Effluent Test End

ID#: 0010416B-04A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g103120	Date of Collection: 10/21/00
Dil Factor:	8.64	Date of Analysis: 10/31/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	4.3	17	Not Detected	Not Detected
Trichloroethene	4.3	24	19	100
Tetrachloroethene	4.3	30	Not Detected	Not Detected
Freon 113	4.3	34	Not Detected	Not Detected
Chlorobenzene	4.3	20	Not Detected	Not Detected
Toluene	4.3	16	Not Detected	Not Detected
Acetone	17	42	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	17	52	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	86	70-130

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AIR TOXICS LTD.

SAMPLE NAME: I-1-23 MPE VC HR1 Influent

ID#: 0010416B-05A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	q103121	Date of Collection:	10/22/00
Dil. Factor:	31.3	Date of Analysis:	10/31/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	16	79	Not Detected	Not Detected
Freon 114	16	110	Not Detected	Not Detected
Chloromethane	16	33	Not Detected	Not Detected
Vinyl Chloride	16	41	Not Detected	Not Detected
Bromomethane	16	62	Not Detected	Not Detected
Chloroethane	16	42	Not Detected	Not Detected
Freon 11	16	89	Not Detected	Not Detected
1,1-Dichloroethene	16	63	Not Detected	Not Detected
Freon 113	16	120	Not Detected	Not Detected
Methylene Chloride	16	55	Not Detected	Not Detected
1,1-Dichloroethane	16	64	Not Detected	Not Detected
cis-1,2-Dichloroethene	16	63	110	440
Chloroform	16	78	Not Detected	Not Detected
1,1,1-Trichloroethane	16	87	Not Detected	Not Detected
Carbon Tetrachloride	16	100	Not Detected	Not Detected
Benzene	16	51	Not Detected	Not Detected
1,2-Dichloroethane	16	64	Not Detected	Not Detected
Trichloroethene	16	85	2900	16000
1,2-Dichloropropane	16	74	Not Detected	Not Detected
cis-1,3-Dichloropropene	16	72	Not Detected	Not Detected
Toluene	16	60	Not Detected	Not Detected
trans-1,3-Dichloropropene	16	72	Not Detected	Not Detected
1,1,2-Trichloroethane	16	87	Not Detected	Not Detected
Tetrachloroethene	16	110	39	270
Ethylene Dibromide	16	120	Not Detected	Not Detected
Chlorobenzene	16	73	Not Detected	Not Detected
Ethyl Benzene	16	69	Not Detected	Not Detected
m,p-Xylene	16	69	Not Detected	Not Detected
o-Xylene	16	69	Not Detected	Not Detected
Styrene	16	68	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	16	110	Not Detected	Not Detected
1,3,5-Trimethylbenzene	16	78	Not Detected	Not Detected
1,2,4-Trimethylbenzene	16	78	Not Detected	Not Detected
1,3-Dichlorobenzene	16	96	Not Detected	Not Detected
1,4-Dichlorobenzene	16	96	Not Detected	Not Detected
Chlorotoluene	16	82	Not Detected	Not Detected
1,2-Dichlorobenzene	16	96	Not Detected	Not Detected
1,2,4-Trichlorobenzene	16	120	91	680
Hexachlorobutadiene	16	170	Not Detected	Not Detected
Propylene	63	110	Not Detected	Not Detected
1,3-Butadiene	63	140	Not Detected	Not Detected
Acetone	63	150	Not Detected	Not Detected
Carbon Disulfide	63	200	Not Detected	Not Detected
2-Propanol	63	160	Not Detected	Not Detected

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AIR TOXICS LTD.

SAMPLE NAME: I-1-23 MPE VC HR1 Influent

ID#: 0010416B-05A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g103121	Date of Collection:	10/22/00
Dil. Factor:	31.3	Date of Analysis:	10/31/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
trans-1,2-Dichloroethene	63	250	Not Detected	Not Detected
Vinyl Acetate	63	220	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	63	190	490	1500
Hexane	63	220	Not Detected	Not Detected
Tetrahydrofuran	63	190	410	1200
Cyclohexane	63	220	Not Detected	Not Detected
1,4-Dioxane	63	230	Not Detected	Not Detected
Bromodichloromethane	63	430	Not Detected	Not Detected
4-Methyl-2-pentanone	63	260	Not Detected	Not Detected
2-Hexanone	63	260	Not Detected	Not Detected
Dibromochloromethane	63	540	Not Detected	Not Detected
Bromoform	63	660	Not Detected	Not Detected
4-Ethyltoluene	63	310	Not Detected	Not Detected
Ethanol	63	120	Not Detected	Not Detected
Methyl tert-Butyl Ether	63	230	Not Detected	Not Detected
Heptane	63	260	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	89	70-130

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AIR TOXICS LTD.

SAMPLE NAME: I-1-2 SVE HR1 Influent

ID#: 0010416B-06A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g103122	Date of Collection:	10/21/00
Dil Factor:	13.5	Date of Analysis:	11/1/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	6.8	27	Not Detected	Not Detected
Trichloroethene	6.8	37	110	590
Tetrachloroethene	6.8	46	Not Detected	Not Detected
Freon 113	6.8	52	73	560
Chlorobenzene	6.8	32	Not Detected	Not Detected
Toluene	6.8	26	Not Detected	Not Detected
Acetone	27	65	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	27	81	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	86	70-130

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AIR TOXICS LTD.

SAMPLE NAME: I-1-2 SVE Effluent 1HR

ID#: 0010416B-07A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g103123	Date of Collection: 10/21/00
Dil. Factor:	15.6	Date of Analysis: 11/1/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	7.8	39	Not Detected	Not Detected
Freon 114	7.8	55	Not Detected	Not Detected
Chloromethane	7.8	16	Not Detected	Not Detected
Vinyl Chloride	7.8	20	Not Detected	Not Detected
Bromomethane	7.8	31	Not Detected	Not Detected
Chloroethane	7.8	21	Not Detected	Not Detected
Freon 11	7.8	44	Not Detected	Not Detected
1,1-Dichloroethene	7.8	31	Not Detected	Not Detected
Freon 113	7.8	61	Not Detected	Not Detected
Methylene Chloride	7.8	28	Not Detected	Not Detected
1,1-Dichloroethane	7.8	32	Not Detected	Not Detected
cis-1,2-Dichloroethene	7.8	31	Not Detected	Not Detected
Chloroform	7.8	39	Not Detected	Not Detected
1,1,1-Trichloroethane	7.8	43	Not Detected	Not Detected
Carbon Tetrachloride	7.8	50	Not Detected	Not Detected
Benzene	7.8	25	Not Detected	Not Detected
1,2-Dichloroethane	7.8	32	Not Detected	Not Detected
Trichloroethene	7.8	43	Not Detected	Not Detected
1,2-Dichloropropane	7.8	37	Not Detected	Not Detected
cis-1,3-Dichloropropene	7.8	36	Not Detected	Not Detected
Toluene	7.8	30	Not Detected	Not Detected
trans-1,3-Dichloropropene	7.8	36	Not Detected	Not Detected
1,1,2-Trichloroethane	7.8	43	Not Detected	Not Detected
Tetrachloroethene	7.8	54	Not Detected	Not Detected
Ethylene Dibromide	7.8	61	Not Detected	Not Detected
Chlorobenzene	7.8	36	Not Detected	Not Detected
Ethyl Benzene	7.8	34	Not Detected	Not Detected
m,p-Xylene	7.8	34	Not Detected	Not Detected
o-Xylene	7.8	34	Not Detected	Not Detected
Styrene	7.8	34	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	7.8	54	Not Detected	Not Detected
1,3,5-Trimethylbenzene	7.8	39	Not Detected	Not Detected
1,2,4-Trimethylbenzene	7.8	39	Not Detected	Not Detected
1,3-Dichlorobenzene	7.8	48	Not Detected	Not Detected
1,4-Dichlorobenzene	7.8	48	Not Detected	Not Detected
Chlorotoluene	7.8	41	Not Detected	Not Detected
1,2-Dichlorobenzene	7.8	48	Not Detected	Not Detected
1,2,4-Trichlorobenzene	7.8	59	Not Detected	Not Detected
Hexachlorobutadiene	7.8	84	Not Detected	Not Detected
Propylene	31	54	Not Detected	Not Detected
1,3-Butadiene	31	70	Not Detected	Not Detected
Acetone	31	75	Not Detected	Not Detected
Carbon Disulfide	31	99	Not Detected	Not Detected
2-Propanol	31	78	Not Detected	Not Detected

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AIR TOXICS LTD.

SAMPLE NAME: I-1-2 SVE Effluent 1HR

ID#: 0010416B-07A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g103123	Date of Collection: 10/21/00
Dil. Factor:	15.6	Date of Analysis: 11/1/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
trans-1,2-Dichloroethene	31	120	Not Detected	Not Detected
Vinyl Acetate	31	110	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	31	94	Not Detected	Not Detected
Hexane	31	110	Not Detected	Not Detected
Tetrahydrofuran	31	94	Not Detected	Not Detected
Cyclohexane	31	110	Not Detected	Not Detected
1,4-Dioxane	31	110	Not Detected	Not Detected
Bromodichloromethane	31	210	Not Detected	Not Detected
4-Methyl-2-pentanone	31	130	Not Detected	Not Detected
2-Hexanone	31	130	Not Detected	Not Detected
Dibromochloromethane	31	270	Not Detected	Not Detected
Bromoform	31	330	Not Detected	Not Detected
4-Ethyltoluene	31	160	Not Detected	Not Detected
Ethanol	31	60	Not Detected	Not Detected
Methyl tert-Butyl Ether	31	110	Not Detected	Not Detected
Heptane	31	130	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	86	70-130

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AIR TOXICS LTD.

SAMPLE NAME: I-1-23 MPE VC Effluent

ID#: 0010416B-08A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g103124	Date of Collection:	10/22/00
Dil. Factor:	10.6	Date of Analysis:	11/1/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	5.3	21	Not Detected	Not Detected
Trichloroethene	5.3	29	Not Detected	Not Detected
Tetrachloroethene	5.3	36	Not Detected	Not Detected
Freon 113	5.3	41	Not Detected	Not Detected
Chlorobenzene	5.3	25	Not Detected	Not Detected
Toluene	5.3	20	Not Detected	Not Detected
Acetone	21	51	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	21	64	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	86	70-130

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AIR TOXICS LTD.

SAMPLE NAME: I-1-23 MPE 24HR VC-VS Influent

ID#: 0010416B-09A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	**I103113**	**Date of Collection:**	**10/23/00**
DIL Factor:	**113**	**Date of Analysis:**	**10/31/00**

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	56	230	470	1900
Trichloroethene	56	310	14000	78000
Tetrachloroethene	56	390	630	4300
Freon 113	56	440	Not Detected	Not Detected
Chlorobenzene	56	260	320	1500
Toluene	56	220	Not Detected	Not Detected
Acetone	230	540	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	230	680	Not Detected	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	99	70-130

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AIR TOXICS LTD.

SAMPLE NAME: Method Spike

ID#: 0010416B-10A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g110103	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/1/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	%Recovery
cis-1,2-Dichloroethene	0.50	2.0	103
Trichloroethene	0.50	2.7	98
Tetrachloroethene	0.50	3.4	101
Freon 113	0.50	3.9	110
Chlorobenzene	0.50	2.3	97
Toluene	0.50	1.9	105
Acetone	2.0	4.8	86
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	88

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	105	70-130

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AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0010416B-11A

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	1103105	Date of Collection: NA
DF: Factor:	1.00	Date of Analysis: 10/31/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	56	230	Not Detected	Not Detected
Trichloroethene	56	310	Not Detected	Not Detected
Tetrachloroethene	56	390	Not Detected	Not Detected
Freon 113	56	440	Not Detected	Not Detected
Chlorobenzene	56	260	Not Detected	Not Detected
Toluene	56	220	Not Detected	Not Detected
Acetone	230	540	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	230	680	Not Detected	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	91	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	103	70-130

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AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0010416B-11B

EPA METHOD TO-14 GC/MS FULL SCAN

File Name:	g103107	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/31/00

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	85	70-130

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AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0010416B-11C

EPA METHOD TO-14 GC/MS FULL SCAN

File Name: g110106	**Date of Collection: NA**
Dil. Factor: 1.00	**Date of Analysis: 11/1/00**

Compound	Det. Limit (ppbv)	Det. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Toluene	0.50	1.9	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	85	70-130

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TR 10/24/00

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CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice

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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Jack Anderson
Company: RMT
Address: 744 Heartland Trail City: Madison State: WI Zip: 53717
Phone: 608-831-4444 FAX: 608-831-3334
Collected By: Signature: Dan Hook

Project info:
P.O. #:
Project #: 4781.06
Project Name: CONWR

Turn Around Time:
☒ Normal
☐ Rush _____ Specify

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
	Repository, UC1-US-UC2 10/20/00 18:00	10/20/00 18:00	Select VOCs: PCE, TCE, cis-1,2 DCE, 2-butanone, toluene, acetone, Freon 113, and Chlorobenzene	28.5	5.0" Hg	
-02A	I-1-23 SVE Test End	10/21/00 7:50	same	26.5	2.5" Hg	4.0" Hg
-03A	Repository, UC1-US-UC2 Test End	10/21/00 8:15	VOCs/EPA TO-14	26.0	3.5" Hg	4.0" Hg
-04A	Repository Effluent Test End	10/21/00 8:25	select VOCs (see above list)	26.5	1.0" Hg	2.0" Hg
-05A	I-1-23 MPE UC HR1 Influent	10/22/00 9:50	VOCs/EPA TO-14	27.5	16.0" Hg	14.5" Hg
-06A	I-1-2 SVE HR1 Influent	10/21/00 16:22	Select VOCs (see above list)	27.0	10.5" Hg	12.0" Hg
-07A	I-1-2 SVE Effluent 1HR	10/21/00 16:25	VOCs/EPA TO-14	26.5	13.5" Hg	14.5" Hg
-08A	I-1-23 MPE UC Effluent 1HR	10/22/00 10:00	Select VOCs (see above list)	29.5	8.0" Hg	7.0" Hg

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Date/Time
Dan Hook	10/23/00 5:00pm	FedEx	10/23/00
		Aisha Bmp ATL	10/24/00 9:26

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FED EX	8118 9113 6856	AS	ambient	good	Yes No None	0010416

0010416

Form 29 rev 9

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CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice

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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Jack Anderson
Company: RMT
Address: 744 Heartland Trail City: Madison State: WI Zip: 53717
Phone: 608-831-4444 FAX: 608-831-3334
Collected By: Signature: Dan Hauk

Project info:
P.O. #:
Project #: 4781.06
Project Name: CONWR

Turn Around Time:
☒ Normal
☐ Rush _____ Specify

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
04	I-1-23 MPE 24HR UC-USTadjacent	10/23/00 7:00	Select VOCs: PCE, TCE, cis-1,2 DCE, 2-butanone, toluene, acetone, Freon 113, and chlorobenzene	29.0	9.0"Hg	8.5"Hg

Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
Dan Hauk 10/23/00 5:00pm	Fed Ex
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time: Tasha Smy ATL 10/24/00 9:26
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FEDEX	8118 9113 6856	AP	ambient	good	Yes No None	0010416

Form 1293 rev 09

Appendix P
Pilot Test Vacuum Influence and Drawdown Data

MPE Pilot Test Data - Vacuum Influence at Building I-1-23

DATE	TIME	WELLHEAD VACUUM (in. Hg)		VACUUM (in. W.C.)								
		MPE-UC	MPE-US	MP-1A	MP-1B	MP-1C	MP-2A	MP-2B	MP-2C	MP-3A	MP-3B	MP-3C
Distance from associated MPE well (feet)				6.55	4	3.8	9.2	7.1	7.4	8.8	14.35	14.6
Baseline												
10/22/2000	7:15	0	0	0	-0.015	0	0	0	0	0.005	0	0
10/22/2000	9:00	17.5	--	-0.025	-0.065	-0.01	-0.005	-0.03	0.01	0	-0.01	0
10/22/2000	9:45	16	--	0.02	-0.005	-0.01	0.005	-0.03	0.01	0	-0.01	-0.005
10/22/2000	10:50	17	--	-0.02	-0.01	-0.01	0	-0.005	-0.01	0	-0.01	-0.005
10/22/2000	11:35	17	--	-0.04	-0.03	-0.01	0	-0.03	-0.015	-0.02	-0.02	-0.005
10/22/2000	13:10	17.5	--	-0.15	-0.025	-0.015	-0.005	-0.025	-0.02	-0.01	-0.01	-0.005
10/22/2000	15:20	14	0	-0.02	0	-0.04	0	-0.05	-0.02	-0.01	-0.005	0
10/22/2000	17:38	12.3	0	0	0	0	0.01	0	0	-0.01	0	0
10/22/2000	18:55	11.7	0	0	0.03	0.04	0	0	0	0	0.005	0.01
10/22/2000	19:50	11.5	0	0.01	0	0.15	0	0	0	0.01	0.01	0
10/23/2000	7:15	10.7	0	-0.03	0	-0.01	0	0	0	0	0	-0.01
10/23/2000	9:00	11.5	0	-0.03	-0.02	-0.04	0	-0.01	-0.05	0.02	-0.01	0
10/23/2000	10:15	12	0	-0.04	-0.175	-0.2	0	-0.04	-0.04	0	-0.01	-0.01
10/23/2000	11:10	14	0	0	-0.015	0	-0.005	-0.11	0.02	0.005	-0.01	0
10/23/2000	13:10	18	0	-0.035	-0.15	-0.12	0	-0.01	-0.03	0	-0.015	-0.02
10/23/2000	14:50	15	0	0	-0.005	0	-0.01	-0.085	0	0	0.005	0.01
10/23/2000	16:30	14.5	0	0	-0.095	0.025	0.02	0	0	0.01	0.005	0.01
10/23/2000	18:00	13.5	0	0.02	0.01	0.03	0.005	0	0.045	0.03	0.005	0.005
10/23/2000	19:30	11.5	0	0	0	0.015	0	0	0.2	0.01	0	0.005
10/24/2000	7:15	10.5	0	-0.02	-0.015	-0.04	0	-0.01	-0.025	0	0	0
10/24/2000	9:00	12	0	-0.06	-0.025	-0.01	-0.01	-0.03	-0.03	0	-0.03	0.005
10/24/2000	10:25	13.5	0	0	-0.01	0	-0.005	0	0	-0.025	-0.04	0.005
10/24/2000	12:30	13.5	0	0	-0.015	-0.015	-0.005	-0.02	0	-0.03	-0.01	0
10/24/2000	14:00	15.5	0	0	-0.075	-0.02	0	-0.06	-0.055	0	-0.01	-0.005
10/24/2000	15:25	15.5	0	0	0	0	0	-0.05	0	0	0	0
10/24/2000	17:00	14.4	0	0	0	0	0	0	-0.025	0	0	0
10/24/2000	19:00	12.5	0	0	0.01	0.03	0	0	0	0	0	0
10/25/2000	7:30	16.5	0	-0.001	-0.005	-0.03	0	-0.02	-0.04	0	0	0
10/25/2000	11:10	19	0	0	-0.015	-0.01	-0.01	-0.01	-0.35	-0.01	-0.03	0
10/25/2000	13:10	19.5	--	-0.115	-0.03	-0.03	0	0	0.25	-0.04	0	-0.01
10/25/2000	14:00	19	--	--	--	--	0	0	0.25	-0.03	-0.005	-0.01

Notes:
US = Upper Sand.
UC = Upper Clay.
Positive pressure is denoted by negative values.
All monitoring point screens except MP-1B, MP-2A, MP-2B, and MP-3A were under water during the test.
MP-2A was dry throughout the entire test.

Prepared by: DJH
Checked by: BSS

2

MPE Pilot Test Data - Vacuum Influence at Area 9 Repository

DATE	TIME	WELLHEAD VACUUM (in. Hg)			VACUUM (in. W.C.)								
		MPE-US	MPE-UC1	MPE-UC2	MP-1A	MP-1B	MP-1C	MP-2A	MP-2B	MP-2C	MP-3A	MP-3B	MP-3C
Distance from associated MPE well (feet)					3.21	3.29	3.29	6.5	6.75	6.92	12.42	12.13	13.42
Baseline													
10/17/2000	11:15	0	0	0	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0	0.01
10/17/2000	15:00	--	--	--	0.01	0	0	--	--	--	0	0	--
10/17/2000	16:40	--	--	--	0.17	0.01	0	0	0.025	0	0	0.19	0
10/17/2000	18:15	16	--	--	0.49	0	0	0	0.01	0.01	0.02	0.1	0
10/17/2000	19:30	13	--	--	0.23	0.01	0	0.005	0	0	0	0	0
10/17/2000	20:45	11.5	--	--	--	0	0	0	0	0	0	0	0
10/17/2000	21:45	14	--	--	0.39	-0.005	-0.005	0.015	0	0	-0.005	0	0
10/18/2000	0:15	13.5	--	--	--	0	0	0	0.005	0	0	0	0
10/18/2000	1:27	13.7	--	--	-0.4	0	-0.02	0	-0.012	0.005	0.07	0	0
10/18/2000	3:40	13.7	--	--	-0.4	-0.005	-0.01	-0.009	-0.008	-0.08	-0.019	-0.85	-0.005
10/18/2000	5:00	14	--	--	-0.6	-0.005	-0.005	-0.21	-0.055	-0.01	-0.04	-0.17	-0.004
10/18/2000	6:00	14	--	--	-0.72	-0.005	-0.042	-0.2	0	0	-0.04	-0.01	0
10/18/2000	7:15	14	--	--	-0.8	-0.17	0	-0.025	-0.05	-0.005	-0.005	-0.32	0
10/18/2000	8:30	14	--	--	-0.8	-0.12	-0.062	-0.185	-0.02	-0.17	-0.5	-0.35	-0.005
10/18/2000	11:20	16	19	--	0.6	0.005	-0.005	0	0	0	0.01	0	-0.005
10/18/2000	13:05	16	17.5	--	0.8	0.11	0	0	0	0	0.02	0	-0.01
10/18/2000	14:10	16	17.5	--	0.6	0.02	0	0.005	0.005	0.005	0	0.02	-0.005
10/18/2000	15:20	16	18	--	-0.3	0	0	-0.03	-0.01	-0.005	-0.03	-0.16	-0.02
10/18/2000	16:10	16	18	--	-0.36	-0.015	-0.065	-0.14	-0.04	-0.04	-0.05	-0.005	-0.04
10/18/2000	17:00	16	18	--	-0.78	0.01	-0.035	-0.04	0.01	-0.01	-0.03	-0.03	0
10/18/2000	17:45	16	17	--	0.2	0.1	0.005	0	0	0.01	0.005	0	0
10/18/2000	19:00	15	15.5	--	0.8	0.01	0	0.005	-0.005	-0.005	0.04	0.04	-0.005
10/18/2000	20:40	12.5	15.5	--	-0.3	0.11	-0.005	0.005	0.005	0.01	-0.01	-0.005	-0.005
10/18/2000	22:30	12.5	15	10	-0.15	0.06	0.04	0	0.02	0.1	0.01	0.07	0
10/18/2000	23:25	12	14.5	8.5	0.36	0.01	0.025	-0.01	0	0.04	0.01	0.015	0
10/19/2000	0:30	--	--	--	-0.2	0.019	0.04	0	-0.005	0	-0.015	-0.01	0
10/19/2000	2:00	11.5	14.1	10.5	0	0	0.03	0	0	0	0	-0.01	0
10/19/2000	3:00	11.2	14.1	10.7	-0.21	0	0	0	0	0	0	-0.016	0
10/19/2000	3:45	11.2	14.1	10.7	-0.27	0	0	-0.01	0	0	0	0	0
10/19/2000	4:40	11.2	14	10.5	-0.43	0	0	0	0	0	0	0	0
10/19/2000	6:00	11.2	14	10.5	-0.15	0	0	0	0	0	-0.005	0	-0.005
10/19/2000	7:40	11.2	14.2	11.2	-0.11	-0.04	0	-0.05	0	-0.014	0	0	-0.02
10/19/2000	10:45	15	17.7	16.7	1.1	-0.02	-0.01	-0.04	-0.04	-0.03	-0.03	-0.03	-0.03
10/19/2000	13:15	16.5	18	16.5	-1.6	-0.12	0	-0.005	-0.02	0	0.01	0.01	-0.01
10/19/2000	16:30	16.5	19	17	-0.5	0.03	0.02	0.02	0	-0.07	0	-0.05	-0.25
10/19/2000	17:35	15.5	18	16.5	0.9	0.07	0.02	0.02	0	-0.04	0.005	-0.02	0
10/19/2000	20:40	12.5	15.5	12.5	0.6	0	0.005	-0.01	-0.02	-0.02	0	-0.01	-0.01
10/19/2000	21:25	12.5	15.5	12.5	0.3	0.01	0	0	0	-0.01	0	0	0

3

MPE Pilot Test Data - Vacuum Influence at Area 9 Repository (Continued)

DATE	TIME	WELLHEAD VACUUM (in. Hg)			VACUUM (in. W.C.)								
		MPE-US	MPE-UC1	MPE-UC2	MP-1A	MP-1B	MP-1C	MP-2A	MP-2B	MP-2C	MP-3A	MP-3B	MP-3C
10/20/2000	7:20	11.2	14.6	10.5	-0.7	-0.07	-0.01	-0.02	-0.01	0	-0.033	-0.015	-0.01
10/20/2000	8:30	12.5	16	12.5	-1.8	-0.06	-0.025	-0.025	-0.01	-0.12	-0.03	-0.3	-0.05
10/20/2000	10:10	14	18	15.5	-1.5	-0.02	0	-0.03	-0.01	-0.01	-0.01	0	-0.01
10/20/2000	12:50	17.1	19	16.7	-2	-0.1	0	-0.4	-0.01	-0.1	-0.01	-0.02	-0.01
10/20/2000	14:45	20.7	19.4	17.7	-0.3	-0.02	-0.04	0	0	0	0	0	0
10/20/2000	16:45	16.5	19.2	--	0	-0.01	0	0	0	0	0	0	0
10/20/2000	18:15	15.4	17.9	15.7	0	0	0	0	0	0	0	0	0
10/21/2000	7:30	12.6	15.6	12.5	0	-0.01	0	0	0	-0.03	0	-0.025	0

Notes:
US = Upper Sand.
UC1 and UC2 = Lower Clay.
Positive pressure is denoted by negative values.
All monitoring point screens were under water during the test.

Prepared by: DJH
Checked by: BSS

4

SVE Pilot Test Data - Vacuum Influence at Building I-1-23

DATE	TIME	WELLHEAD VACUUM (in. Hg)	VACUUM (in. W.C.) SVE WELLHEAD	MP-1A	MP-3A
Distance from SVE well (feet)			0	4	14.15
Baseline					
10/18/2000	11:53	0	0	-0.025	-0.025
10/18/2000	18:41	5	68	0	0
10/18/2000	20:10	15.5	211	0.1	
10/18/2000	20:40	15	204	0	0
10/18/2000	21:40	15	204	0.005	0
10/19/2000	13:40	21.5	292	0	-0.07
10/19/2000	14:10	21.5	292	-0.08	-0.055
10/19/2000	17:50	19	258	0.07	0.075
10/19/2000	20:40	14.5	197	0.07	0.033
10/19/2000	21:40	15	204	0.045	0
10/20/2000	7:45	16.5	224	0.18	0
10/20/2000	8:45	14.5	197	0	0
10/20/2000	9:45	19.2	261	0.067	0.005
10/20/2000	10:45	20.5	279	0.092	0.007
10/20/2000	11:30	20.8	283	0.05	0.007
10/20/2000	13:00	22	299	-0.01	0.02
10/20/2000	14:15	22.2	302	-0.005	0.02
10/20/2000	17:15	--	--	0.045	0.02
10/21/2000	7:45	15.5	211	0.2	0.03
10/21/2000	7:50	End of Test			

Notes:
Positive pressure is denoted by negative values.
All monitoring point screens were under water during the test.
MP-2A was dry and nonresponsive throughout the entire test. Therefore, data from MP-2A is considered suspect and was not recorded.

Prepared by: DJH
Checked by: BSS

SVE Pilot Test Data - Vacuum Influence at Building I-1-2

DATE	TIME	SVE WELLHEAD VACUUM (in. Hg)	VACUUM (in. W.C.)							
			MP-1	MP-2	MP-3	MWC-13	MWC-24	FD-1	FD-2	FD-3
Distance from SVE well			4.1	7	14.2	21.4	32	14.95	18.15	44.8
Baseline										
10/21/2000	13:28	0	-0.06	-0.025	-0.05	-0.085	-0.08	0	-0.005	--
10/21/2000	14:30	22	0.24	0.03	0.02	0	--	0.05	0.01	--
10/21/2000	15:00	20.8	0.32	0.015	0.025	-0.005	-0.055	0.06	0.01	--
10/21/2000	15:55	19	0.3	0.02	0.03	0.015	-0.16	0.08	0.03	--
10/21/2000	16:46	17.5	0.35	0.012	0.01	0.05	0.015	0.1	0.04	--
10/22/2000	6:30	System down because of the generator								
Baseline										
10/24/2000	8:00	0	-0.05	0.005	0	0	-0.04	0.01	0.01	0
10/24/2000	8:20	19	0	0	0	0	-0.045	0.115	0.025	0
10/24/2000	9:30	20.2	0.005	0	0.02	-0.015	-0.01	0.16	0.042	0.01
10/24/2000	10:50	21.8	0.15	0	0.05	0.03	-0.32	0.16	0.08	0
10/24/2000	12:36	21.8	-0.025	-0.24	-0.085	-0.225	-0.7	0.19	0.07	-0.07
10/24/2000	14:30	23.5	--	--	--	--	--	--	--	--
10/24/2000	14:41	System down on high temperature								
10/24/2000	15:10	23.8	0.1	0.01	0	0.065	-0.52	0.23	0.08	-0.01
10/24/2000	17:00	21	-0.005	-0.007	-0.005	0.015	0.01	0.22	0.08	-0.01
10/24/2000	20:00	18.5	-0.005	0	0.005	0.015	0.31	0.25	0.09	0
10/25/2000	8:30	16.5	-0.05	-0.025	-0.04	-0.14	-0.024	0.3	0.085	-0.015
10/25/2000	11:00	21.5	-0.005	0.005	-0.005	-0.08	-0.08	0.32	0.1	-0.07
10/25/2000	13:00	22.6	-0.01	0	-0.01	-0.015	-0.21	0.32	0.1	-0.025
10/25/2000	15:45	22	0.015	0.015	0	-0.04	0	0.31	0.08	-0.02
10/25/2000	17:00	20.5	0.03	0.015	0	--	--	0.31	-0.02	-0.26
10/25/2000	17:20	End of Test								

Notes:
Positive pressure is denoted by negative values.
MP-1 and MP-3 well screens were above water during the entire test.
MP-2 was dry throughout the entire test.
FD-1, -2, -3 = monitoring points installed by Fluor Daniel.

Prepared by: DJH
Checked by: BSS

6

MPE Pilot Test at Building I-1-23
Groundwater Flowrate and Drawdown Data

DATE/TIME	TOTAL FLOWRATE (gpm)[1]	DEPTH TO WATER (feet btc.)									DRAWDOWN (feet)[2]									DROP TUBE DEPTH (feet btc.)	
		MP-1A	MP-1B	MP-1C	MP-2A	MP-2B	MP-2C	MP-3A	MP-3B	MP-3C	MP-1A	MP-1B	MP-1C	MP-2A	MP-2B	MP-2C	MP-3A	MP-3B	MP-3C	MPE-UC	MPE-US
10/22/00 7:15	0	7.03	19.01	15.18	Dry	18.85	15.22	7.85	16.03	15.36	0	0	0	--	0	0	0	0	0		
10/22/00 9:00	0.22	7.09	19.03	15.27	Dry	18.85	15.28	7.89	16.04	15.45	-0.06	-0.02	-0.09	--	0	-0.06	-0.04	-0.01	-0.09	13.2	
10/22/00 9:45	0.22	7.03	19	15.27	Dry	18.82	15.32	7.88	16.04	15.43	0	0.01	-0.09	--	0.03	-0.1	-0.03	-0.01	-0.07	15	
10/22/00 10:50	0.23	7.08	19.01	15.33	Dry	18.82	15.35	7.9	16.05	15.46	-0.05	0	-0.15	--	0.03	-0.13	-0.05	-0.02	-0.1	17	
10/22/00 11:35	--	7.09	19.04	15.3	Dry	18.82	15.3	7.91	16.04	15.45	-0.06	-0.03	-0.12	--	0.03	-0.08	-0.06	-0.01	-0.09	19	
10/22/00 13:10	0.15	7.05	19	15.27	Dry	18.81	15.32	7.84	16.03	15.45	-0.02	0.01	-0.09	--	0.04	-0.1	0.01	0	-0.09	20.5	
10/22/00 15:20	6.3	7.05	18.99	16.86	Dry	18.8	16.54	7.86	16.01	17	-0.02	0.02	-1.68	--	0.05	-1.32	-0.01	0.02	-1.64	20.5	34.2
10/22/00 17:38	6.94	7.06	18.97	15.33	Dry	18.78	16.95	7.89	16.01	17.48	-0.03	0.04	-0.15	--	0.07	-1.73	-0.04	0.02	-2.12	20.5	35
10/22/00 18:55	6.88	7.08	18.98	17.53	Dry	18.79	17.13	7.97	16.04	17.62	-0.05	0.03	-2.35	--	0.06	-1.91	-0.12	-0.01	-2.26	20.5	36
10/22/00 19:50	--	7.38	19	17.66	Dry	18.82	17.27	7.98	17.65	17.72	-0.35	0.01	-2.48	--	0.03	-2.05	-0.13	-1.62	-2.36	20.5	37
10/23/00 7:15	6.88	7.11	18.94	18.11	Dry	18.78	17.64	8.01	16.21	18.16	-0.08	0.07	-2.93	--	0.07	-2.42	-0.16	-0.18	-2.8	20.5	37
10/23/00 9:00	7.1	7.11	18.93	18.21	Dry	18.77	17.74	8.04	16.23	18.26	-0.08	0.08	-3.03	--	0.08	-2.52	-0.19	-0.2	-2.9	20.5	38
10/23/00 10:15	7.1	7.11	18.93	18.27	Dry	18.78	17.66	8.05	16.26	18.33	-0.08	0.08	-3.09	--	0.07	-2.44	-0.2	-0.23	-2.97	20.5	39
10/23/00 11:10	6.9	7.1	18.88	18.27	Dry	18.77	17.81	7.98	16.28	18.33	-0.07	0.13	-3.09	--	0.08	-2.59	-0.13	-0.25	-2.97	20.5	40
10/23/00 13:10	4.6	7.09	18.95	17.52	Dry	18.72	17.29	8.07	16.28	17.61	-0.06	0.06	-2.34	--	0.13	-2.07	-0.22	-0.25	-2.25	20.5	41
10/23/00 14:50	7.3	7.06	18.96	18.29	Dry	18.78	17.84	8.07	16.28	18.36	-0.03	0.05	-3.11	--	0.07	-2.62	-0.22	-0.25	-3	20.5	40
10/23/00 16:30	7.2	7.09	18.95	18.36	Dry	18.77	17.91	8.09	16.31	18.43	-0.06	0.06	-3.18	--	0.08	-2.69	-0.24	-0.28	-3.07	20.5	40
10/23/00 18:00	7.2	7.11	18.95	18.39	Dry	18.78	17.96	8.03	16.32	18.49	-0.08	0.06	-3.21	--	0.07	-2.74	-0.18	-0.29	-3.13	20.5	40
10/23/00 19:30	7.58	7.12	18.95	18.44	Dry	18.78	17.99	8.11	16.35	18.53	-0.09	0.06	-3.26	--	0.07	-2.77	-0.26	-0.32	-3.17	20.5	40
10/24/00 7:15	--	7.13	18.94	18.62	Dry	18.76	18.16	8.18	16.52	18.68	-0.1	0.07	-3.44	--	0.09	-2.94	-0.33	-0.49	-3.32	20.5	40
10/24/00 9:00	7.7	7.14	18.94	18.64	Dry	18.77	18.23	8.18	16.55	18.74	-0.11	0.07	-3.46	--	0.08	-3.01	-0.33	-0.52	-3.38	20.5	40
10/24/00 10:25	7.6	7.14	18.91	18.65	Dry	18.78	18.21	8.18	16.57	18.73	-0.11	0.1	-3.47	--	0.07	-2.99	-0.33	-0.54	-3.37	20.5	40
10/24/00 12:30	7.35	7.12	18.91	18.75	Dry	18.77	18.23	8.12	16.58	18.72	-0.09	0.1	-3.57	--	0.08	-3.01	-0.27	-0.55	-3.36	20.5	40
10/24/00 14:00	7.56	7.11	18.94	18.7	Dry	18.77	18.23	8.2	16.61	18.72	-0.08	0.07	-3.52	--	0.08	-3.01	-0.35	-0.58	-3.36	20.5	40
10/24/00 15:25	7.7	7.12	18.94	18.75	Dry	18.76	18.28	8.22	16.61	18.83	-0.09	0.07	-3.57	--	0.09	-3.06	-0.37	-0.58	-3.47	20.5	41.5
10/24/00 17:00	7.98	7.1	18.9	18.78	Dry	18.76	18.31	8.21	16.62	18.85	-0.07	0.11	-3.6	--	0.09	-3.09	-0.36	-0.59	-3.49	20.5	42
10/24/00 19:00	7.56	7.13	18.94	18.82	Dry	18.77	18.37	8.2	16.65	18.88	-0.1	0.07	-3.64	--	0.08	-3.15	-0.35	-0.62	-3.52	20.5	42
10/25/00 7:30	8.02	7.15	18.93	18.96	Dry	18.77	18.43	8.3	16.8	19.02	-0.12	0.08	-3.78	--	0.08	-3.21	-0.45	-0.77	-3.66	20.5	42
10/25/00 11:10	8.7	7.14	18.9	18.98	Dry	18.76	18.54	8.31	16.84	19.03	-0.11	0.11	-3.8	--	0.09	-3.32	-0.46	-0.81	-3.67	20.5	42
10/25/00 13:10	7.9	7.12	18.92	19.01	Dry	18.76	18.48	8.33	16.84	19.06	-0.09	0.09	-3.83	--	0.09	-3.26	-0.48	-0.81	-3.7	20.5	43
10/25/00 14:00	8.3	7.12	18.93	19	Dry	18.76	18.47	8.36	16.85	19.07	-0.09	0.08	-3.82	--	0.09	-3.25	-0.51	-0.82	-3.71	20.5	43

Notes:

btc. = below top of casing.

US = Upper Sand.

UC = Upper Clay.

(1) Average groundwater flowrate from the Upper Clay was 0.21 gpm and 7.32 gpm from the Upper Clay and Upper Sand combined.

(2) Negative value indicates water level drop from initial depth prior to start of test. Positive value indicates water level rise.

Prepared by: DJH
Checked by: BSS

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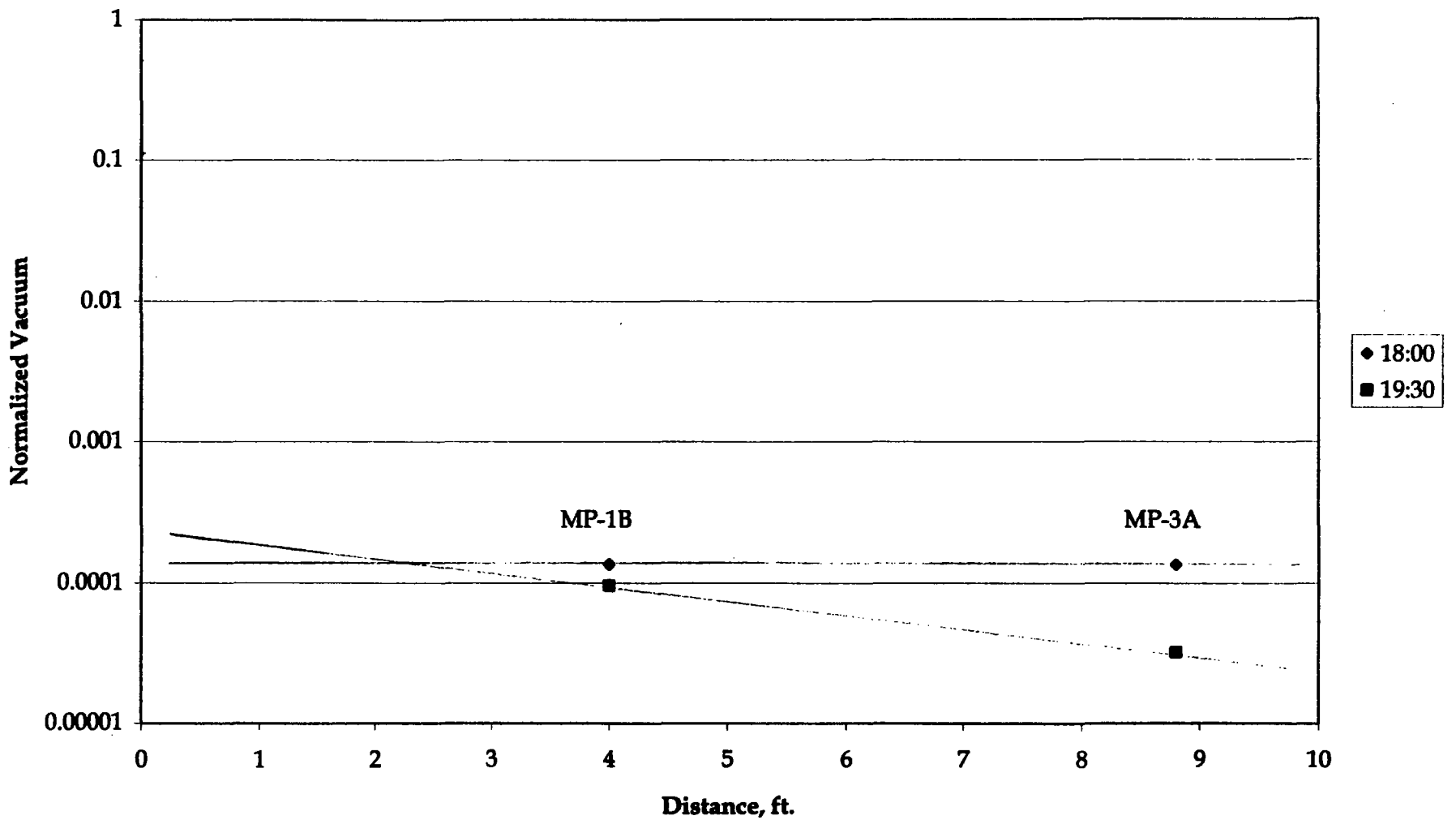
MPE Pilot Test at the Area 9 Repository
Groundwater Flowrate and Drawdown Data

	INFLUENT FLOW RATE	DEPTH TO WATER (feet btc.)									DRAWDOWN (feet)[2]									DROP TUBE DEPTH (feet btc.)		
DATE/TIME	(gpm)[1]	MP-1A	MP-1B	MP-1C	MP-2A	MP-2B	MP-2C	MP-3A	MP-3B	MP-3C	MP-1A	MP-1B	MP-1C	MP-2A	MP-2B	MP-2C	MP-3A	MP-3B	MP-3C	MPE-US	MPE-UC1	MPE-UC2
10/17/00 14:26	0	25.64	26.94	28.23	25.46	25.85	25.58	25.33	25.5	28.95	0	0	0	0	0	0	0	0	0			
10/17/00 16:40	0.41	29.7	26.77	27.65	26.24	26.58	25.73	26.47	27.02	28.36	-4.06	0.17	0.58	-0.78	-0.73	-0.15	-1.14	-1.52	0.59	28		
10/17/00 18:15	0.27	29.78	26.78	27.58	26.68	26.72	25.91	26.54	27.05	28.2	-4.14	0.16	0.65	-1.22	-0.87	-0.33	-1.21	-1.55	0.75	28		
10/17/00 19:30	0.4	29.48	26.87	27.52	26.77	26.75	26.03	26.55	27.13	28.11	-3.84	0.07	0.71	-1.31	-0.9	-0.45	-1.22	-1.63	0.84	30		
10/17/00 20:45	0.56	29.85	26.91	27.49	26.79	26.78	26.16	26.6	27.17	28	-4.21	0.03	0.74	-1.33	-0.93	-0.58	-1.27	-1.67	0.95	30		
10/17/00 21:45	0.23	29.92	26.97	27.47	26.85	26.8	26.26	26.66	27.24	27.94	-4.28	-0.03	0.76	-1.39	-0.95	-0.68	-1.33	-1.74	1.01	31.7		
10/17/00 22:50	--	29.94	27	27.45	26.89	26.82	26.33	26.66	27.3	27.89	-4.3	-0.06	0.78	-1.43	-0.97	-0.75	-1.33	-1.8	1.06	31.7		
10/18/00 0:15	--	30.09	27.15	27.39	26.91	26.86	26.42	26.7	27.26	27.78	-4.45	-0.21	0.84	-1.45	-1.01	-0.84	-1.37	-1.76	1.17	33		
10/18/00 1:27	--	30.09	27.15	27.37	26.95	26.86	26.49	26.74	27.24	27.68	-4.45	-0.21	0.86	-1.49	-1.01	-0.91	-1.41	-1.74	1.27	33		
10/18/00 3:40	0.38	29.98	27.18	27.33	26.98	26.9	26.57	26.77	27.3	27.57	-4.34	-0.24	0.9	-1.52	-1.05	-0.99	-1.44	-1.8	1.38	34.8		
10/18/00 5:00	0.35	30.06	27.22	27.31	27.05	26.93	26.67	26.74	27.36	27.53	-4.42	-0.28	0.92	-1.59	-1.08	-1.09	-1.41	-1.86	1.42	34.8		
10/18/00 6:00	--	30	27.25	27.4	27.1	26.93	26.71	26.72	27.3	27.45	-4.36	-0.31	0.83	-1.64	-1.08	-1.13	-1.39	-1.8	1.5	34.8		
10/18/00 7:15	--	29.94	27.27	27.33	--	--	--	26.71	27.35	27.4	-4.3	-0.33	0.9	--	--	--	-1.38	-1.85	1.55	34.8		
10/18/00 8:30	--	29.78	27.33	27.34	27.13	27.04	26.78	26.72	27.3	27.31	-4.14	-0.39	0.89	-1.67	-1.19	-1.2	-1.39	-1.8	1.64	34.8		
10/18/00 11:20	0.28	30.27	27.57	27.31	27.19	27.19	26.82	26.8	27.45	27.22	-4.63	-0.63	0.92	-1.73	-1.34	-1.24	-1.47	-1.95	1.73	34.8	35.5	
10/18/00 13:05	--	30.32	27.8	27.3	27.16	27.27	27	26.81	27.4	27.17	-4.68	-0.86	0.93	-1.7	-1.42	-1.42	-1.48	-1.9	1.78	34.8	36.5	
10/18/00 14:10	0.36	30.21	28.05	27.35	27.18	27.31	27.16	26.81	27.39	27.15	-4.57	-1.11	0.88	-1.72	-1.46	-1.58	-1.48	-1.89	1.8	34.8	37	
10/18/00 15:20	0.37	30.09	28.15	27.37	27.15	27.3	27.25	26.76	27.35	27.14	-4.45	-1.21	0.86	-1.69	-1.45	-1.67	-1.43	-1.85	1.81	34.8	38	
10/18/00 16:10	0.36	29.99	28.24	27.38	27.14	27.31	27.32	26.76	27.33	27.13	-4.35	-1.3	0.85	-1.68	-1.46	-1.74	-1.43	-1.83	1.82	34.8	39	
10/18/00 17:00	0.34	29.72	28.36	27.4	27.13	27.31	27.4	26.73	27.3	27.11	-4.08	-1.42	0.83	-1.67	-1.46	-1.82	-1.4	-1.8	1.84	34.8	40	
10/18/00 17:45	0.34	29.79	28.46	27.43	27.13	27.32	27.47	26.72	27.28	27.09	-4.15	-1.52	0.8	-1.67	-1.47	-1.89	-1.39	-1.78	1.86	34.8	41	
10/18/00 19:00	0.29	30.09	28.56	27.46	27.15	27.33	27.55	26.77	27.34	27.14	-4.45	-1.62	0.77	-1.69	-1.48	-1.97	-1.44	-1.84	1.81	34.8	42	
10/18/00 20:40	0.34	30.47	28.73	27.51	27.22	27.38	27.65	26.85	27.45	27.05	-4.83	-1.79	0.72	-1.76	-1.53	-2.07	-1.52	-1.95	1.9	34.8	43	
10/18/00 22:30	0.4	30.22	28.91	27.88	27.27	27.48	27.62	26.85	27.52	27.17	-4.58	-1.97	0.35	-1.81	-1.63	-2.04	-1.52	-2.02	1.78	34.8	43	44.2
10/18/00 23:25	0.47	30.21	29.02	28.14	27.32	27.57	29.95	26.97	27.55	27.4	-4.57	-2.08	0.09	-1.86	-1.72	-4.37	-1.64	-2.05	1.55	34.8	43	46
10/19/00 0:30	--	29.7	29.16	28.72	27.28	27.55	31.42	26.91	27.47	27.8	-4.06	-2.22	-0.49	-1.82	-1.7	-5.84	-1.58	-1.97	1.15	34.8	43	48.1
10/19/00 2:00	--	29.72	29.27	29.22	27.27	27.55	32.21	26.88	27.45	28.1	-4.08	-2.33	-0.99	-1.81	-1.7	-6.63	-1.55	-1.95	0.85	34.8	43	48.1
10/19/00 3:00	--	29.69	29.35	29.51	27.25	27.54	32.65	26.88	27.46	28.34	-4.05	-2.41	-1.28	-1.79	-1.69	-7.07	-1.55	-1.96	0.61	34.8	43	48.1
10/19/00 3:45	0.35	29.75	29.4	29.74	27.29	27.53	32.9	26.85	27.43	28.46	-4.11	-2.46	-1.51	-1.83	-1.68	-7.32	-1.52	-1.93	0.49	34.8	43	48.1
10/19/00 4:40	0.34	29.57	29.59	30.06	27.27	27.52	33.18	26.88	27.43	28.63	-3.93	-2.65	-1.83	-1.81	-1.67	-7.6	-1.55	-1.93	0.32	34.8	43	48.1
10/19/00 6:00	0.38	29.58	29.62	30.36	27.23	27.47	33.38	26.81	27.37	28.8	-3.94	-2.68	-2.13	-1.77	-1.62	-7.8	-1.48	-1.87	0.15	34.8	43	48.1
10/19/00 7:40	0.39	30.48	29.75	30.82	27.35	27.54	33.56	26.96	27.56	29.03	-4.84	-2.81	-2.59	-1.89	-1.69	-7.98	-1.63	-2.06	-0.08	34.8	43	48.1
10/19/00 10:45	--	30.48	29.85	31.42	27.46	27.64	33.65	27.04	27.63	29.25	-4.84	-2.91	-3.19	-2	-1.79	-8.07	-1.71	-2.13	-0.3	34.8	43	48.1
10/19/00 13:15	0.28	30.56	29.92	31.81	27.35	27.56	33.55	26.94	27.58	29.39	-4.92	-2.98	-3.58	-1.89	-1.71	-7.97	-1.61	-2.08	-0.44	34.8	43	51.7
10/19/00 16:30	0.42	30.33	29.98	32.15	27.26	27.47	33.36	26.88	27.49	29.47	-4.69	-3.04	-3.92	-1.8	-1.62	-7.78	-1.55	-1.99	-0.52	34.8	43	51.7
10/19/00 17:35	0.3	30.26	29.99	32.27	27.3	27.49	33.33	26.89	27.47	29.53	-4.62	-3.05	-4.04	-1.84	-1.64	-7.75	-1.56	-1.97	-0.58	34.8	43	51.7
10/19/00 20:40	0.29	30.33	30	32.53	27.25	27.43	33.17	26.87	27.45	29.55	-4.69	-3.06	-4.3	-1.79	-1.58	-7.59	-1.54	-1.95	-0.6	34.8	43	51.7
10/19/00 21:25	0.31	30.54	30	32.59	27.27	27.42	33.14	26.88	27.45	29.57	-4.9	-3.06	-4.36	-1.81	-1.57	-7.56	-1.55	-1.95	-0.62	34.8	43	51.7
10/20/00 7:20	0.24	30.42	29.94	33.13	27.2	27.35	32.82	26.85	27.44	29.51	-4.78	-3	-4.9	-1.74	-1.5	-7.24	-1.52	-1.94	-0.56	34.8	43	51.7
10/20/00 8:30	0.32	30.17	29.93	33.2	27.2	27.37	32.76	26.78	27.34	29.54	-4.53	-2.99	-4.97	-1.74	-1.52	-7.18	-1.45	-1.84	-0.59	34.8	43	51.7
10/20/00 10:10	0.26	29.87	29.9	33.22	27.13	27.26	32.68	26.74	27.28	29.52	-4.23	-2.96	-4.99	-1.67	-1.41	-7.1	-1.41	-1.78	-0.57	34.8	43	51.7
10/20/00 12:50	0.28	29.42	29.85	33.27	27.05	27.16	32.54	26.64	27.15	29.49	-3.78	-2.91	-5.04	-1.59	-1.31	-6.96	-1.31	-1.65	-0.54	34.8	43	51.7
10/20/00 14:45	0.277	29.35	29.82	33.3	26.98	27.11	32.35	26.58	27.1	29.44	-3.71	-2.88	-5.07	-1.52	-1.26	-6.77	-1.25	-1.6	-0.49	34.8	43	51.7
10/20/00 16:45	0.267	29.28	29.78	33.31	26.95	27.1	32.23	26.55	27.06	29.41	-3.64	-2.84	-5.08	-1.49	-1.25	-6.65	-1.22	-1.56	-0.46	34.8	43	51.7
10/20/00 18:15	0.283	29.25	29.79	33.3	26.93	27.07	32.18	26.56	27.03	29.4	-3.61	-2.85	-5.07	-1.47	-1.22	-6.6	-1.23	-1.53	-0.45	34.8	43	51.7
10/21/00 7:30	0.274	29.6	29.76	33.33	27.26	27.31	32.05	26.79	27.36	29.18	-3.96	-2.82	-5.1	-1.8	-1.46	-6.47	-1.46	-1.86	-0.23	34.8	43	51.7

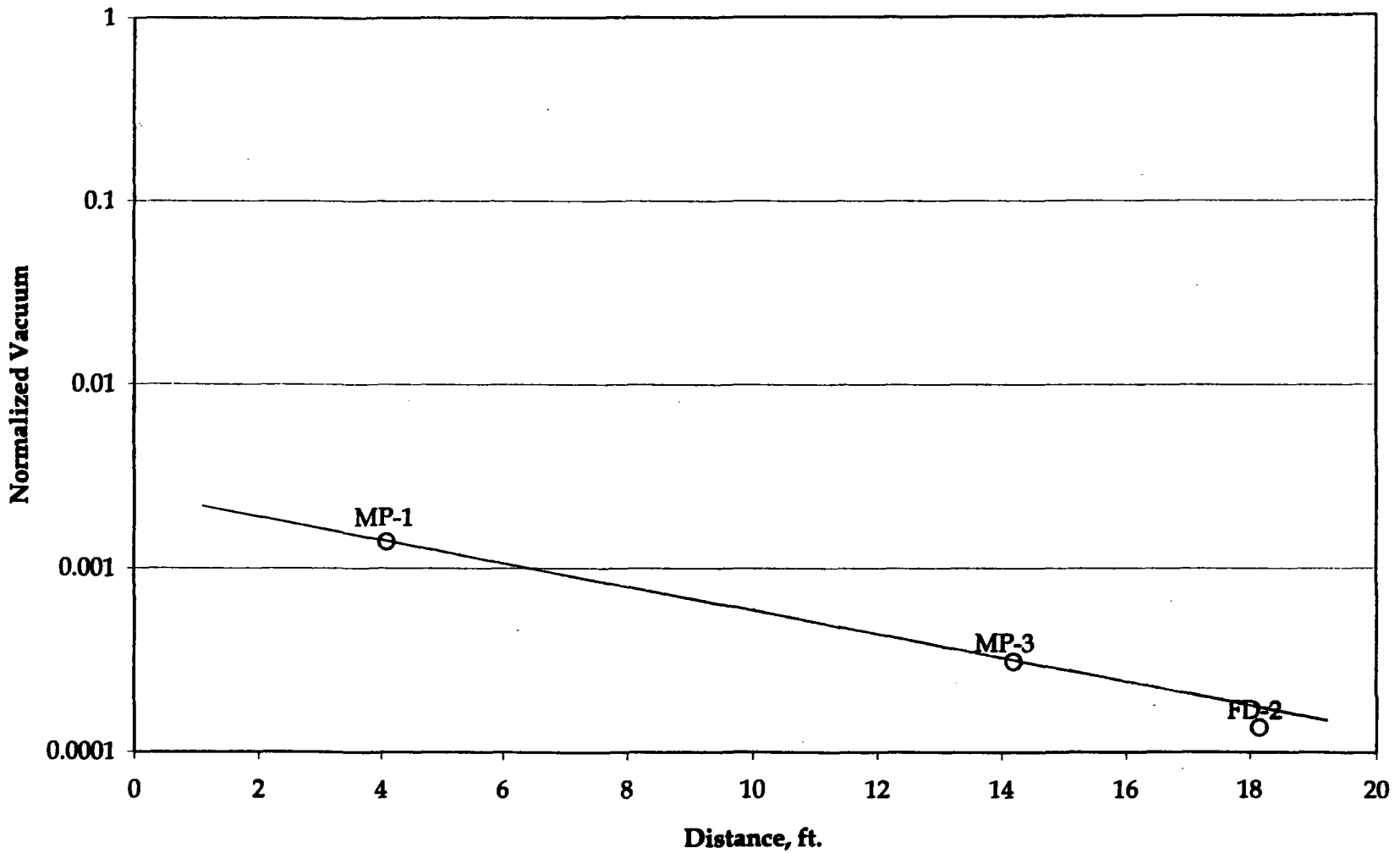
Notes:
btc. = below top of casing.
US = Upper Sand.
UC1 and UC2 = Lower Clay.
(1) Average groundwater flow rate from the Upper Sand was 0.37 gpm and 0.33 gpm from the Upper Sand and Lower Clay combined.
(2) Negative value indicates water level drop from initial depth prior to start of test. Positive value indicates water level rise.

Prepared by: DJH
Checked by: BSS

Normalized Vacuum vs. Distance for MPE-UC at Building I-1-23
Crab Orchard NWR



Normalized Vacuum vs. Distance for SVE at Building I-1-2 (10/21/00)
Crab Orchard NWR



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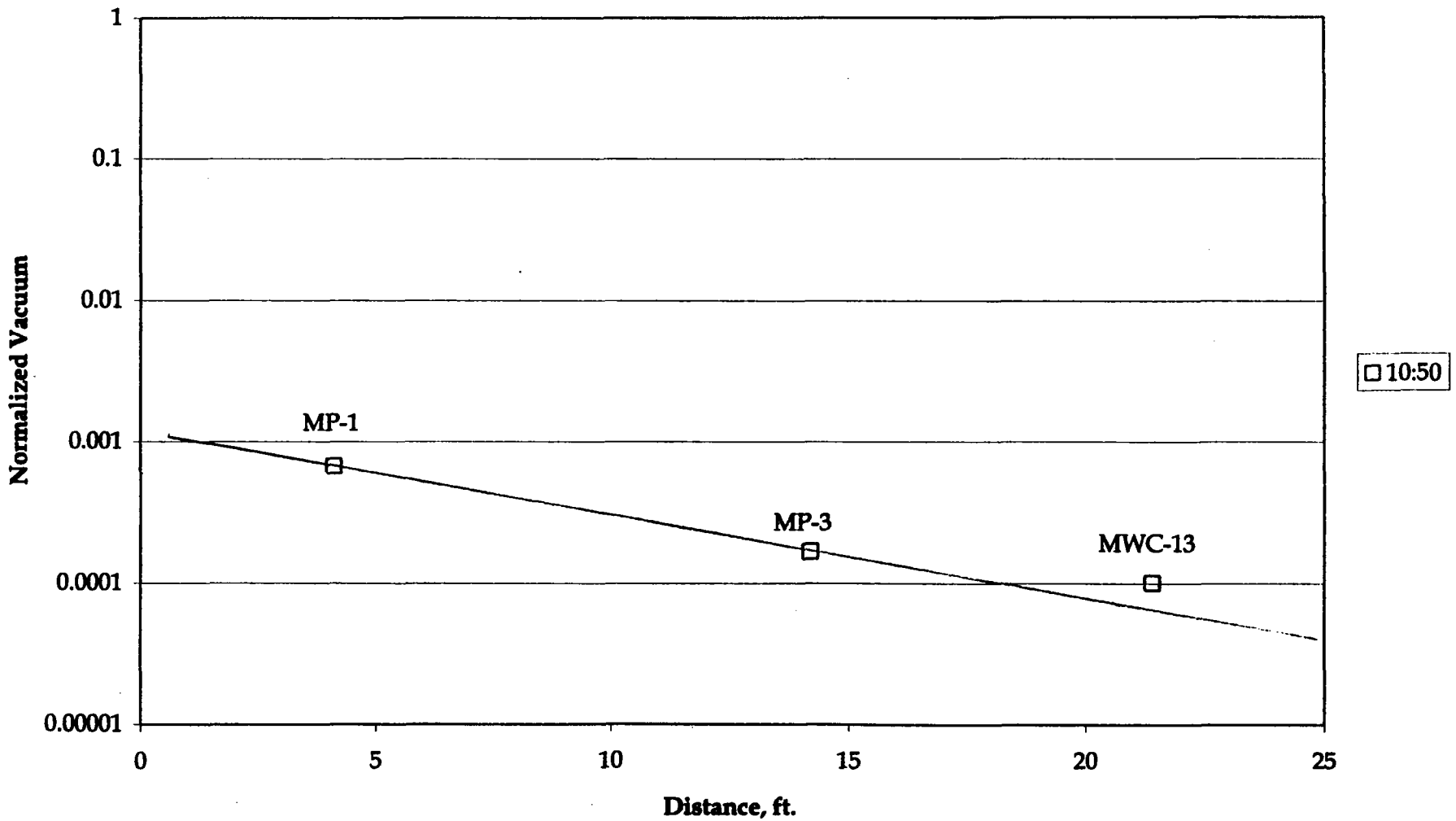
Normalized Vacuum vs. Distance for SVE at Building I-1-2 (10/24-10/25/00)
Crab Orchard NWR



11/11

Appendix Q
Soil Physical Parameter Analysis Reports

Crab Orchard NWR
Capillary Moisture Retention
Test
ASTM D 3152

Pressure (Bar)	0	0.3	0.7	2	5	15	1	% Saturated	Average
Sample	**Vol. Moisture Content %**							@ 1 atm	
1-1-23 SVE @ 5.25-7.25'	46.95	41.20	38.85	35.02	32.04	24.30	37.5	79.9%	81.5%
1-1-23 SVE @ 5.25-7.25R'	46.90	42.54	40.21	35.83	32.34	23.88	39.0	83.2%	
1-1-2 SVE @ 6.0-8.0'	38.47	33.64	32.18	29.00	25.35	20.86	31.0	80.6%	84.3%
1-1-2 SVE @ 6.0-8.0R'	35.76	33.86	32.48	29.72	26.82	22.57	31.5	88.1%	
1-1-23 UC @ 14.0-16.0'	39.54	37.17	35.79	30.20	25.64	18.74	34.0	86.0%	80.1%
1-1-23 UC @ 14.0-16.0R'	48.55	39.20	37.16	33.91	31.29	24.26	36.0	74.2%	
MPE-UC2 @ 45.0-47.5'	35.83	34.29	33.69	31.66	29.27	20.04	33.0	92.1%	90.0%
MPE-UC2 @ 45.0-47.5R'	38.11	34.90	33.99	31.78	29.40	19.80	33.5	87.9%	
MPE-UC1 @ 39.0-40.5'	46.98	41.55	40.10	37.39	34.31	19.17	39.5	84.1%	87.1%
MPE-UC1 @ 39.0-40.5R'	44.39	41.96	40.77	37.97	34.94	24.20	40.0	90.1%	
1-1-23 US @ 32.0-34.5'	32.41	14.95	11.19	7.69	5.67	3.39	10.0	30.9%	31.2%
1-1-23 US @ 32.0-34.5R'	33.29	13.35	11.58	7.42	5.76	3.29	10.5	31.5%	
MPE-US @ 30.5-32.5'	32.66	26.35	21.83	15.66	12.99	8.86	20.0	61.2%	53.9%
MPE-US @ 30.5-32.5R'	38.62	21.69	20.94	11.91	10.70	6.34	18.0	46.6%	

* Values for Vol. MC% @ 1 bar were determined from plots

Example Calculation: Sample MPE-US @ 30.5-32.5'

Vol. Moisture Content at 0 atm (at saturation) = 32.66%
Vol. Moisture Content at 1 atm = 20%

% saturated at 1 atm = (20/32.66)*100 = 61.2% saturation

ADVANCED TERRA TESTING, Inc.
ATT
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

HYDROMETER ANALYSIS

With Mechanical Grain Size Analysis

ASTM D 422

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT RMT, Inc.

JOB NO. 2473-01

BORING NO.	Repository	SAMPLED	9/28/00
DEPTH	30.5' - 32.5'	DATE TESTED	11/30/00 MC
SAMPLE NO.	MPE-US	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	69.46
Wt. Dry Soil & Pan (g)	68.96
Wt. Lost Moisture (g)	0.50
Wt. of Pan Only (g)	3.74
Wt. of Dry Soil (g)	65.22
Moisture Content %	0.8
Wt. Hydrom. Sample Wet (g)	55.68
Wt. Hydrom. Sample Dry (g)	55.26

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	384.62
Weight of + #10 Before Washing (g)	0.14
Weight of + #10 After Washing (g)	0.09
Weight of - #10 Wet (g)	384.48
Weight of - #10 Dry (g)	381.60
Wt. Total Sample Dry (g)	381.69
Calc. Wt. "W" (g)	55.27
Calc. Mass + #10	0.01

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.09	0.09	0.09	0.0	100.0
#20	2.39	2.45	0.06	0.06	0.1	99.9
#40	2.36	2.58	0.22	0.28	0.5	99.5
#60	2.37	3.48	1.11	1.39	2.5	97.5
#100	2.36	19.19	16.83	18.22	33.0	67.0
#200	2.35	21.43	19.08	37.30	67.5	32.5

Data entered by: MC Date: 12/04/2000
Data checked by: KR Date: 12/10/2000
FileName: RCH0US30

ADVANCED TERRA TESTING, INC. 9

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.	Repository	SAMPLED	9/28/00
DEPTH	30.5' - 32.5'	DATE TESTED	11/30/00 MC
SAMPLE NO.	MPE-US	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.5
Sp. Gr. of Soil	2.68	Temp. Coef. K	0.01297
Value of "alpha"	0.99	Wt. Dry Sample "W"	55.273
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.5		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	20.50	15.00	27.0	27.0	12.93	0.0660
1.0	17.50	12.00	21.6	21.6	13.42	0.0475
2.0	16.50	11.00	19.8	19.8	13.58	0.0338
5.0	15.25	9.75	17.5	17.5	13.79	0.0215
15.0	14.00	8.50	15.3	15.3	13.99	0.0125
30.0	13.00	7.50	13.5	13.5	14.16	0.0089
60.0	13.00	7.50	13.5	13.5	14.16	0.0063
120.0	12.25	6.75	12.1	12.1	14.28	0.0045
250.0	11.75	6.25	11.2	11.2	14.36	0.0031
1440.0	11.00	5.50	9.9	9.9	14.49	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/04/2000
Data checked by:_____ Date:_____
FileName: RCH0US30

ADVANCED TERRA TESTING, INC.

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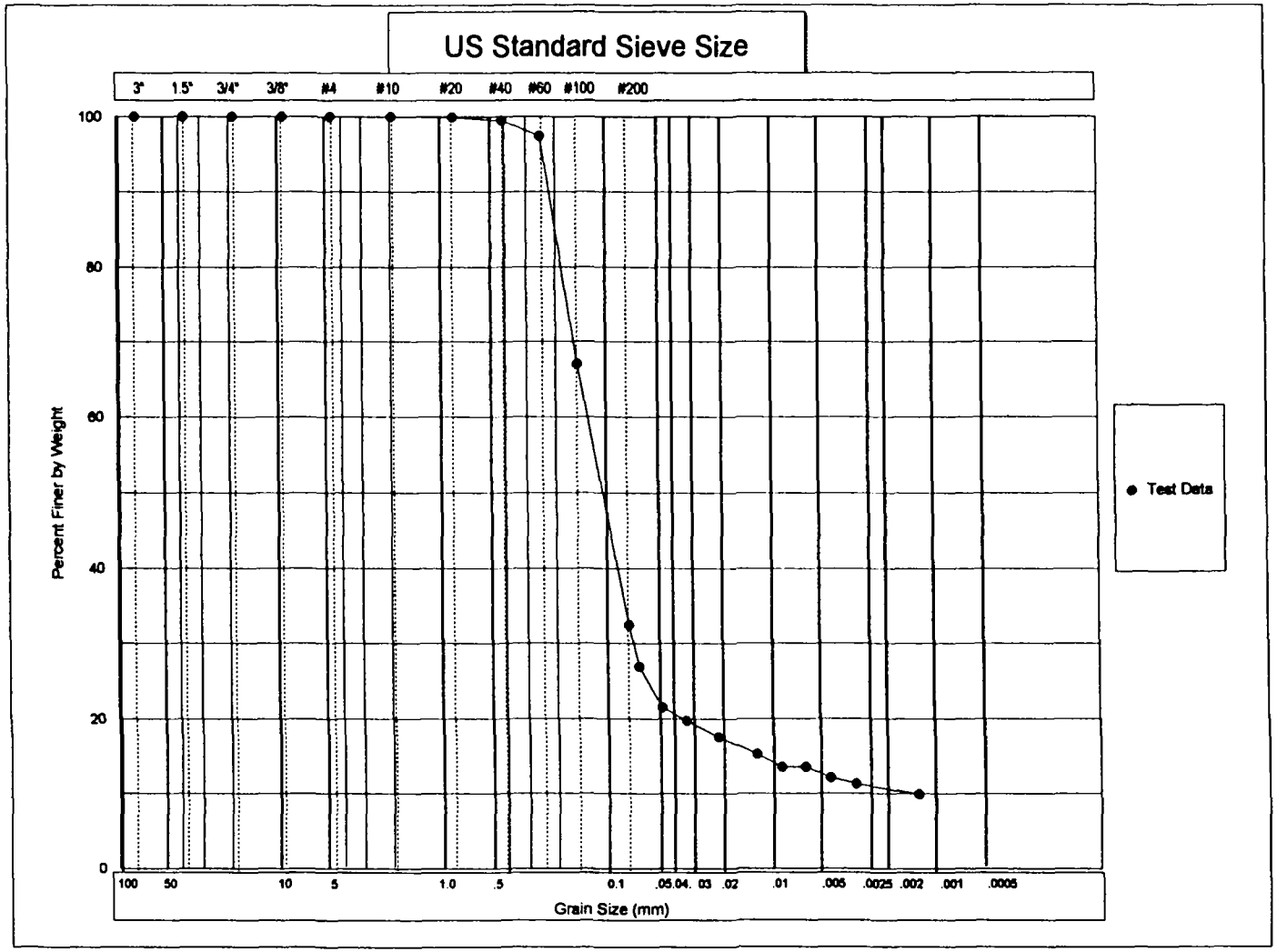


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc.
Depth: 30.5' - 32.5'
Classification:

Boring No.: Repository
Job Number: 2473-01

Sample No.: MPE-US

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT RMT, Inc.

JOB NO. 2473-01

BORING NO.	Repository	SAMPLED	10/01/00
DEPTH	39.0' - 40.5'	DATE TESTED	11/30/00 MC
SAMPLE NO.	MPE-UC1	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	62.24
Wt. Dry Soil & Pan (g)	61.62
Wt. Lost Moisture (g)	0.62
Wt. of Pan Only (g)	3.72
Wt. of Dry Soil (g)	57.90
Moisture Content %	1.1
Wt. Hydrom. Sample Wet (g)	59.64
Wt. Hydrom. Sample Dry (g)	59.01

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	602.61
Weight of + #10 Before Washing (g)	9.10
Weight of + #10 After Washing (g)	6.03
Weight of - #10 Wet (g)	593.51
Weight of - #10 Dry (g)	590.26
Wt. Total Sample Dry (g)	596.29
Calc. Wt. "W" (g)	59.61
Calc. Mass + #10	0.60

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	2.07	2.07	2.07	0.3	99.7
#10	0.00	3.96	3.96	6.03	1.0	99.0
#20	2.36	3.60	1.24	1.24	3.1	96.9
#40	2.37	3.81	1.44	2.68	5.5	94.5
#60	2.34	4.78	2.44	5.12	9.6	90.4
#100	2.34	5.63	3.29	8.41	15.1	84.9
#200	2.34	5.90	3.56	11.97	21.1	78.9

Data entered by: MC Date: 12/04/2000
Data checked by: KP Date: 12/6/2000
FileName: RCH0UC19

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.	Repository	SAMPLED	10/01/00
DEPTH	39.0' - 40.5'	DATE TESTED	11/30/00 MC
SAMPLE NO.	MPE-UC1	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

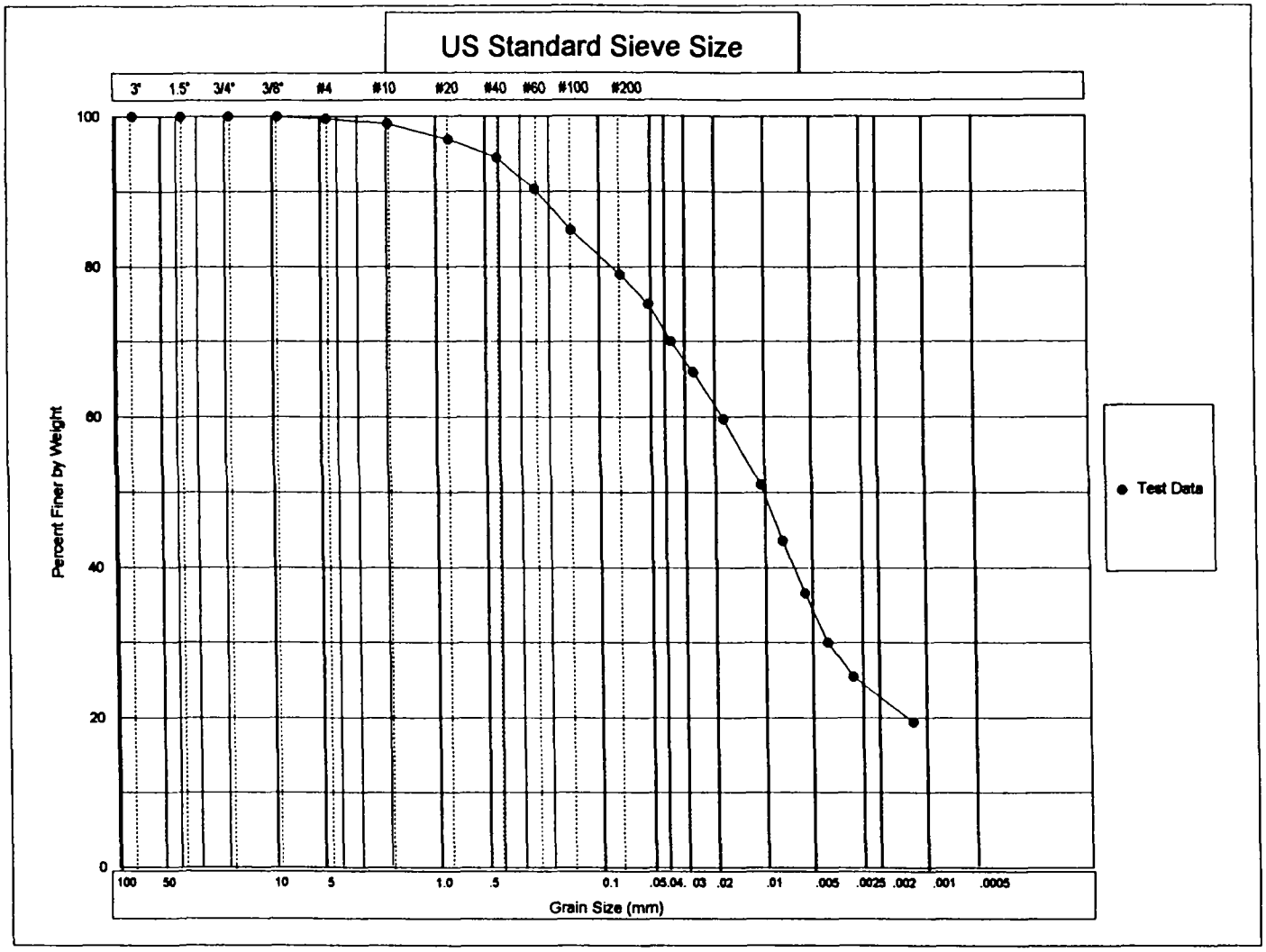
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.4
Sp. Gr. of Soil	2.74	Temp. Coef. K	0.01277
Value of "alpha"	0.98	Wt. Dry Sample "W"	59.612
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.5		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	–	–	–	–	–	–
0.5	51.00	45.50	75.0	75.0	7.93	0.0508
1.0	48.00	42.50	70.0	70.0	8.42	0.0370
2.0	45.50	40.00	65.9	65.9	8.83	0.0268
5.0	41.75	36.25	59.7	59.7	9.44	0.0175
15.0	36.50	31.00	51.1	51.1	10.30	0.0106
30.0	32.00	26.50	43.7	43.7	11.04	0.0077
60.0	27.75	22.25	36.7	36.7	11.74	0.0056
120.0	23.75	18.25	30.1	30.1	12.40	0.0041
250.0	21.00	15.50	25.5	25.5	12.85	0.0029
1444.0	17.25	11.75	19.4	19.4	13.46	0.0012

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/04/2000
Data checked by: KR Date: 12/10/2000
FileName: RCH0UC19

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc.
Depth: 39.0' - 40.5'
Classification:_____

Boring No.: Repository
Job Number: 2473-01

Sample No.: MPE-UC1

Advanced Terra Testing, Inc.

H

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT RMT, Inc.

JOB NO. 2473-01

BORING NO.		SAMPLED	10/2/00
DEPTH	5.25' - 7.25'	DATE TESTED	11/30/00 MC
SAMPLE NO.	I-1-23 SVE	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	70.52
Wt. Dry Soil & Pan (g)	68.88
Wt. Lost Moisture (g)	1.64
Wt. of Pan Only (g)	3.70
Wt. of Dry Soil (g)	65.18
Moisture Content %	2.5
Wt. Hydrom. Sample Wet (g)	56.72
Wt. Hydrom. Sample Dry (g)	55.33

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	472.93
Weight of + #10 Before Washing (g)	0.18
Weight of + #10 After Washing (g)	0.12
Weight of - #10 Wet (g)	472.75
Weight of - #10 Dry (g)	461.21
Wt. Total Sample Dry (g)	461.33
Calc. Wt. "W" (g)	55.34
Calc. Mass + #10	0.01

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.12	0.12	0.12	0.0	100.0
#20	2.34	2.50	0.16	0.16	0.3	99.7
#40	2.34	2.65	0.31	0.47	0.9	99.1
#60	2.36	3.06	0.70	1.17	2.1	97.9
#100	2.36	3.38	1.02	2.19	4.0	96.0
#200	2.34	3.42	1.08	3.27	5.9	94.1

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH023SV

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	10/2/00
DEPTH	5.25' - 7.25'	DATE TESTED	11/30/00 MC
SAMPLE NO.	I-1-23 SVE	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.4
Sp. Gr. of Soil	2.73	Temp. Coef. K	0.01280
Value of "alpha"	0.98	Wt. Dry Sample "W"	55.340
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.5		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	55.00	49.50	88.0	88.0	7.27	0.0488
1.0	50.50	45.00	80.0	80.0	8.01	0.0362
2.0	46.50	41.00	72.9	72.9	8.66	0.0266
5.0	40.00	34.50	61.3	61.3	9.73	0.0179
15.0	32.50	27.00	48.0	48.0	10.96	0.0109
30.0	27.75	22.25	39.6	39.6	11.74	0.0080
60.0	24.75	19.25	34.2	34.2	12.23	0.0058
120.0	23.00	17.50	31.1	31.1	12.52	0.0041
250.0	21.00	15.50	27.6	27.6	12.85	0.0029
1451.0	19.75	14.25	25.3	25.3	13.05	0.0012

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH023SV

ADVANCED TERRA TESTING, INC.

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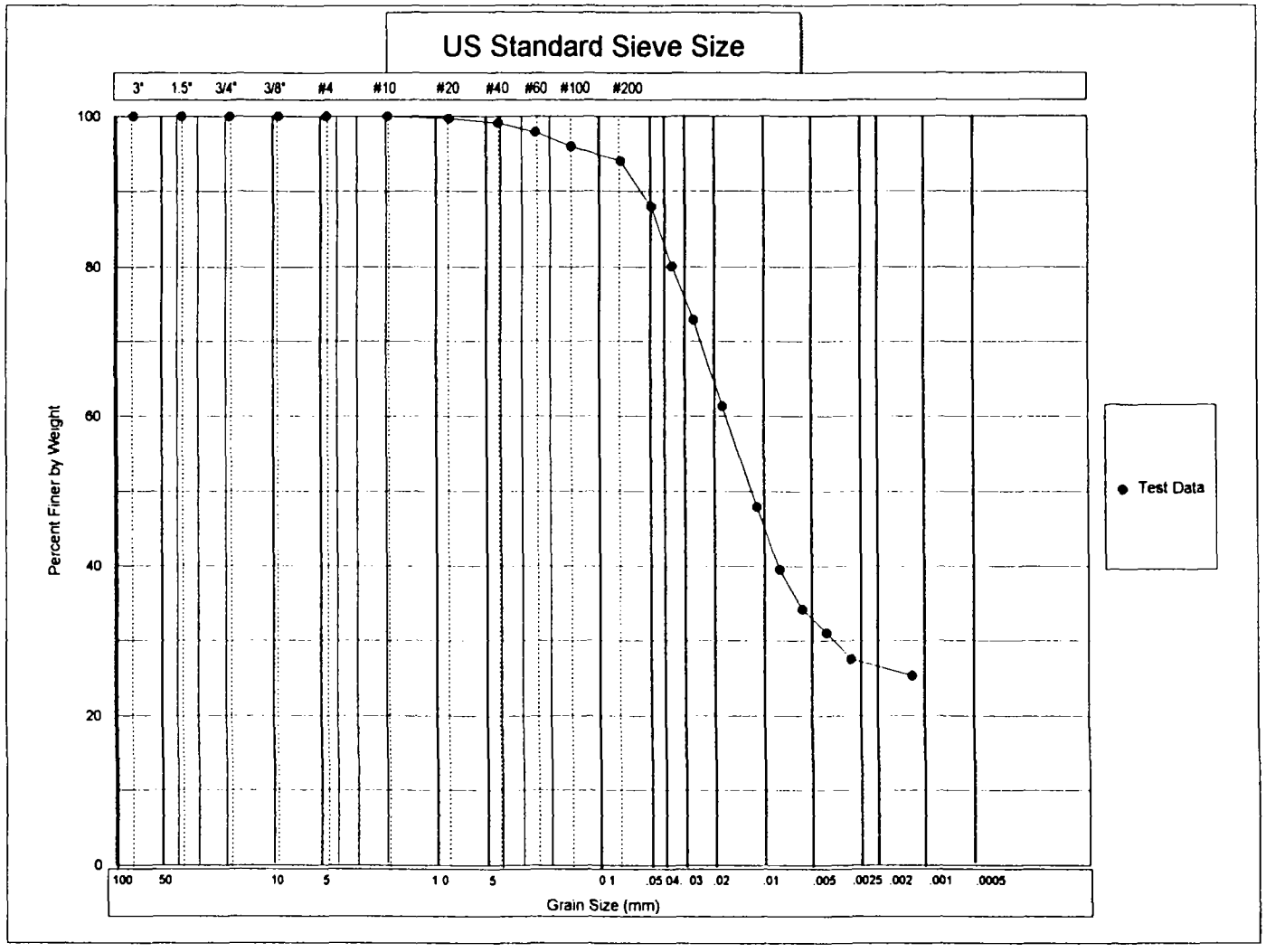


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc.
Depth: 5.25' - 7.25'
Classification:_____

Boring No.:
Job Number: 2473-01

Sample No.: I-1-23 SVE

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	10/13/00
DEPTH	32.0' - 34.5'	DATE TESTED	11/30/00 MC
SAMPLE NO.	I-1-23 US	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	56.04
Wt. Dry Soil & Pan (g)	55.95
Wt. Lost Moisture (g)	0.09
Wt. of Pan Only (g)	3.74
Wt. of Dry Soil (g)	52.21
Moisture Content %	0.2
Wt. Hydrom. Sample Wet (g)	89.25
Wt. Hydrom. Sample Dry (g)	89.10

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	373.86
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	373.86
Weight of - #10 Dry (g)	373.22
Wt. Total Sample Dry (g)	373.22
Calc. Wt. "W" (g)	89.10
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	2.37	2.55	0.18	0.18	0.2	99.8
#40	2.30	10.64	8.34	8.52	9.6	90.4
#60	2.35	43.92	41.57	50.09	56.2	43.8
#100	2.37	28.59	26.22	76.31	85.6	14.4
#200	2.31	8.98	6.67	82.98	93.1	6.9

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH023US

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	10/13/00
DEPTH	32.0' - 34.5'	DATE TESTED	11/30/00 MC
SAMPLE NO.	I-1-23 US	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

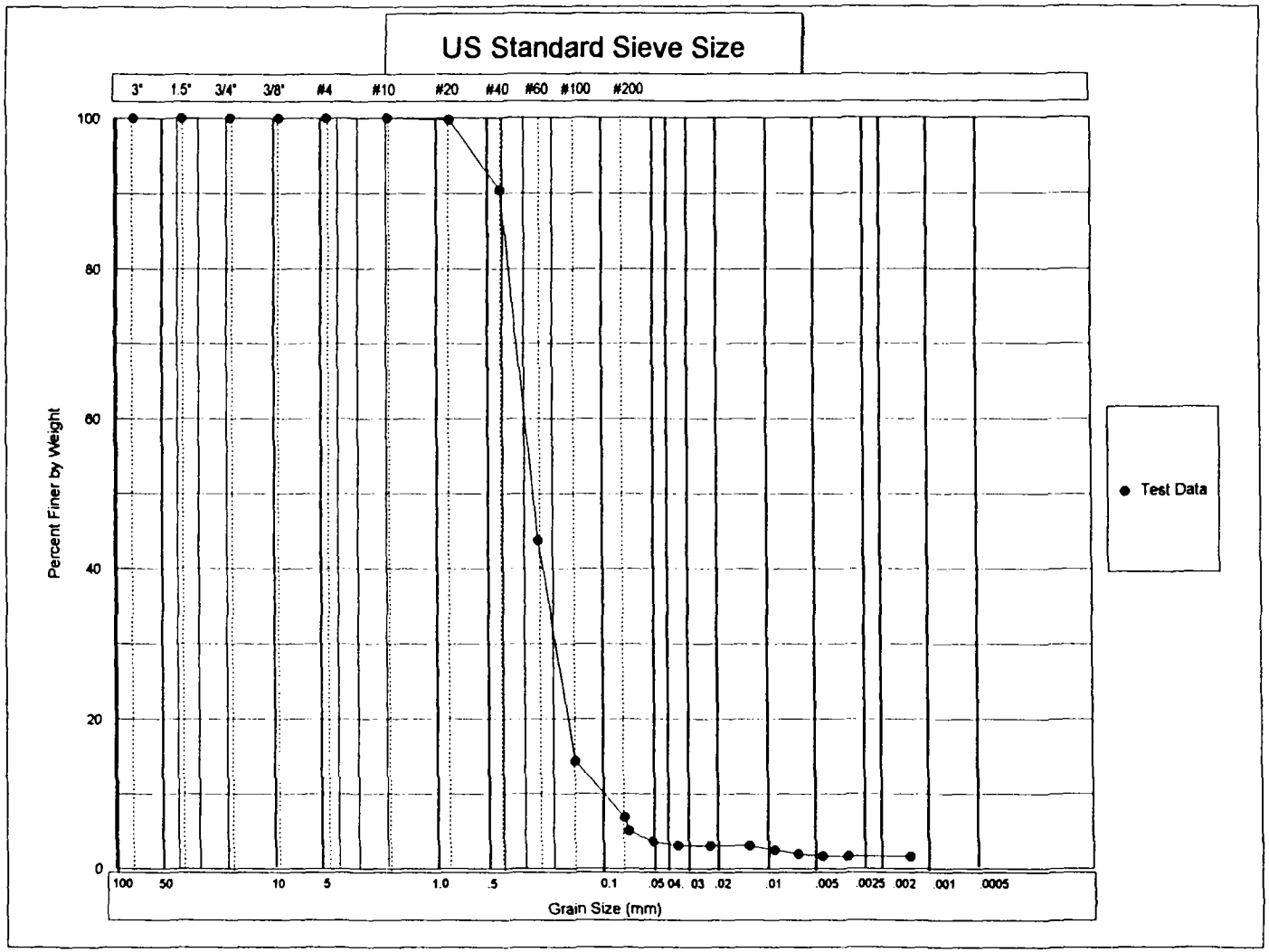
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.4
Sp. Gr. of Soil	2.68	Temp. Coef. K	0.01299
Value of "alpha"	0.99	Wt. Dry Sample "W"	89.099
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.5		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	10.00	4.50	5.0	5.0	14.65	0.0703
1.0	8.75	3.25	3.6	3.6	14.86	0.0501
2.0	8.25	2.75	3.1	3.1	14.94	0.0355
5.0	8.25	2.75	3.1	3.1	14.94	0.0224
15.0	8.25	2.75	3.1	3.1	14.94	0.0130
30.0	7.75	2.25	2.5	2.5	15.02	0.0092
60.0	7.25	1.75	2.0	2.0	15.10	0.0065
120.0	7.00	1.50	1.7	1.7	15.14	0.0046
250.0	7.00	1.50	1.7	1.7	15.14	0.0032
1441.0	7.00	1.50	1.7	1.7	15.14	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH023US

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc.
Depth: 32.0' - 34.5'
Classification:_____

Boring No.:
Job Number: 2473-01

Sample No : I-1-23 US

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	9/27/00
DEPTH	6.0' - 8.0'	DATE TESTED	11/30/00 MC
SAMPLE NO.	I-1-2 SVE	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes	
NATURAL	No	
Wt. Wet Soil & Pan (g)		50.63
Wt. Dry Soil & Pan (g)		49.77
Wt. Lost Moisture (g)		0.86
Wt. of Pan Only (g)		3.77
Wt. of Dry Soil (g)		46.00
Moisture Content %		1.9
Wt. Hydrom. Sample Wet (g)		58.84
Wt. Hydrom. Sample Dry (g)		57.76

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	509.43
Weight of + #10 Before Washing (g)	21.39
Weight of + #10 After Washing (g)	17.17
Weight of - #10 Wet (g)	488.04
Weight of - #10 Dry (g)	483.23
Wt. Total Sample Dry (g)	500.40
Calc. Wt. "W" (g)	59.82
Calc. Mass + #10	2.05

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	12.19	12.19	12.19	2.4	97.6
#4	0.00	1.00	1.00	13.19	2.6	97.4
#10	0.00	3.98	3.98	17.17	3.4	96.6
#20	2.34	3.25	0.91	0.91	5.0	95.0
#40	2.36	3.92	1.56	2.47	7.6	92.4
#60	2.37	5.18	2.81	5.28	12.3	87.7
#100	2.36	6.02	3.66	8.94	18.4	81.6
#200	2.36	6.22	3.86	12.80	24.8	75.2

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH062SV

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	9/27/00
DEPTH	6.0' - 8.0'	DATE TESTED	11/30/00 MC
SAMPLE NO.	I-1-2 SVE	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

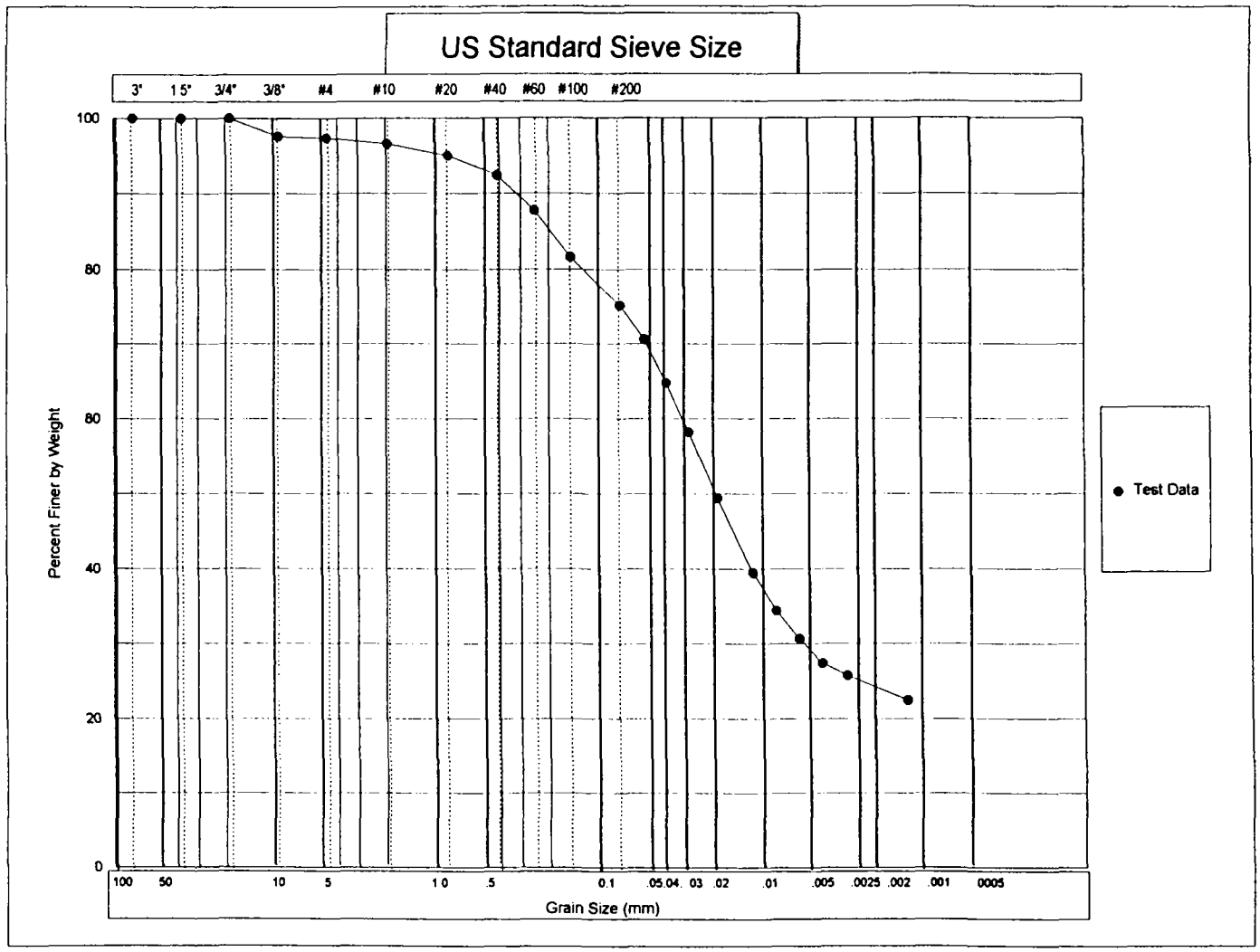
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.4
Sp. Gr. of Soil	2.68	Temp. Coef. K	0.01299
Value of "alpha"	0.99	Wt. Dry Sample "W"	59.816
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.5		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	48.00	42.50	70.6	70.6	8.42	0.0533
1.0	44.50	39.00	64.8	64.8	8.99	0.0389
2.0	40.50	35.00	58.2	58.2	9.65	0.0285
5.0	35.25	29.75	49.4	49.4	10.51	0.0188
15.0	29.25	23.75	39.5	39.5	11.49	0.0114
30.0	26.25	20.75	34.5	34.5	11.99	0.0082
60.0	24.00	18.50	30.7	30.7	12.35	0.0059
120.0	22.00	16.50	27.4	27.4	12.68	0.0042
250.0	21.00	15.50	25.8	25.8	12.85	0.0029
1440.0	19.00	13.50	22.4	22.4	13.17	0.0012

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH062SV

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc.
Depth: 6.0' - 8.0'
Classification:_____

Boring No.:
Job Number: 2473-01

Sample No.: I-1-2 SVE

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT RMT, Inc.

JOB NO. 2473-01

BORING NO.	Repository	SAMPLED	9/29/00
DEPTH	45.0' - 47.5'	DATE TESTED	11/30/00 MC
SAMPLE NO.	MPE-UC2	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	91.98
Wt. Dry Soil & Pan (g)	90.99
Wt. Lost Moisture (g)	0.99
Wt. of Pan Only (g)	3.68
Wt. of Dry Soil (g)	87.31
Moisture Content %	1.1
Wt. Hydrom. Sample Wet (g)	60.48
Wt. Hydrom. Sample Dry (g)	59.80

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	494.25
Weight of + #10 Before Washing (g)	8.55
Weight of + #10 After Washing (g)	7.17
Weight of - #10 Wet (g)	485.70
Weight of - #10 Dry (g)	481.62
Wt. Total Sample Dry (g)	488.79
Calc. Wt. "W" (g)	60.69
Calc. Mass + #10	0.89

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	4.53	4.53	4.53	0.9	99.1
#10	0.00	2.64	2.64	7.17	1.5	98.5
#20	2.35	3.34	0.99	0.99	3.1	96.9
#40	2.34	3.43	1.09	2.08	4.9	95.1
#60	2.36	4.09	1.73	3.81	7.7	92.3
#100	2.36	4.83	2.47	6.28	11.8	88.2
#200	2.38	5.09	2.71	8.99	16.3	83.7

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH045UC

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.	Repository	SAMPLED	9/29/00
DEPTH	45.0' - 47.5'	DATE TESTED	11/30/00 MC
SAMPLE NO.	MPE-UC2	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

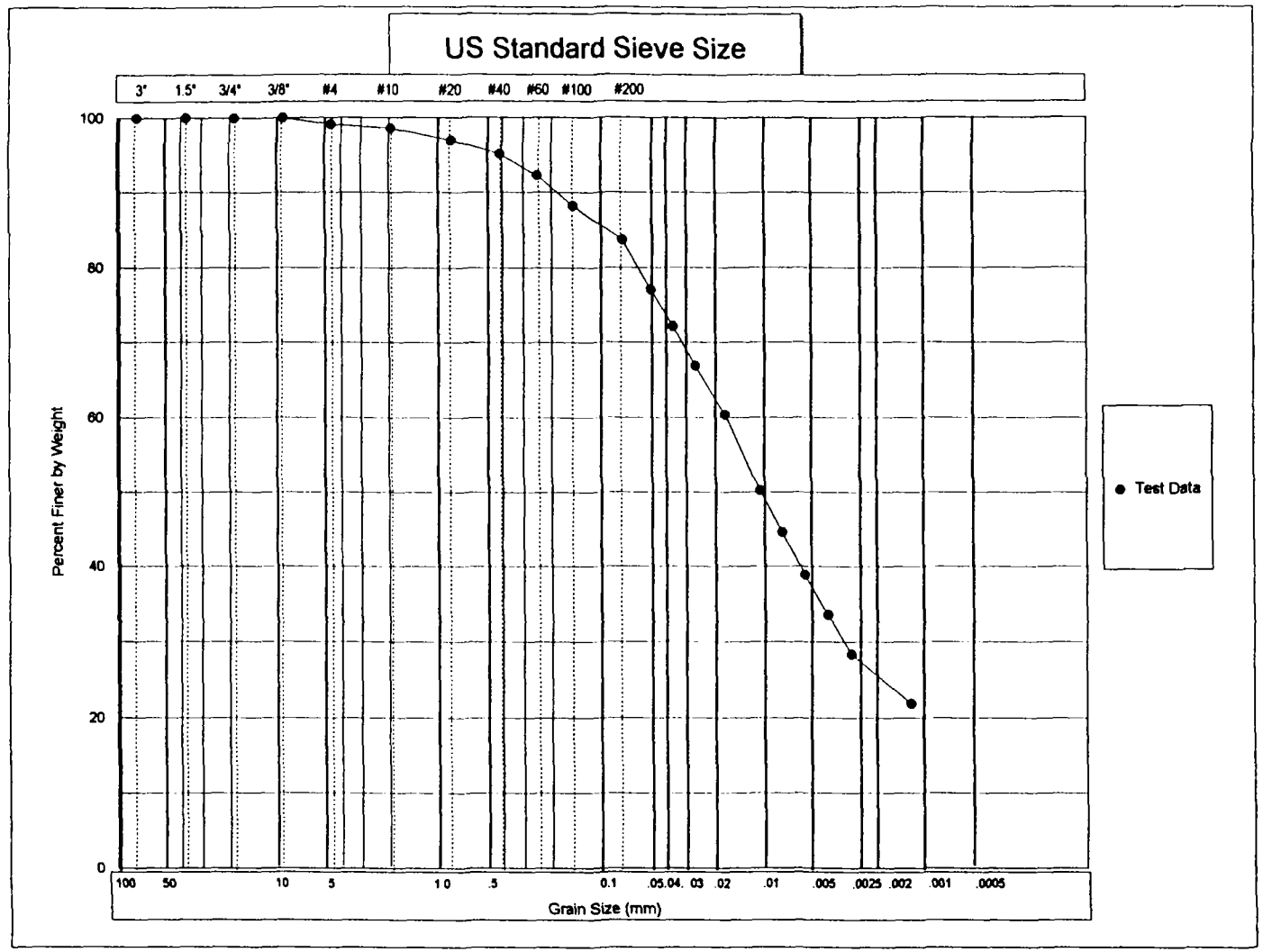
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.3
Sp. Gr. of Soil	2.73	Temp. Coef. K	0.01282
Value of "alpha"	0.98	Wt. Dry Sample "W"	60.691
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.5		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	53.00	47.50	77.0	77.0	7.60	0.0500
1.0	50.00	44.50	72.1	72.1	8.09	0.0365
2.0	46.75	41.25	66.9	66.9	8.62	0.0266
5.0	42.75	37.25	60.4	60.4	9.28	0.0175
15.0	36.50	31.00	50.3	50.3	10.30	0.0106
30.0	33.00	27.50	44.6	44.6	10.88	0.0077
60.0	29.50	24.00	38.9	38.9	11.45	0.0056
120.0	26.25	20.75	33.6	33.6	11.99	0.0041
250.0	23.00	17.50	28.4	28.4	12.52	0.0029
1440.0	19.00	13.50	21.9	21.9	13.17	0.0012

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH045UC

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc.
Depth: 45.0' - 47.5'
Classification:_____

Boring No.: Repository
Job Number: 2473-01

Sample No.: MPE-UC2

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	10/2/00
DEPTH	14.0' - 16.0'	DATE TESTED	11/30/00 MC
SAMPLE NO.	I-1-23 UC	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes	
NATURAL	No	
Wt. Wet Soil & Pan (g)		71.08
Wt. Dry Soil & Pan (g)		69.44
Wt. Lost Moisture (g)		1.64
Wt. of Pan Only (g)		3.71
Wt. of Dry Soil (g)		65.73
Moisture Content %		2.5
Wt. Hydrom. Sample Wet (g)		56.22
Wt. Hydrom. Sample Dry (g)		54.85

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	482.81
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	482.81
Weight of - #10 Dry (g)	471.06
Wt. Total Sample Dry (g)	471.06
Calc. Wt. "W" (g)	54.85
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	2.36	2.39	0.03	0.03	0.1	99.9
#40	2.29	2.33	0.04	0.07	0.1	99.9
#60	2.35	2.75	0.40	0.47	0.9	99.1
#100	2.31	3.76	1.45	1.92	3.5	96.5
#200	2.31	3.63	1.32	3.24	5.9	94.1

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH023UC

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	10/2/00
DEPTH	14.0' - 16.0'	DATE TESTED	11/30/00 MC
SAMPLE NO.	I-1-23 UC	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

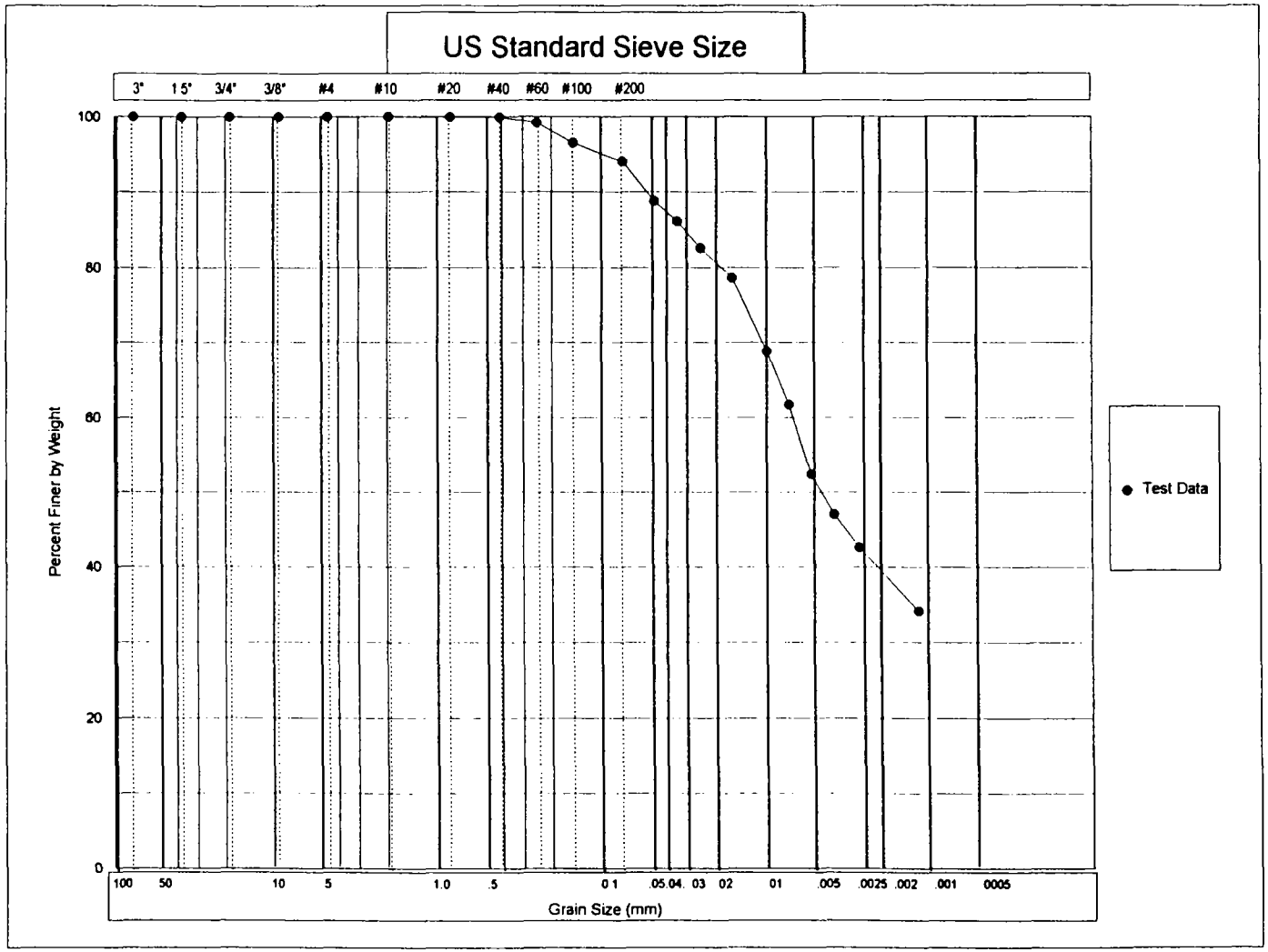
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.3
Sp. Gr. of Soil	2.78	Temp. Coef. K	0.01264
Value of "alpha"	0.97	Wt. Dry Sample "W"	54.848
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.5		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	55.50	50.00	88.8	88.8	7.19	0.0479
1.0	54.00	48.50	86.1	86.1	7.43	0.0345
2.0	52.00	46.50	82.6	82.6	7.76	0.0249
5.0	49.75	44.25	78.6	78.6	8.13	0.0161
15.0	44.25	38.75	68.8	68.8	9.03	0.0098
30.0	40.25	34.75	61.7	61.7	9.69	0.0072
60.0	35.00	29.50	52.4	52.4	10.55	0.0053
120.0	32.00	26.50	47.1	47.1	11.04	0.0038
250.0	29.50	24.00	42.6	42.6	11.45	0.0027
1439.0	24.75	19.25	34.2	34.2	12.23	0.0012

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH023UC

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc.
Depth: 14.0' - 16.0'
Classification:

Boring No.:
Job Number: 2473-01

Sample No: I-1-23 UC

Advanced Terra Testing, Inc.

29

SPECIFIC GRAVITY
ASTM D 854

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT:	RMT, Inc.	JOB NO.	2473-01
SOIL DESCR.	#4781.06	LOCATION	Crab Orchard NWR

BORING NO.				Repository
DEPTH	5.25' - 7.25'	6.0' - 8.0'	32.0' - 34.5'	30.5' - 32.5'
SAMPLE NO.	I-1-23 SVE	I-1-2 SVE	I-1-23 US	MPE - US
DATE SAMPLED				
DATE TESTED	11/10/00 MC	11/10/00 MC	11/30/00 CAL	11/30/00 CAL
Pycnometer #	DD	II	6	2
Weight of oven dry soil (g) (Wo)	25.502	24.279	25.086	25.157
Weight of flask, soil, and water. (g) (Wb)	179.398	178.918	172.943	177.767
Temperature (deg. C) (Tx)	25.4	25.5	25.5	25.8
Weight of water & flask at Tx (from cal. curve)(Wa)	163.236	163.712	157.232	162.002
Specific Gravity*	2.73	2.68	2.68	2.68

BORING NO.	Repository		Repository
DEPTH	45.0' - 47.5'	14.0' - 16.0	39.0' - 40.5'
SAMPLE NO.	MPE - UC2	I-1-23 UC	MPE - UC1
DATE SAMPLED			
DATE TESTED	11/30/00 CAL	11/30/00 CAL	11/30/00 CAL
Pycnometer #	EE	3	DD
Weight of oven dry soil (g) (Wo)	25.429	25.034	25.523
Weight of flask, soil, and water. (g) (Wb)	179.518	178.535	179.455
Temperature (deg. C) (Tx)	25.7	25.6	25.5
Weight of water & flask at Tx (from cal. curve)(Wa)	163.391	162.504	163.236
Specific Gravity*	2.73	2.78	2.74

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: MC Date: 11/30/2000
Data checked by: CAL Date: 12/01/00
FileName: RCE0ISVE

ADVANCED TERRA TESTING, INC.

% CARBON SUMMARY

% Carbon Summary

Client: RMT, Inc.
Location: Crab Orchard NWR, #4781.06

Job Number: 2473-01
Date Tested: 10/24/00

Sample ID	Depth	% Carbon	% Carbonate as C	% Organic Carbon
I-1-23 SVE	5.25' - 7.25'	0.24	0.047	0.19
I-1-2 SVE	6.0' - 7.0'	0.18	0.006	0.17
I-1-23 UC	14.0' - 16.0'	0.13	<0.005	0.13
Repository MPE-UC2	45.0' - 47.5'	2.37	1.880	0.49
Repository MPE-UC1	39.0' - 40.5'	2.00	1.580	0.42
Repository MPE-US	30.5' - 32.5'	0.11	0.015	0.10
I-1-23 US	32.0' - 34.5'	0.16	0.096	0.07

All results are reported on the dry basis

ADVANCED TERRA TESTING, inc

Data entry by: MC
Checked by: CM
FileName: RCZ033M1

Date: 11/21/2000
Date: 12/01/00

TRIAXIAL, BACK-PRESSURE
PERMEABILITY/COMPATIBILITY TESTING
TX/PBP
ASTM D 5084

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-43	SAMPLED	
DEPTH	10.0' - 12.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.	F	TEST FINISHED	10/26/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	2P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	470.2	467.6
Wt. Wet Soil & Pan (g)	478.4	475.8
Wt. Dry Soil & Pan (g)	390.2	390.2
Wt. Lost Moisture (g)	88.2	85.5
Wt. of Pan Only (g)	8.2	8.2
Wt. of Dry Soil (g)	382.0	382.0
Moisture Content %	23.1	22.4
Wet Density PCF	127.2	130.0
Dry Density PCF	103.3	106.2

Init. Diameter (in)	2.405	(cm)	6.109
Init. Area (sq in)	4.543	(sq cm)	29.310
Init. Height (in)	3.100	(cm)	7.874
Vol. Bef. Consol. (cu ft)	0.00815		
Vol. After Consol. (cu ft)	0.00793		
Porosity %	38.08		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	10
Percentage of Pump setting	100
Q (cc/s)	3.38E-05
Height	3.040
Diameter	2.396
Pressure (psi)	0.414
Area after consol. (cm*cm)	29.081
Gradient	3.770
Permeability k (cm/s)	3.1E-07
Back Pressure (psi)	38.0
Cell Pressure (psi)	63.0
Ave. Effective Stress (psi)	24.793

Data entry by: MC Date: 10/27/2000
Checked by: CL Date: 10/27/00
FileName: RCP0WC43

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-43	SAMPLED	
DEPTH	10.0' - 12.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.	F	TEST FINISHED	10/26/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	2P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.0	10.2				
50.0		10.9	10.7	39.4	49.1	9.7	0.97

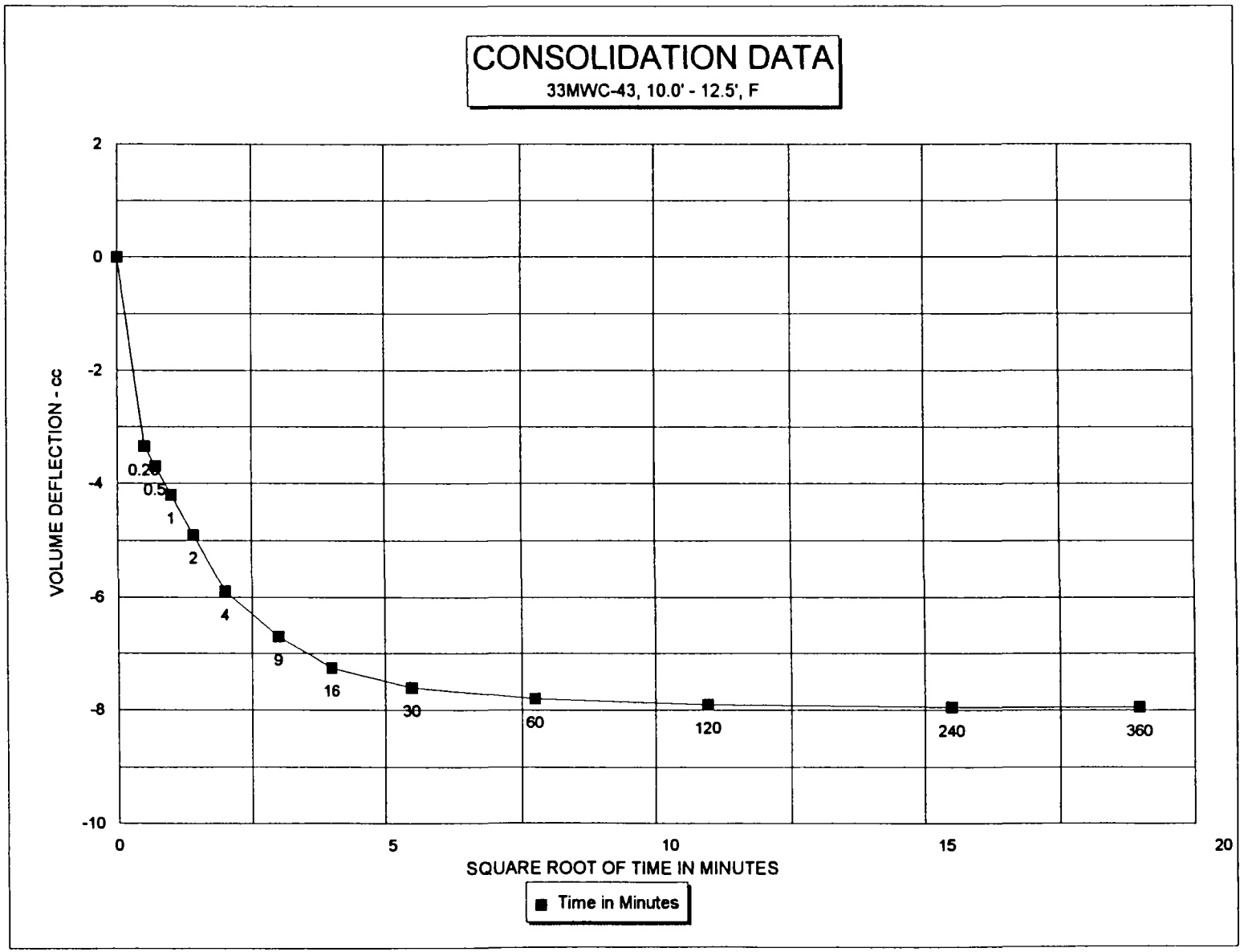
CONSOLIDATION DATA

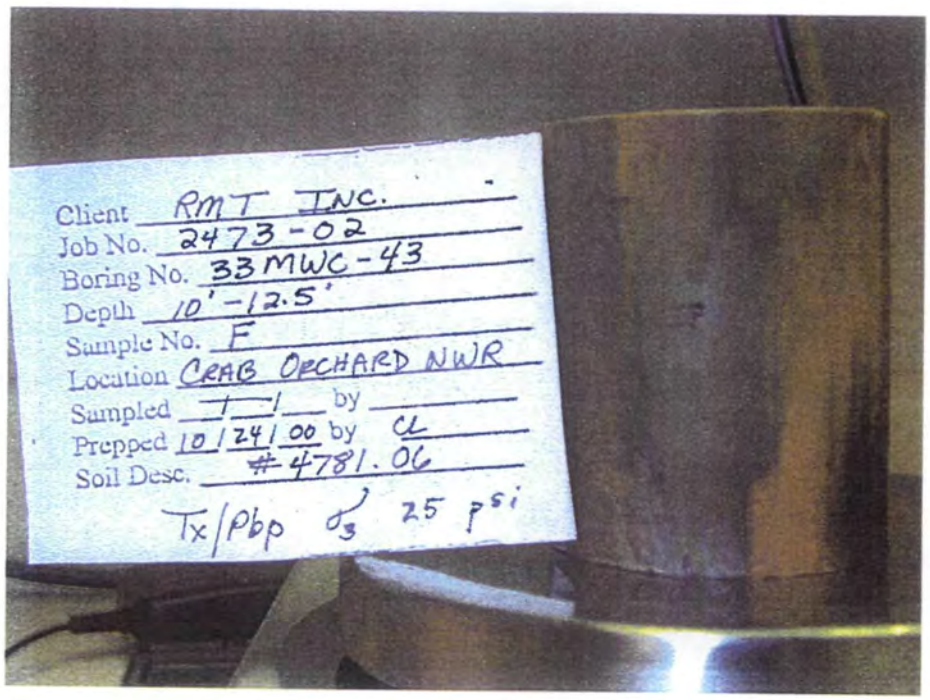
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	10.60	0.00
0.25	0.50	13.95	-3.35
0.5	0.71	14.30	-3.70
1	1.00	14.80	-4.20
2	1.41	15.50	-4.90
4	2.00	16.50	-5.90
9	3.00	17.30	-6.70
16	4.00	17.85	-7.25
30	5.48	18.20	-7.60
60	7.75	18.40	-7.80
120	10.95	18.50	-7.90
240	15.49	18.55	-7.95
360	18.97	18.55	-7.95

Initial Height (in)	3.100	Init. Vol. (CC)	230.81
Height Change (in)	0.060	Vol. Change (CC)	18.20
Ht. After Cons. (in)	3.040	Cell Exp. (CC)	11.98
Initial Area (sq in)	4.543	Net Change (CC)	6.22
Area After Cons. (sq in)	4.508	Cons. Vol. (CC)	224.59

Data entry by: MC Date: 10/27/2000
Checked by: cl Date: 10/27/00
FileName: RCP0WC43

ADVANCED TERRA TESTING, INC.


CONSOLIDATION DATA
33MWC-43, 10.0' - 12.5', F
VOLUME DEFLECTION - cc
2
0
-2
-4
-6
-8
-10
0.25
0.5
1
2
4
9
16
30
60
120
240
360
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
Time in Minutes



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10/26/00

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC-43	SAMPLED	
DEPTH	26.0' - 28.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.	N	TEST FINISHED	10/30/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	9P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	433.4	428.6
Wt. Wet Soil & Pan (g)	441.8	437.1
Wt. Dry Soil & Pan (g)	339.9	339.9
Wt. Lost Moisture (g)	101.9	97.2
Wt. of Pan Only (g)	8.4	8.4
Wt. of Dry Soil (g)	331.5	331.5
Moisture Content %	30.8	29.3
Wet Density PCF	122.2	122.1
Dry Density PCF	93.5	94.4

Init. Diameter (in)	2.403	(cm)	6.104
Init. Area (sq in)	4.535	(sq cm)	29.261
Init. Height (in)	2.978	(cm)	7.564
Vol. Bef. Consol. (cu ft)	0.00782		
Vol. After Consol. (cu ft)	0.00774		
Porosity %	44.34		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	12
Percentage of Pump setting	100
Q (cc/s)	6.78E-06
Height	2.895
Diameter	2.425
Pressure (psi)	1.851
Area after consol. (cm*cm)	29.798
Gradient	17.698
Permeability k (cm/s)	1.3E-08
Back Pressure (psi)	48.0
Cell Pressure (psi)	73.0
Ave. Effective Stress (psi)	24.075

Data entry by: MC Date: 11/01/2000
Checked by: SR Date: 11-1-00
FileName: RCP043N

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC-43	SAMPLED	
DEPTH	26.0' - 28.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.	N	TEST FINISHED	10/30/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	9P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.9	9.2				
50.0	48.0	11.9	12.7	39.4	48.6	9.2	0.92
60.0		12.9	13.1	49.3	59.1	9.8	0.98

CONSOLIDATION DATA

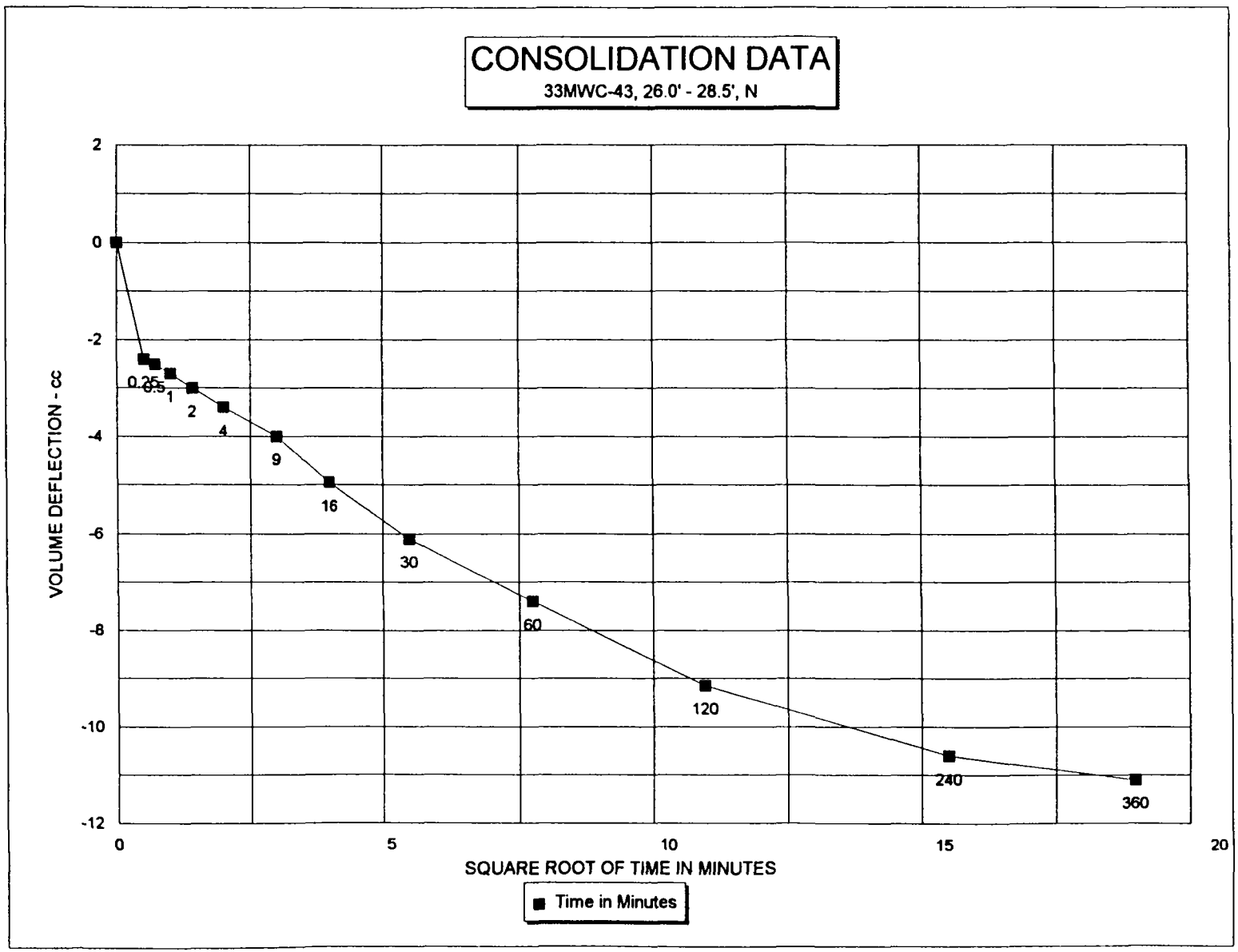
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.00	0.00
0.25	0.50	2.40	-2.40
0.5	0.71	2.50	-2.50
1	1.00	2.70	-2.70
2	1.41	3.00	-3.00
4	2.00	3.40	-3.40
9	3.00	4.00	-4.00
16	4.00	4.95	-4.95
30	5.48	6.10	-6.10
60	7.75	7.40	-7.40
120	10.95	9.15	-9.15
240	15.49	10.60	-10.60
360	18.97	11.10	-11.10

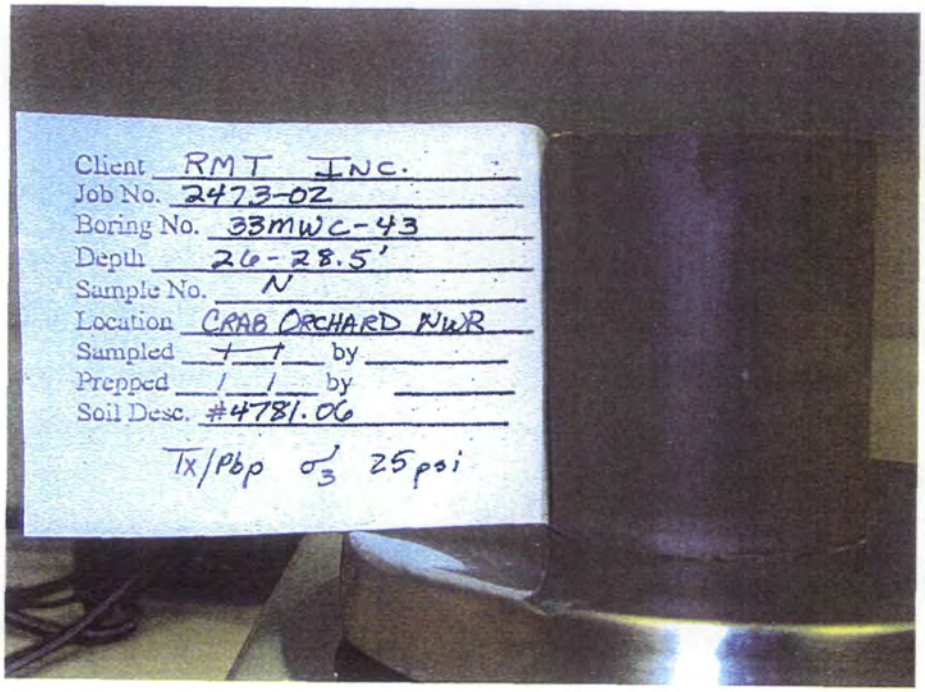
Initial Height (in)	2.978	Init. Vol. (CC)	221.36
Height Change (in)	0.083	Vol. Change (CC)	24.60
Ht. After Cons. (in)	2.895	Cell Exp. (CC)	22.39
Initial Area (sq in)	4.535	Net Change (CC)	2.21
Area After Cons. (sq in)	4.619	Cons. Vol. (CC)	219.15

Data entry by: MC Date: 11/01/2000
Checked by: SR Date: 11-1-00
FileName: RCP043N

ADVANCED TERRA TESTING, INC.

43


CONSOLIDATION DATA
33MWC-43, 26.0' - 28.5', N
VOLUME DEFLECTION - cc
2
0
-2
-4
-6
-8
-10
-12
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.5
1
2
4
9
16
30
60
120
240
360
Time in Minutes



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10/30/00

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT RMT Inc.

JOB NO. 2473-02

BORING NO.	33MWC-47	SAMPLED	
DEPTH	34.0' - 36.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.	R	TEST FINISHED	10/26/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	5P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	517.8	510.9
Wt. Wet Soil & Pan (g)	526.1	519.2
Wt. Dry Soil & Pan (g)	439.0	439.0
Wt. Lost Moisture (g)	87.0	80.2
Wt. of Pan Only (g)	8.3	8.3
Wt. of Dry Soil (g)	430.8	430.8
Moisture Content %	20.2	18.6
Wet Density PCF	132.4	134.6
Dry Density PCF	110.1	113.5

Init. Diameter (in)	2.413	(cm)	6.129
Init. Area (sq in)	4.573	(sq cm)	29.505
Init. Height (in)	3.258	(cm)	8.275
Vol. Bef. Consol. (cu ft)	0.00862		
Vol. After Consol. (cu ft)	0.00837		
Porosity %	33.82		

FLOW PUMP CALCULATIONS

Pump Setting	19
Velocity CM/Sec	1.25E-04
Q (cc/s)	3.99E-06
Height	3.153
Diameter	2.416
Pressure (psi)	1.216
Area after consol. (cm*cm)	29.583
Gradient	10.675
Permeability k (cm/s)	1.3E-08
Back Pressure (psi)	38.0
Cell Pressure (psi)	63.0
Ave. Effective Stress (psi)	24.392

Data entry by: MC Date: 10/30/2000
Checked by: CL Date: 11/01/00
FileName: RCP0WC47

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-47	SAMPLED	
DEPTH	34.0' - 36.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.	R	TEST FINISHED	10/26/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	5P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.9	8.7				
50.0		10.0	10.3	39.1	48.7	9.6	0.96

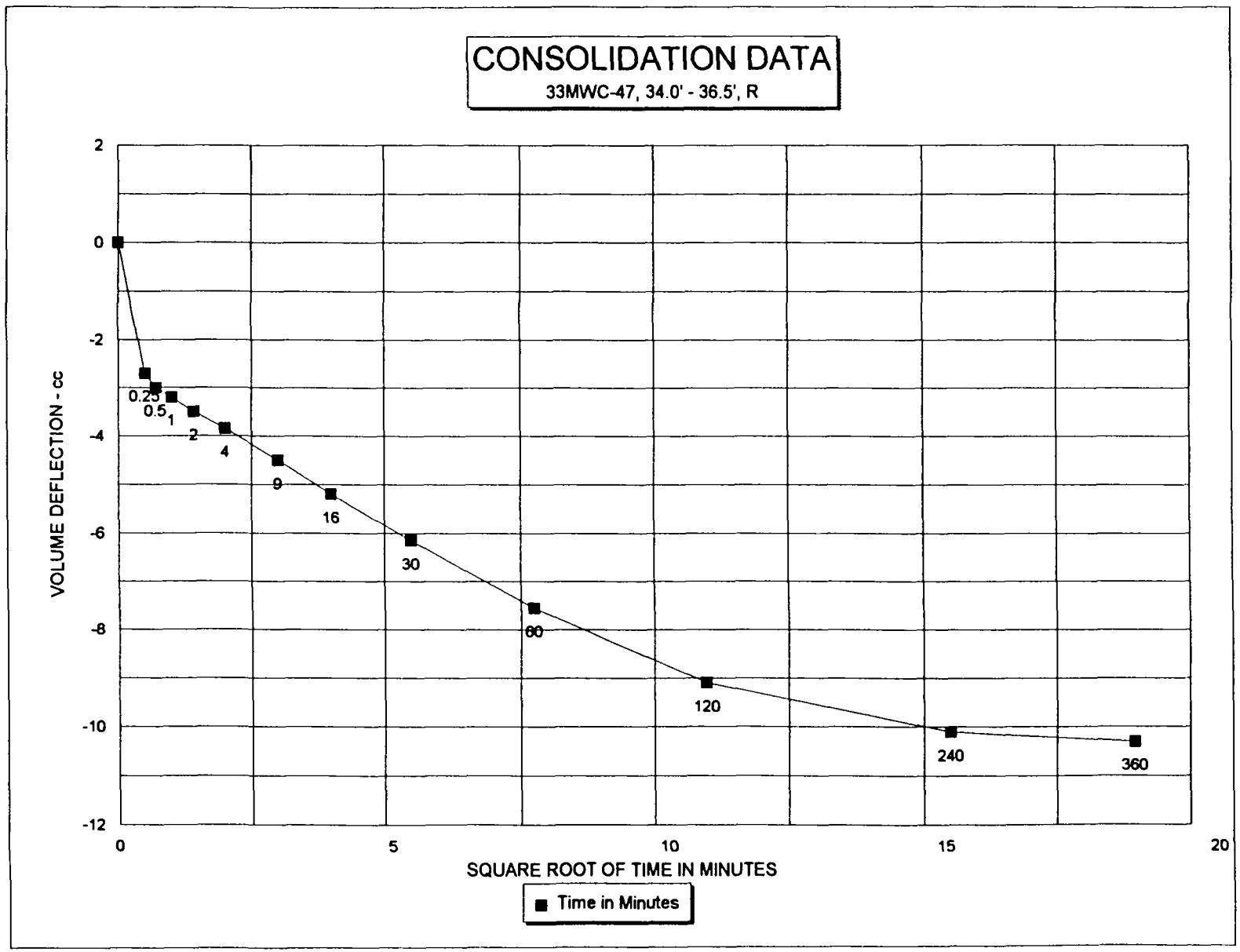
CONSOLIDATION DATA

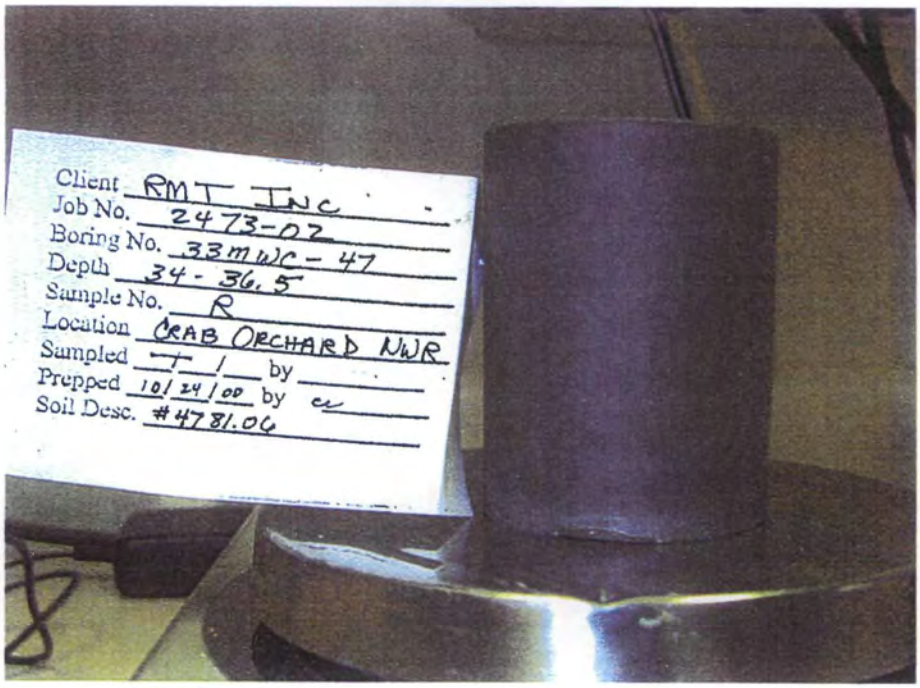
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	10.20	0.00
0.25	0.50	12.90	-2.70
0.5	0.71	13.20	-3.00
1	1.00	13.40	-3.20
2	1.41	13.70	-3.50
4	2.00	14.05	-3.85
9	3.00	14.70	-4.50
16	4.00	15.40	-5.20
30	5.48	16.35	-6.15
60	7.75	17.75	-7.55
120	10.95	19.30	-9.10
240	15.49	20.30	-10.10
360	18.97	20.50	-10.30

Initial Height (in)	3.258	Init. Vol. (CC)	244.19
Height Change (in)	0.105	Vol. Change (CC)	20.50
Ht. After Cons. (in)	3.153	Cell Exp. (CC)	13.27
Initial Area (sq in)	4.573	Net Change (CC)	7.23
Area After Cons. (sq in)	4.585	Cons. Vol. (CC)	236.96

Data entry by: MC Date: 10/30/2000
Checked by: CL Date: 11/01/00
FileName: RCP0WC47

ADVANCED TERRA TESTING, INC.


CONSOLIDATION DATA
33MWC-47, 34.0' - 36.5', R
VOLUME DEFLECTION - cc
2
0
-2
-4
-6
-8
-10
-12
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.5
1
2
4
9
16
30
60
120
240
360
Time in Minutes



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10/26/00

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-45	SAMPLED	
DEPTH	10.0' - 12.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.		TEST FINISHED	10/26/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	19S
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	458.3	453.8
Wt. Wet Soil & Pan (g)	466.7	462.2
Wt. Dry Soil & Pan (g)	384.9	384.9
Wt. Lost Moisture (g)	81.7	77.2
Wt. of Pan Only (g)	8.3	8.3
Wt. of Dry Soil (g)	376.6	376.6
Moisture Content %	21.7	20.5
Wet Density PCF	129.8	130.6
Dry Density PCF	106.6	108.4

Init. Diameter (in)	2.389	(cm)	6.068
Init. Area (sq in)	4.483	(sq cm)	28.921
Init. Height (in)	3.001	(cm)	7.623
Vol. Bef. Consol. (cu ft)	0.00778		
Vol. After Consol. (cu ft)	0.00766		
Porosity %	35.61		

FLOW PUMP CALCULATIONS

Pump Setting	19
Velocity CM/Sec	1.25E-04
Q (cc/s)	3.99E-06
Height	2.943
Diameter	2.393
Pressure (psi)	0.851
Area after consol. (cm*cm)	29.009
Gradient	8.004
Permeability k (cm/s)	1.7E-08
Back Pressure (psi)	38.0
Cell Pressure (psi)	63.0
Ave. Effective Stress (psi)	24.575

Data entry by: MC Date: 10/30/2000
Checked by: CL Date: 11/01/00
FileName: RCP0WC45

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-45	SAMPLED	
DEPTH	10.0' - 12.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.		TEST FINISHED	10/26/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	19S
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.5	10.7				
50.0		11.2	11.4	39.1	48.9	9.8	0.98

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	11.60	0.00
0.25	0.50	14.55	-2.95
0.5	0.71	14.75	-3.15
1	1.00	15.00	-3.40
2	1.41	15.35	-3.75
4	2.00	15.85	-4.25
9	3.00	16.70	-5.10
16	4.00	17.50	-5.90
30	5.48	18.60	-7.00
60	7.75	19.75	-8.15
120	10.95	20.40	-8.80
240	15.49	20.60	-9.00
360	18.97	20.60	-9.00

Initial Height (in)	3.001	Init. Vol. (CC)	220.48
Height Change (in)	0.058	Vol. Change (CC)	18.40
Ht. After Cons. (in)	2.943	Cell Exp. (CC)	14.81
Initial Area (sq in)	4.483	Net Change (CC)	3.59
Area After Cons. (sq in)	4.496	Cons. Vol. (CC)	216.89

Data entry by: MC Date: 10/30/2000
Checked by: a Date: 11/01/00
FileName: RCP0WC45

ADVANCED TERRA TESTING, INC.

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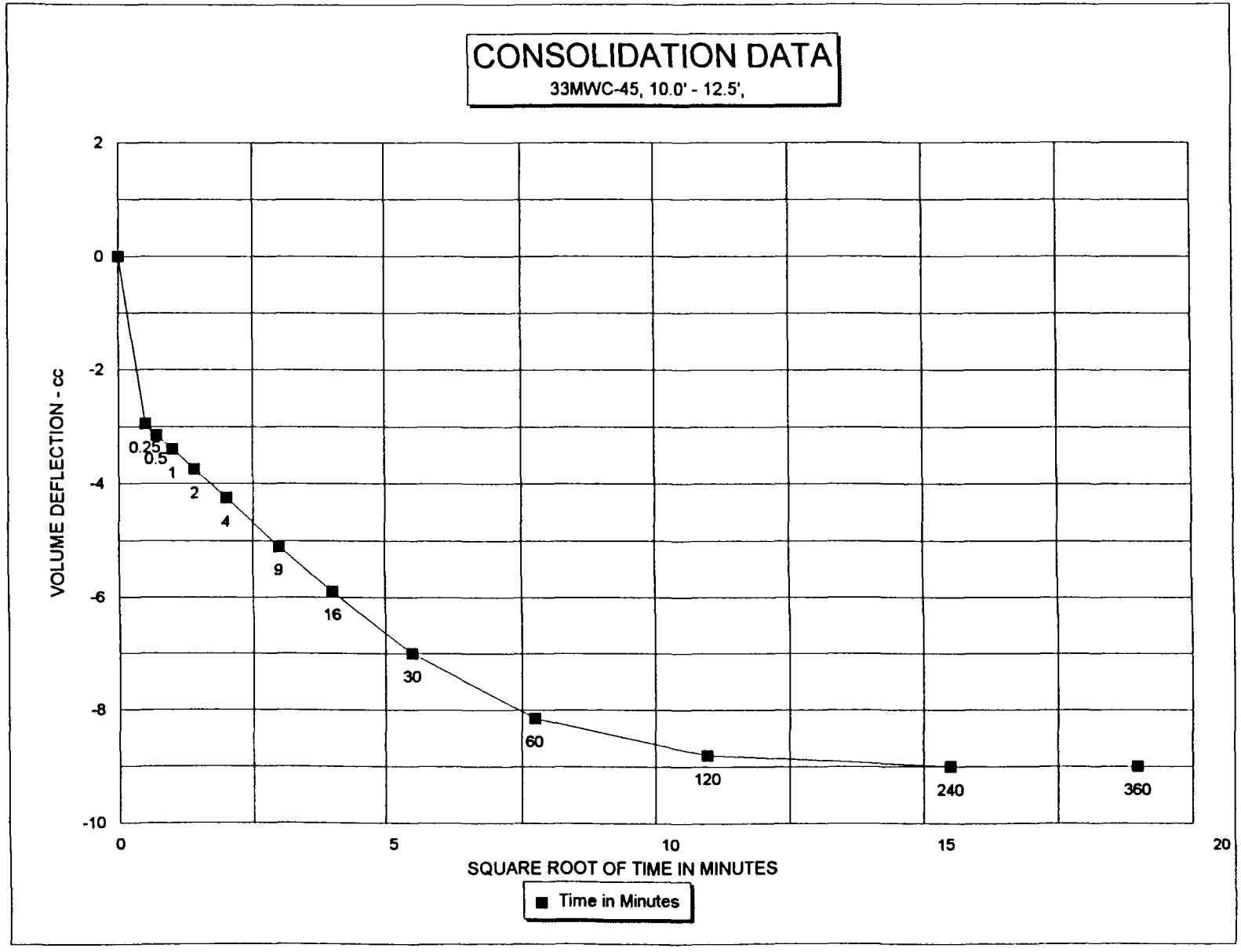
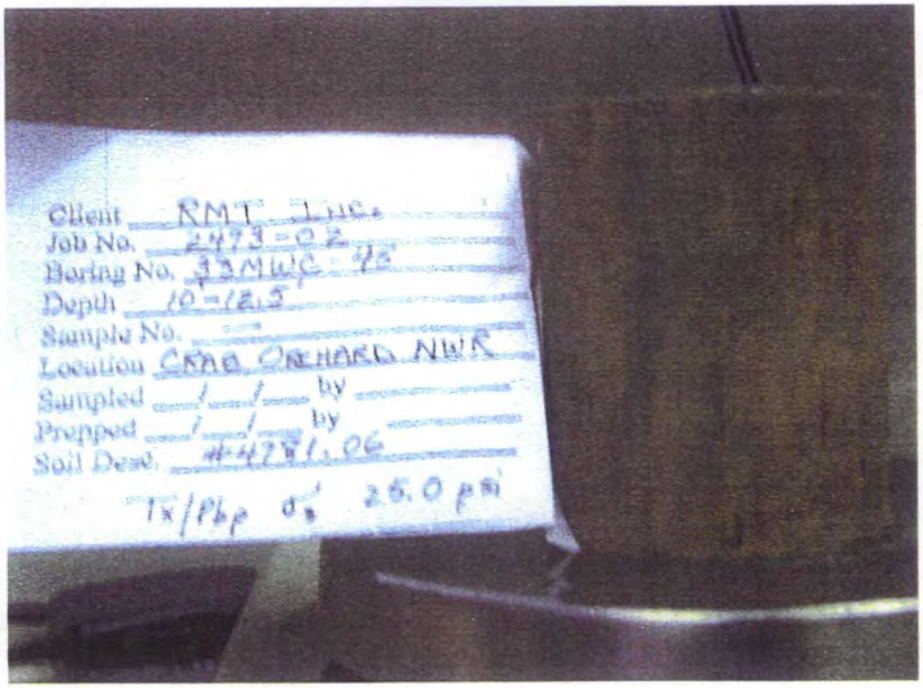

CONSOLIDATION DATA
33MWC-45, 10.0' - 12.5',
VOLUME DEFLECTION - cc
2
0
-2
-4
-6
-8
-10
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.5
1
2
4
9
16
30
60
120
240
360
Time in Minutes



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10/26/00

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-49	SAMPLED	
DEPTH	34.0' - 36.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.	R	TEST FINISHED	10/26/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	4P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	457.7	447.7
Wt. Wet Soil & Pan (g)	465.7	455.7
Wt. Dry Soil & Pan (g)	377.9	377.9
Wt. Lost Moisture (g)	87.8	77.8
Wt. of Pan Only (g)	8.0	8.0
Wt. of Dry Soil (g)	369.9	369.9
Moisture Content %	23.7	21.0
Wet Density PCF	129.0	133.3
Dry Density PCF	104.3	110.2

Init. Diameter (in)	2.402	(cm)	6.101
Init. Area (sq in)	4.531	(sq cm)	29.237
Init. Height (in)	2.982	(cm)	7.574
Vol. Bef. Consol. (cu ft)	0.00782		
Vol. After Consol. (cu ft)	0.00740		
Porosity %	37.09		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	12
Percentage of Pump setting	100
Q (cc/s)	6.78E-06
Height	2.932
Diameter	2.357
Pressure (psi)	0.440
Area after consol. (cm*cm)	28.143
Gradient	4.154
Permeability k (cm/s)	5.8E-08
Back Pressure (psi)	38.0
Cell Pressure (psi)	63.0
Ave. Effective Stress (psi)	24.780

Data entry by: MC Date: 10/30/2000
Checked by: ac Date: 11/01/00
FileName: RCP04934

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-49	SAMPLED	
DEPTH	34.0' - 36.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.	R	TEST FINISHED	10/26/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	4P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.9	8.7				
50.0		11.6	11.7	39.1	48.8	9.7	0.97

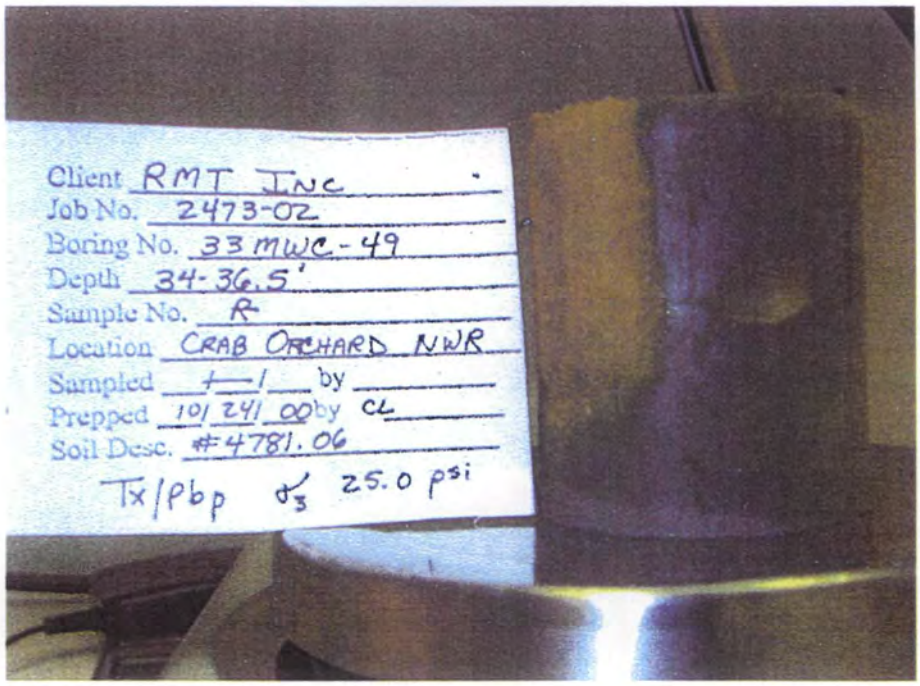
CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	11.70	0.00
0.25	0.50	14.45	-2.75
0.5	0.71	14.80	-3.10
1	1.00	15.30	-3.60
2	1.41	15.90	-4.20
4	2.00	16.70	-5.00
9	3.00	18.20	-6.50
16	4.00	19.40	-7.70
30	5.48	20.70	-9.00
60	7.75	21.40	-9.70
120	10.95	21.65	-9.95
240	15.49	21.75	-10.05
360	18.97	21.80	-10.10

Initial Height (in)	2.982	Init. Vol. (CC)	221.47
Height Change (in)	0.050	Vol. Change (CC)	21.30
Ht. After Cons. (in)	2.932	Cell Exp. (CC)	9.45
Initial Area (sq in)	4.531	Net Change (CC)	11.85
Area After Cons. (sq in)	4.362	Cons. Vol. (CC)	209.62

Data entry by: MC Date: 10/30/2000
Checked by: cu Date: 11/01/00
FileName: RCP04934

ADVANCED TERRA TESTING, INC.



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10/26/00

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-49	SAMPLED	
DEPTH	18.0' - 20.5'	TEST STARTED	10/23/00 CL
SAMPLE NO.	J	TEST FINISHED	10/25/00 CL
SOIL DESCR.	Proj # 4781.06	CELL NUMBER	3P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	556.1	551.1
Wt. Wet Soil & Pan (g)	564.2	559.2
Wt. Dry Soil & Pan (g)	460.5	460.5
Wt. Lost Moisture (g)	103.8	98.7
Wt. of Pan Only (g)	8.1	8.1
Wt. of Dry Soil (g)	452.3	452.3
Moisture Content %	22.9	21.8
Wet Density PCF	127.5	132.0
Dry Density PCF	103.7	108.3

Init. Diameter (in)	2.416	(cm)	6.137
Init. Area (sq in)	4.584	(sq cm)	29.579
Init. Height (in)	3.623	(cm)	9.202
Vol. Bef. Consol. (cu ft)	0.00961		
Vol. After Consol. (cu ft)	0.00921		
Porosity %	37.87		

FLOW PUMP CALCULATIONS

Pump Setting	19
Velocity CM/Sec	1.25E-04
Q (cc/s)	3.99E-06
Height	3.561
Diameter	2.385
Pressure (psi)	0.477
Area after consol. (cm*cm)	28.823
Gradient	3.708
Permeability k (cm/s)	3.7E-08
Back Pressure (psi)	38.0
Cell Pressure (psi)	63.0
Ave. Effective Stress (psi)	24.762

Data entry by: MC Date: 11/01/2000
Checked by: CL Date: 11/02/00
FileName: RCP0WC49

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-49	SAMPLED	
DEPTH	18.0' - 20.5'	TEST STARTED	10/23/00 CL
SAMPLE NO.	J	TEST FINISHED	10/25/00 CL
SOIL DESCR.	Proj # 4781.06	SETUP NO.	3P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.4	9.4				
50.0		10.5	10.7	39.0	48.7	9.7	0.97

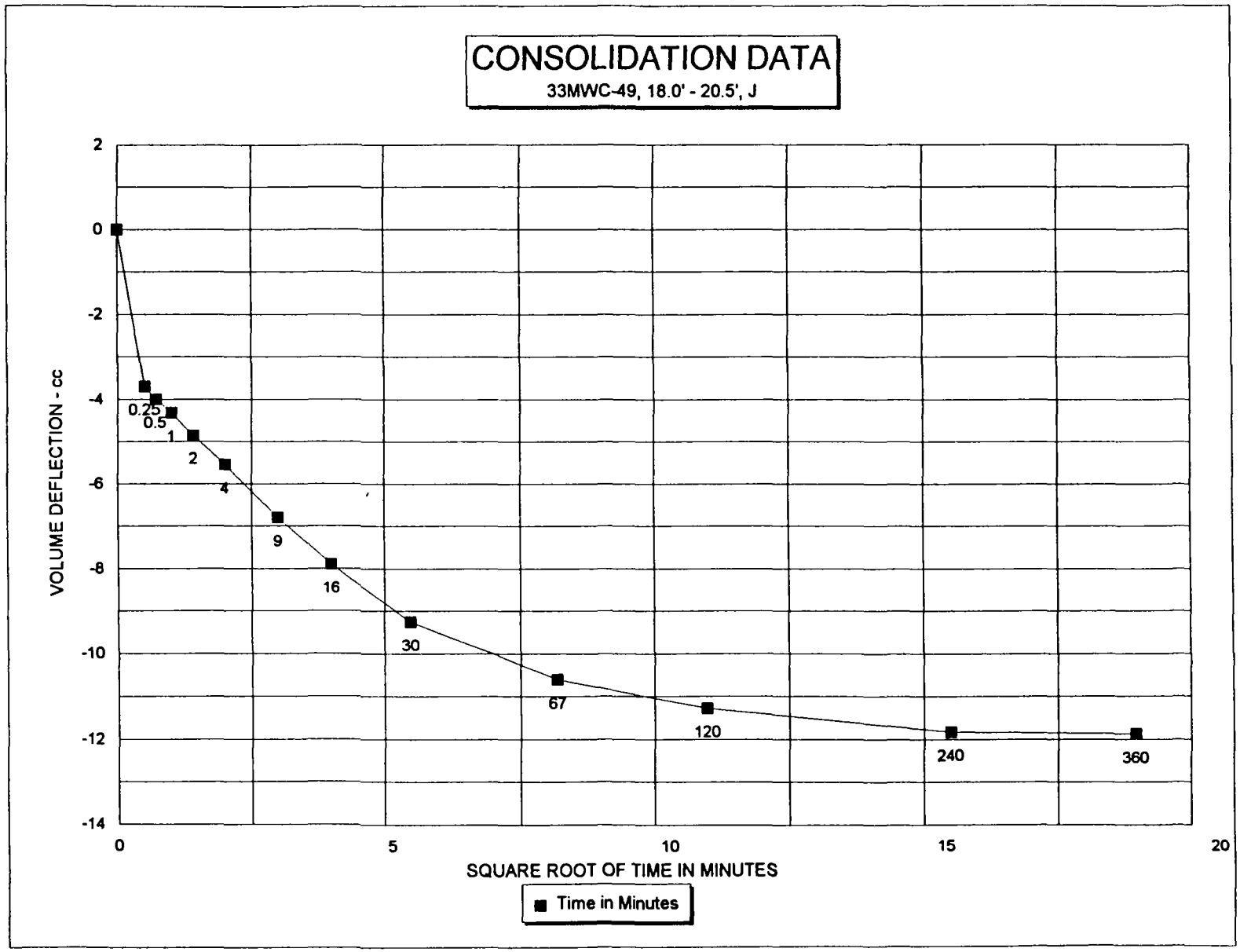
CONSOLIDATION DATA

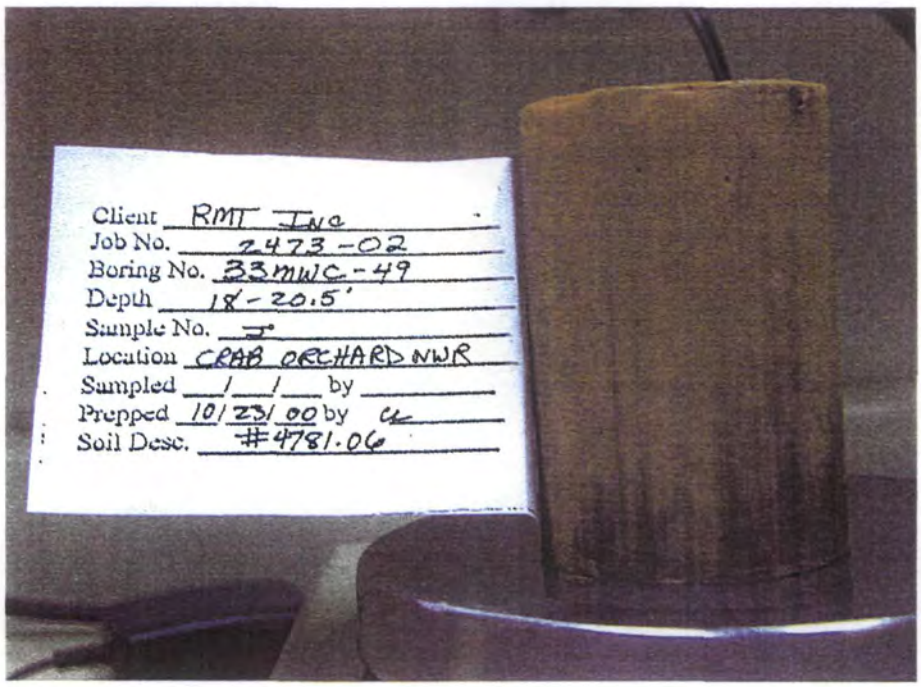
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.00	0.00
0.25	0.50	3.70	-3.70
0.5	0.71	4.00	-4.00
1	1.00	4.33	-4.33
2	1.41	4.85	-4.85
4	2.00	5.55	-5.55
9	3.00	6.80	-6.80
16	4.00	7.90	-7.90
30	5.48	9.25	-9.25
67	8.19	10.60	-10.60
120	10.95	11.28	-11.28
240	15.49	11.83	-11.83
360	18.97	11.88	-11.88

Initial Height (in)	3.623	Init. Vol. (CC)	272.23
Height Change (in)	0.062	Vol. Change (CC)	22.00
Ht. After Cons. (in)	3.561	Cell Exp. (CC)	10.52
Initial Area (sq in)	4.584	Net Change (CC)	11.48
Area After Cons. (sq in)	4.468	Cons. Vol. (CC)	260.75

Data entry by: MC Date: 11/01/2000
Checked by: CL Date: 11/02/00
FileName: RCP0WC49

ADVANCED TERRA TESTING, INC.


CONSOLIDATION DATA
33MWC-49, 18.0' - 20.5', J
VOLUME DEFLECTION - cc
2
0
-2
-4
-6
-8
-10
-12
-14
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.5
1
2
4
9
16
30
67
120
240
360
Time in Minutes



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10/24/00

TRIAXIAL, BACK-PRESSURE
PERMEABILITY/COMPATIBILITY TESTING
TX/PBP
ASTM D 5084

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	10/3/00
DEPTH	32.0' - 34.5'	TEST STARTED	10/20/00 CL
SAMPLE NO.	I-1-23-US	TEST FINISHED	10/23/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	9P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	479.5	479.4
Wt. Wet Soil & Pan (g)	487.9	487.8
Wt. Dry Soil & Pan (g)	400.9	400.9
Wt. Lost Moisture (g)	87.0	86.9
Wt. of Pan Only (g)	8.4	8.4
Wt. of Dry Soil (g)	392.5	392.5
Moisture Content %	22.2	22.1
Wet Density PCF	125.4	122.7
Dry Density PCF	102.7	100.4

Init. Diameter (in)	2.375	(cm)	6.033
Init. Area (sq in)	4.430	(sq cm)	28.583
Init. Height (in)	3.287	(cm)	8.349
Vol. Bef. Consol. (cu ft)	0.00843		
Vol. After Consol. (cu ft)	0.00861		
Porosity %	35.62		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	2
Percentage of Pump setting	100
Q (cc/s)	1.70E-02
Height	3.272
Diameter	2.407
Pressure (psi)	0.037
Area after consol. (cm*cm)	29.353
Gradient	0.313
Permeability k (cm/s)	1.9E-03
Back Pressure (psi)	38.0
Cell Pressure (psi)	63.0
Ave. Effective Stress (psi)	24.982

Data entry by: MC Date: 10/24/2000
Checked by: ck Date: 10/24/00
FileName: RCP0I123

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	10/3/00
DEPTH	32.0' - 34.5'	TEST STARTED	10/20/00 CL
SAMPLE NO.	I-1-23-US	TEST FINISHED	10/23/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	9P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	3.1	10.5				
50.0		12.5	12.8	39.7	49.3	9.6	0.96

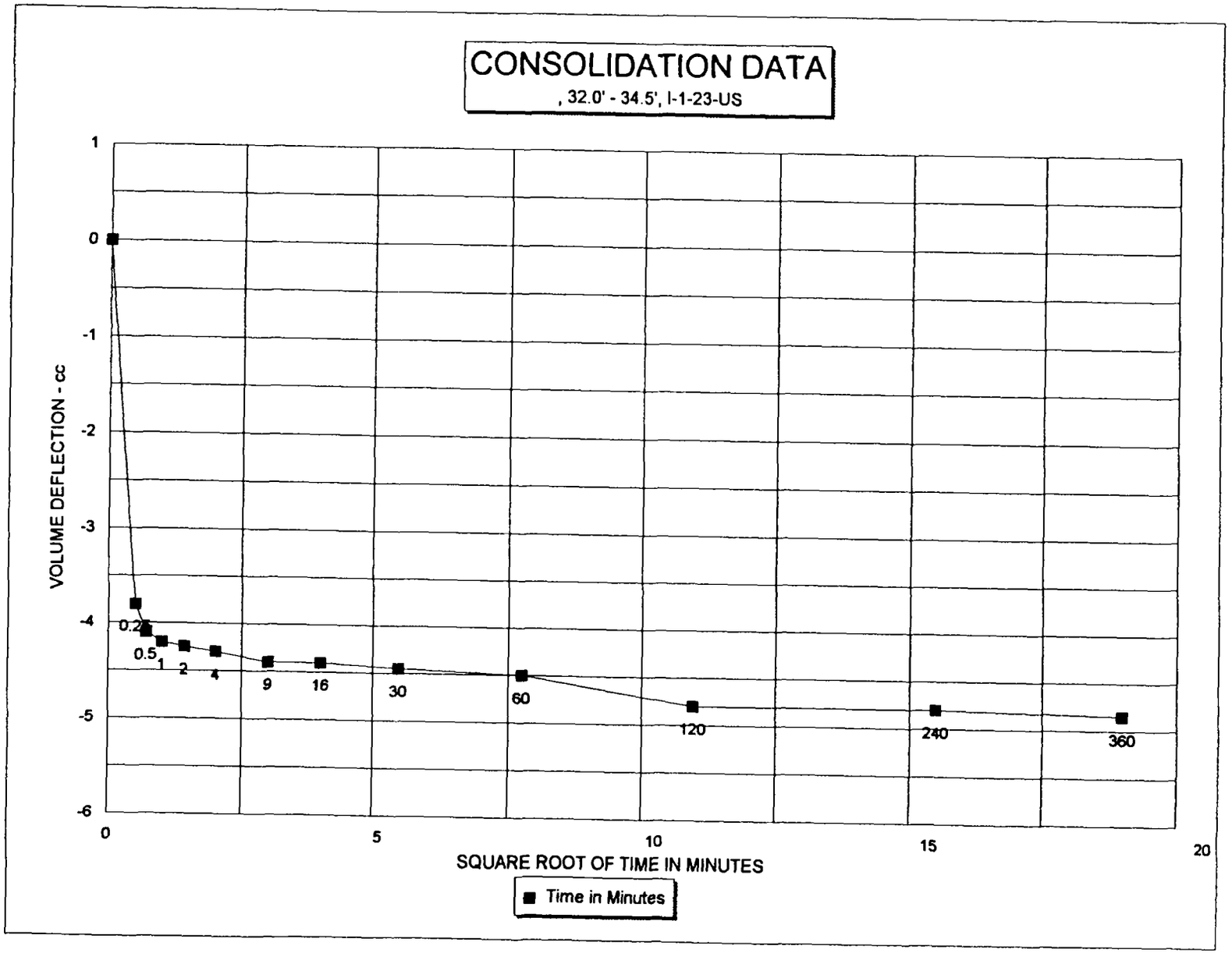
CONSOLIDATION DATA

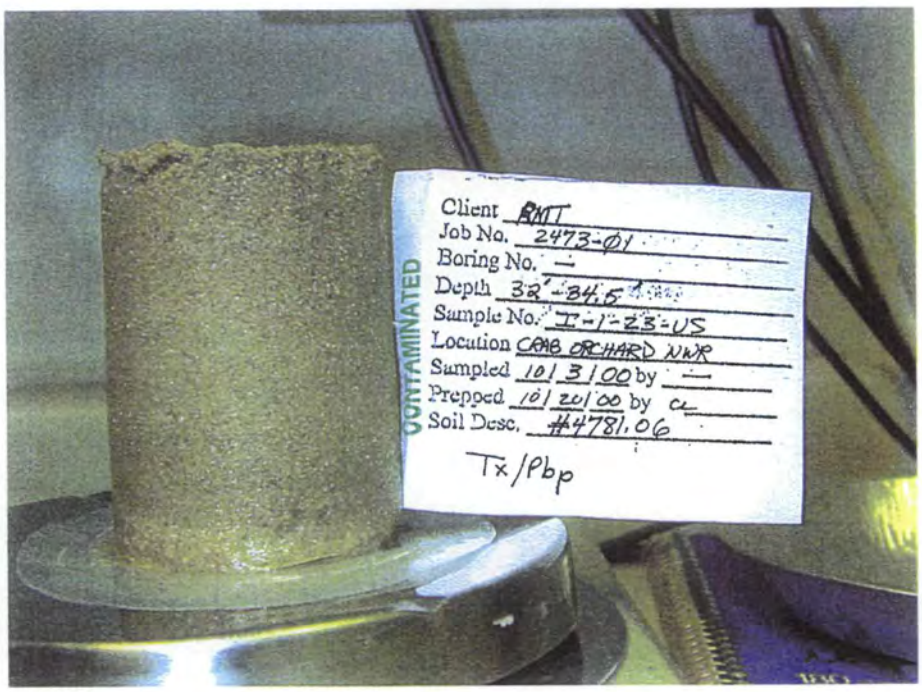
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	12.80	0.00
0.25	0.50	16.60	-3.80
0.5	0.71	16.90	-4.10
1	1.00	17.00	-4.20
2	1.41	17.05	-4.25
4	2.00	17.10	-4.30
9	3.00	17.20	-4.40
16	4.00	17.20	-4.40
30	5.48	17.25	-4.45
60	7.75	17.30	-4.50
120	10.95	17.60	-4.80
240	15.49	17.60	-4.80
360	18.97	17.65	-4.85

Initial Height (in)	3.287	Init. Vol. (CC)	238.67
Height Change (in)	0.015	Vol. Change (CC)	16.10
Ht. After Cons. (in)	3.272	Cell Exp. (CC)	21.42
Initial Area (sq in)	4.430	Net Change (CC)	-5.32
Area After Cons. (sq in)	4.550	Cons. Vol. (CC)	243.99

Data entry by: MC Date: 10/24/2000
Checked by: CL Date: 10/24/00
FileName: RCP0I123

ADVANCED TERRA TESTING, INC.


CONSOLIDATION DATA
, 32.0' - 34.5', I-1-23-US
VOLUME DEFLECTION - cc
1
0
-1
-2
-3
-4
-5
-6
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.2
0.5
1
2
4
9
16
30
60
120
240
360
Time in Minutes



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10/23/00

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	9/27/00
DEPTH	6.0' - 8.0'	TEST STARTED	10/19/00 CL
SAMPLE NO.	I-1-2 SVE	TEST FINISHED	10/23/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	3P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	720 5 psi	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	483.7	485.2
Wt. Wet Soil & Pan (g)	492.2	493.7
Wt. Dry Soil & Pan (g)	412.7	412.7
Wt. Lost Moisture (g)	79.4	81.0
Wt. of Pan Only (g)	8.5	8.5
Wt. of Dry Soil (g)	404.2	404.2
Moisture Content %	19.7	20.0
Wet Density PCF	131.4	134.0
Dry Density PCF	109.8	111.6

Init. Diameter (in)	2.401	(cm)	6.099
Init. Area (sq in)	4.528	(sq cm)	29.212
Init. Height (in)	3.097	(cm)	7.866
Vol. Bef. Consol. (cu ft)	0.00811		
Vol. After Consol. (cu ft)	0.00799		
Porosity %	35.82		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	12
Percentage of Pump setting	100
Q (cc/s)	6.78E-06
Height	3.085
Diameter	2.386
Pressure (psi)	2.230
Area after consol. (cm*cm)	28.856
Gradient	20.009
Permeability k (cm/s)	1.2E-08
Back Pressure (psi)	48.0
Cell Pressure (psi)	53.0
Ave. Effective Stress (psi)	3.885

Data entry by: MC Date: 10/24/2000
Checked by: CL Date: 10/24/00
FileName: RCP02SVE

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	9/27/00
DEPTH	6.0' - 8.0'	TEST STARTED	10/19/00 CL
SAMPLE NO.	I-1-2 SVE	TEST FINISHED	10/23/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	3P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	720	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	10.0	8.9				
50.0	48.0	9.9	11.2	38.9	48.2	9.3	0.93
60.0		11.7	11.9	49.2	58.7	9.5	0.95

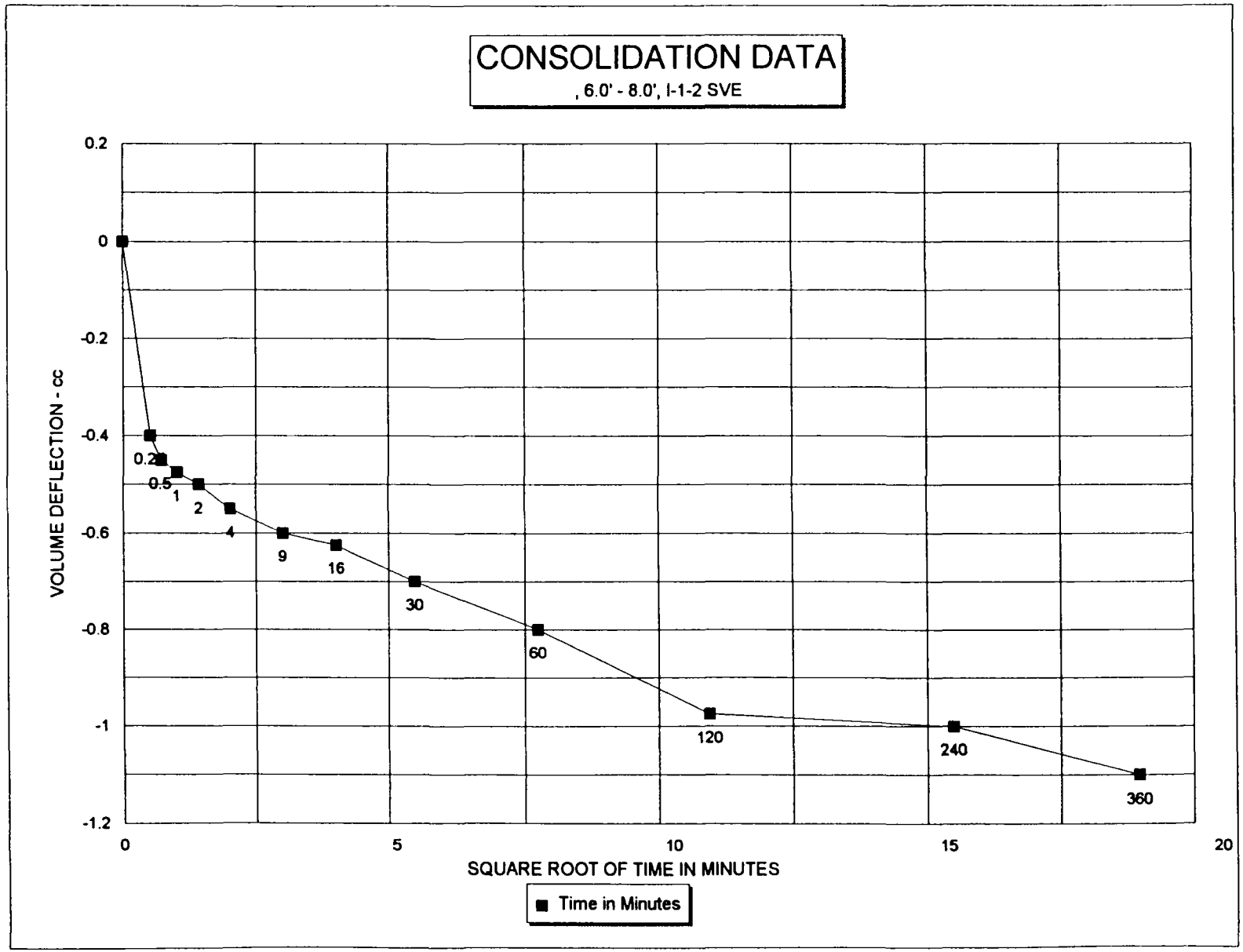
CONSOLIDATION DATA

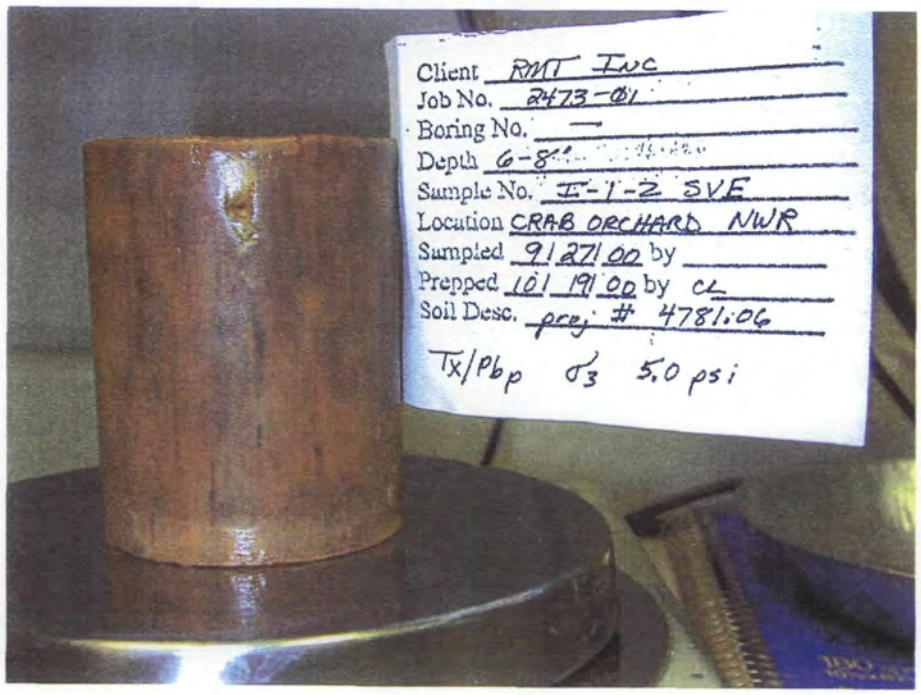
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	11.90	0.00
0.25	0.50	12.30	-0.40
0.5	0.71	12.35	-0.45
1	1.00	12.38	-0.48
2	1.41	12.40	-0.50
4	2.00	12.45	-0.55
9	3.00	12.50	-0.60
16	4.00	12.53	-0.63
30	5.48	12.60	-0.70
60	7.75	12.70	-0.80
120	10.95	12.88	-0.98
240	15.49	12.90	-1.00
360	18.97	13.00	-1.10

Initial Height (in)	3.097	Init. Vol. (CC)	229.82
Height Change (in)	0.012	Vol. Change (CC)	12.80
Ht. After Cons. (in)	3.085	Cell Exp. (CC)	9.13
Initial Area (sq in)	4.528	Net Change (CC)	3.67
Area After Cons. (sq in)	4.473	Cons. Vol. (CC)	226.15

Data entry by: MC Date: 10/24/2000
Checked by: CL Date: 10/24/00
FileName: RCP02SVE

ADVANCED TERRA TESTING, INC.


CONSOLIDATION DATA
, 6.0' - 8.0', I-1-2 SVE
VOLUME DEFLECTION - cc
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.2
0.5
1
2
4
9
16
30
60
120
240
360
Time in Minutes



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10/23/00

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	10/2/00
DEPTH	5.25' - 7.25'	TEST STARTED	10/19/00 CL
SAMPLE NO.	I-1-23-SVE	TEST FINISHED	10/23/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	4P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	720 5 psi	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	477.2	477.1
Wt. Wet Soil & Pan (g)	485.3	485.2
Wt. Dry Soil & Pan (g)	387.0	387.0
Wt. Lost Moisture (g)	98.2	98.1
Wt. of Pan Only (g)	8.1	8.1
Wt. of Dry Soil (g)	379.0	379.0
Moisture Content %	25.9	25.9
Wet Density PCF	123.9	126.1
Dry Density PCF	98.4	100.2

Init. Diameter (in)	2.405	(cm)	6.109
Init. Area (sq in)	4.543	(sq cm)	29.310
Init. Height (in)	3.230	(cm)	8.204
Vol. Bef. Consol. (cu ft)	0.00849		
Vol. After Consol. (cu ft)	0.00834		
Porosity %	41.54		

FLOW PUMP CALCULATIONS

Pump Setting	19
Velocity CM/Sec	1.25E-04
Q (cc/s)	3.99E-06
Height	3.211
Diameter	2.391
Pressure (psi)	1.280
Area after consol. (cm*cm)	28.956
Gradient	11.034
Permeability k (cm/s)	1.2E-08
Back Pressure (psi)	48.0
Cell Pressure (psi)	53.0
Ave. Effective Stress (psi)	4.360

Data entry by: MC Date: 10/24/2000
Checked by: cc Date: 10/24/00
FileName: RCP0ISVE

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc.	JOB NO.	2473-01
BORING NO.		SAMPLED	10/2/00
DEPTH	5.25' - 7.25'	TEST STARTED	10/19/00 CL
SAMPLE NO.	I-1-23-SVE	TEST FINISHED	10/23/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	4P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	720	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.7	9.9				
50.0	48.0	10.8	11.6	39.0	48.3	9.3	0.93
60.0		12.0	12.0	49.2	58.7	9.5	0.95

CONSOLIDATION DATA

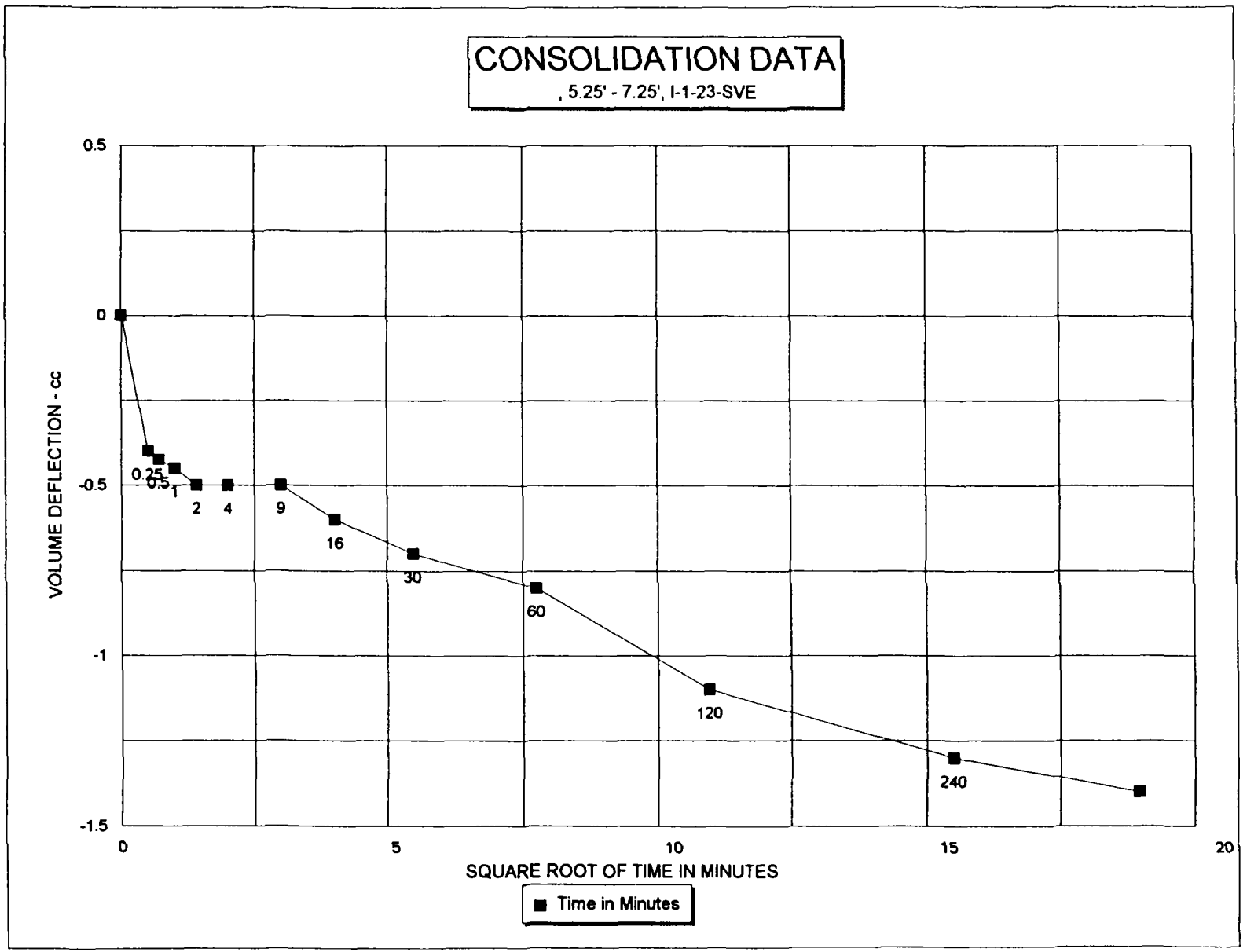
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	12.00	0.00
0.25	0.50	12.40	-0.40
0.5	0.71	12.43	-0.43
1	1.00	12.45	-0.45
2	1.41	12.50	-0.50
4	2.00	12.50	-0.50
9	3.00	12.50	-0.50
16	4.00	12.60	-0.60
30	5.48	12.70	-0.70
60	7.75	12.80	-0.80
120	10.95	13.10	-1.10
240	15.49	13.30	-1.30
360	18.97	13.40	-1.40

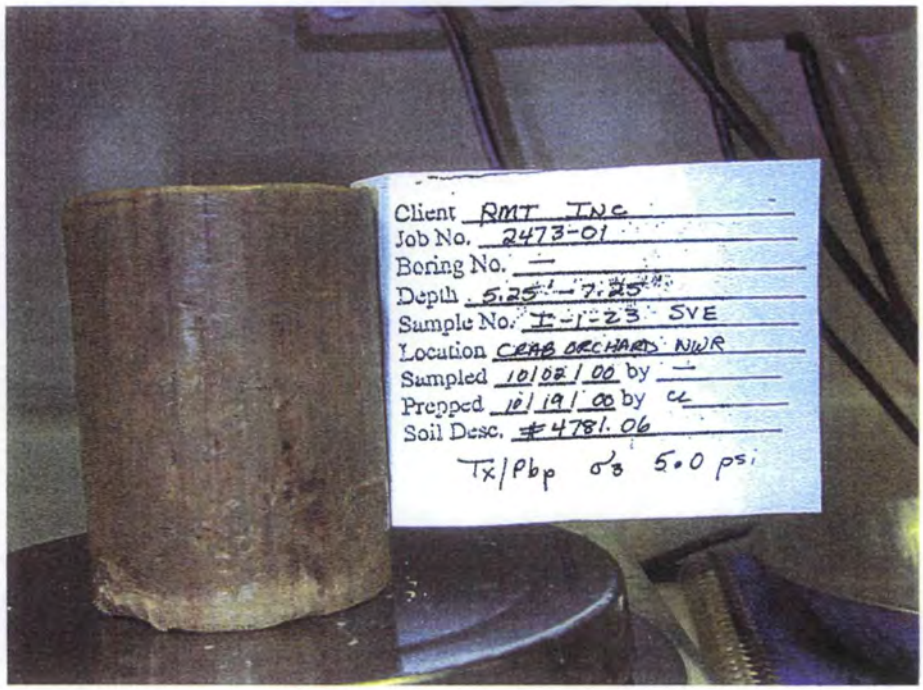
Initial Height (in)	3.230	Init. Vol. (CC)	240.49
Height Change (in)	0.019	Vol. Change (CC)	12.70
Ht. After Cons. (in)	3.211	Cell Exp. (CC)	8.42
Initial Area (sq in)	4.543	Net Change (CC)	4.28
Area After Cons. (sq in)	4.488	Cons. Vol. (CC)	236.21

Data entry by: MC Date: 10/24/2000
Checked by: CL Date: 10/24/00
FileName: RCP0ISVE

ADVANCED TERRA TESTING, INC.

90


CONSOLIDATION DATA
, 5.25' - 7.25', I-1-23-SVE
VOLUME DEFLECTION - cc
0.5
0
-0.5
-1
-1.5
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.5
1
2
4
9
16
30
60
120
240
Time in Minutes



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10/23/00

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc	JOB NO.	2473-01
BORING NO.	Repository	SAMPLED	9/28/00
DEPTH	30.5' - 32.5'	TEST STARTED	10/20/00 CL
SAMPLE NO.	MPE-US	TEST FINISHED	10/24/00 CL
SOIL DESCR.	Proj # 4781.06	CELL NUMBER	2P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600 25 p.s.i	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	493.7	494.6
Wt. Wet Soil & Pan (g)	502.3	503.1
Wt. Dry Soil & Pan (g)	420.0	420.0
Wt. Lost Moisture (g)	82.3	83.1
Wt. of Pan Only (g)	8.5	8.5
Wt. of Dry Soil (g)	411.5	411.5
Moisture Content %	20.0	20.2
Wet Density PCF	129.6	131.6
Dry Density PCF	108.0	109.5

Init. Diameter (in)	2.396	(cm)	6.086
Init. Area (sq in)	4.509	(sq cm)	29.091
Init. Height (in)	3.219	(cm)	8.176
Vol. Bef. Consol. (cu ft)	0.00840		
Vol. After Consol. (cu ft)	0.00828		
Porosity %	35.41		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	5
Percentage of Pump setting	100
Q (cc/s)	1.70E-03
Height	3.191
Diameter	2.390
Pressure (psi)	0.115
Area after consol. (cm*cm)	28.935
Gradient	0.998
Permeability k (cm/s)	5.9E-05
Back Pressure (psi)	48.0
Cell Pressure (psi)	73.0
Ave. Effective Stress (psi)	24.943

Data entry by: MC Date: 10/25/2000
Checked by: cu Date: 10/25/00
FileName: RMP0PEUS

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc	JOB NO.	2473-01
BORING NO.	Repository	SAMPLED	9/28/00
DEPTH	30.5' - 32.5'	TEST STARTED	10/20/00 CL
SAMPLE NO.	MPE-US	TEST FINISHED	10/24/00 CL
SOIL DESCR.	Proj # 4781.06	SETUP NO.	2P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.2	10.3				
50.0	48.0	11.6	12.7	39.6	48.9	9.3	0.93
60.0		13.4	13.5	49.1	58.9	9.8	0.98

CONSOLIDATION DATA

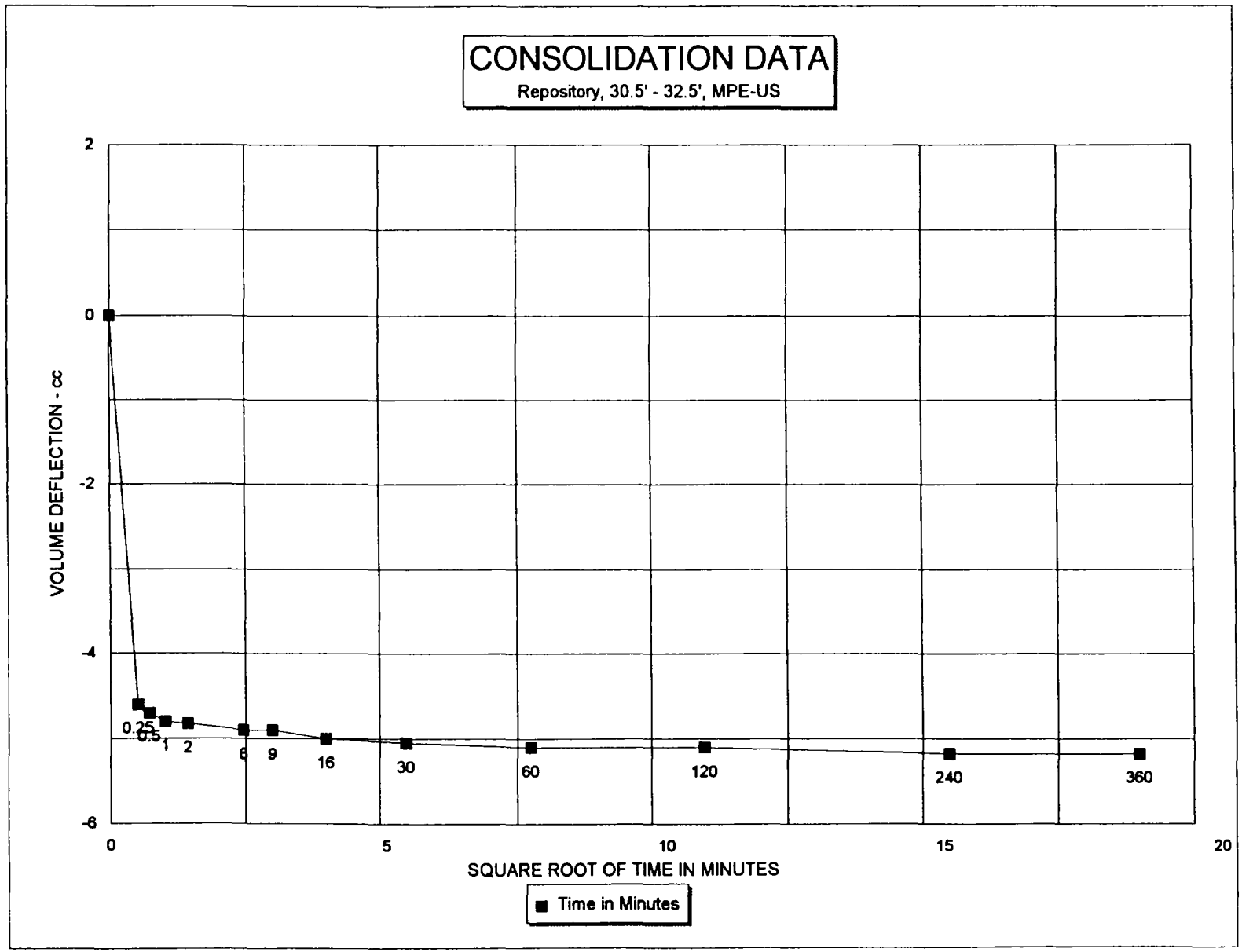
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.00	0.00
0.25	0.50	4.60	-4.60
0.5	0.71	4.70	-4.70
1	1.00	4.80	-4.80
2	1.41	4.83	-4.83
6	2.45	4.90	-4.90
9	3.00	4.90	-4.90
16	4.00	5.00	-5.00
30	5.48	5.05	-5.05
60	7.75	5.10	-5.10
120	10.95	5.10	-5.10
240	15.49	5.18	-5.18
360	18.97	5.18	-5.18

Initial Height (in)	3.219	Init. Vol. (CC)	237.88
Height Change (in)	0.028	Vol. Change (CC)	16.70
Ht. After Cons. (in)	3.191	Cell Exp. (CC)	13.38
Initial Area (sq in)	4.509	Net Change (CC)	3.32
Area After Cons. (sq in)	4.485	Cons. Vol. (CC)	234.56

Data entry by: MC Date: 10/25/2000
Checked by: CL Date: 10/25/00
FileName: RMP0PEUS

ADVANCED TERRA TESTING, INC.

CL


CONSOLIDATION DATA
Repository, 30.5' - 32.5', MPE-US
VOLUME DEFLECTION - cc
2
0
-2
-4
-6
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.5
1
2
6
9
16
30
60
120
240
360
Time in Minutes

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc.	JOB NO.	2473-01
BORING NO.	Repository	SAMPLED	9/29/00
DEPTH	45.0' - 47.5'	TEST STARTED	10/20/00 CL
SAMPLE NO.	MPE - UC2	TEST FINISHED	10/25/00 CL
SOIL DESCR.	Proj # 4781.06	CELL NUMBER	1P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600 25	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	506.7	500.9
Wt. Wet Soil & Pan (g)	516.0	510.2
Wt. Dry Soil & Pan (g)	427.4	427.4
Wt. Lost Moisture (g)	88.6	82.8
Wt. of Pan Only (g)	9.3	9.3
Wt. of Dry Soil (g)	418.1	418.1
Moisture Content %	21.2	19.8
Wet Density PCF	131.9	134.9
Dry Density PCF	108.9	112.6

Init. Diameter (in)	2.398	(cm)	6.091
Init. Area (sq in)	4.516	(sq cm)	29.140
Init. Height (in)	3.239	(cm)	8.227
Vol. Bef. Consol. (cu ft)	0.00847		
Vol. After Consol. (cu ft)	0.00819		
Porosity %	35.71		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	12
Percentage of Pump setting	100
Q (cc/s)	6.78E-06
Height	3.174
Diameter	2.382
Pressure (psi)	2.090
Area after consol. (cm*cm)	28.750
Gradient	18.227
Permeability k (cm/s)	1.3E-08
Back Pressure (psi)	58.0
Cell Pressure (psi)	83.0
Ave. Effective Stress (psi)	23.955

Data entry by: MC Date: 10/26/2000
Checked by: cu Date: 10/26/00
FileName: RCP0UCS2

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc.	JOB NO.	2473-01
BORING NO.	Repository	SAMPLED	9/29/00
DEPTH	45.0' - 47.5'	TEST STARTED	10/20/00 CL
SAMPLE NO.	MPE - UC2	TEST FINISHED	10/25/00 CL
SOIL DESCR.	Proj # 4781.06	SETUP NO.	1P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	0.8	7.2				
50.0	48.0	8.7	9.8	39.2	47.6	8.4	0.84
60.0	58.0	10.3	11.4	49.0	58.2	9.2	0.92
70.0		11.6	11.7	59.3	68.8	9.5	0.95

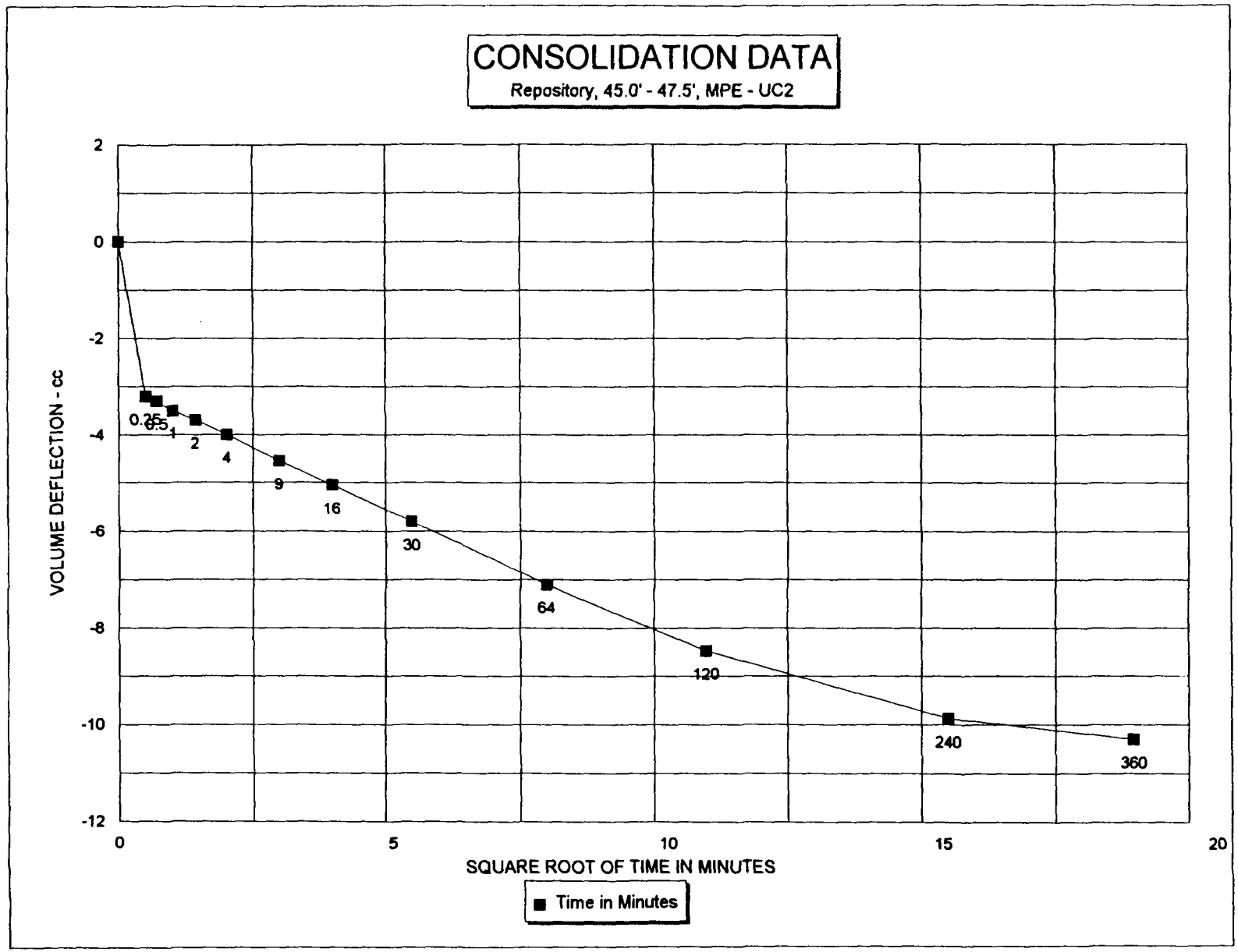
CONSOLIDATION DATA

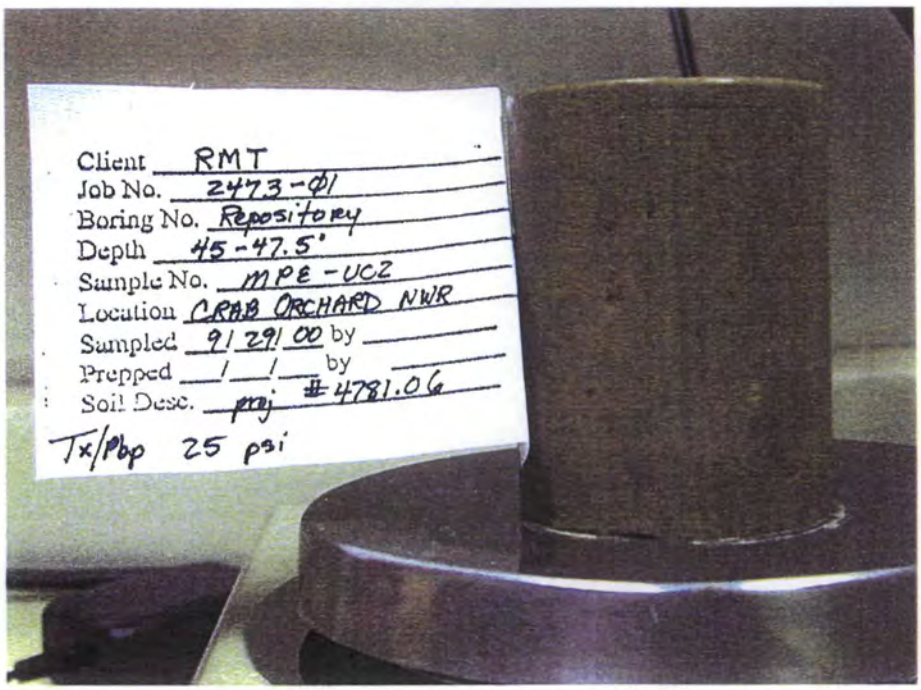
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.10	0.00
0.25	0.50	3.30	-3.20
0.5	0.71	3.40	-3.30
1	1.00	3.60	-3.50
2	1.41	3.80	-3.70
4	2.00	4.10	-4.00
9	3.00	4.65	-4.55
16	4.00	5.15	-5.05
30	5.48	5.90	-5.80
64	8.00	7.20	-7.10
120	10.95	8.57	-8.47
240	15.49	9.98	-9.88
360	18.97	10.40	-10.30

Initial Height (in)	3.239	Init. Vol. (CC)	239.76
Height Change (in)	0.065	Vol. Change (CC)	22.00
Ht. After Cons. (in)	3.174	Cell Exp. (CC)	14.06
Initial Area (sq in)	4.516	Net Change (CC)	7.94
Area After Cons. (sq in)	4.456	Cons. Vol. (CC)	231.82

Data entry by: MC Date: 10/26/2000
Checked by: CL Date: 10/26/00
FileName: RCP0UCS2

ADVANCED TERRA TESTING, INC.


CONSOLIDATION DATA
Repository, 45.0' - 47.5', MPE - UC2
VOLUME DEFLECTION - cc
2
0
-2
-4
-6
-8
-10
-12
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.5
1
2
4
9
16
30
64
120
240
360
Time in Minutes



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10/24/00

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT RMT, Inc. JOB NO. 2473-01

BORING NO.	Repository	SAMPLED	
DEPTH	39.0' - 40.5'	TEST STARTED	10/20/00 CL
SAMPLE NO.	MPE-UC1	TEST FINISHED	10/30/00 CL
SOIL DESCR.	Proj # 4781.06	CELL NUMBER	7P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	523.6	516.6
Wt. Wet Soil & Pan (g)	532.6	525.6
Wt. Dry Soil & Pan (g)	437.8	437.8
Wt. Lost Moisture (g)	94.8	87.8
Wt. of Pan Only (g)	9.0	9.0
Wt. of Dry Soil (g)	428.8	428.8
Moisture Content %	22.1	20.5
Wet Density PCF	130.8	133.6
Dry Density PCF	107.1	110.9

Init. Diameter (in)	2.399	(cm)	6.093
Init. Area (sq in)	4.520	(sq cm)	29.164
Init. Height (in)	3.374	(cm)	8.570
Vol. Bef. Consol. (cu ft)	0.00883		
Vol. After Consol. (cu ft)	0.00852		
Porosity %	36.39		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	12
Percentage of Pump setting	100
Q (cc/s)	6.78E-06
Height	3.311
Diameter	2.380
Pressure (psi)	0.958
Area after consol. (cm*cm)	28.696
Gradient	8.009
Permeability k (cm/s)	3.0E-08
Back Pressure (psi)	88.0
Cell Pressure (psi)	113.0
Ave. Effective Stress (psi)	24.521

Data entry by: MC Date: 11/01/2000
Checked by: SR Date: 11-1-00
FileName: RCP0MPE1

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT, Inc.	JOB NO.	2473-01
BORING NO.	Repository	SAMPLED	
DEPTH	39.0' - 40.5'	TEST STARTED	10/20/00 CL
SAMPLE NO.	MPE-UC1	TEST FINISHED	10/30/00 CL
SOIL DESCR.	Proj # 4781.06	SETUP NO.	7P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	2.0	10.8				
50.0	48.0	12.4	13.5	39.6	47.5	7.9	0.79
60.0	58.0	13.9	14.9	49.9	58.4	8.5	0.85
70.0	68.0	15.1	16.1	60.1	69.1	9.0	0.90
80.0	78.0	17.9	18.9	70.4	79.8	9.4	0.94
90.0	88.0	19.0	19.9	80.4	89.8	9.4	0.94
100.0		20.0	20.1	90.4	100.0	9.6	0.96

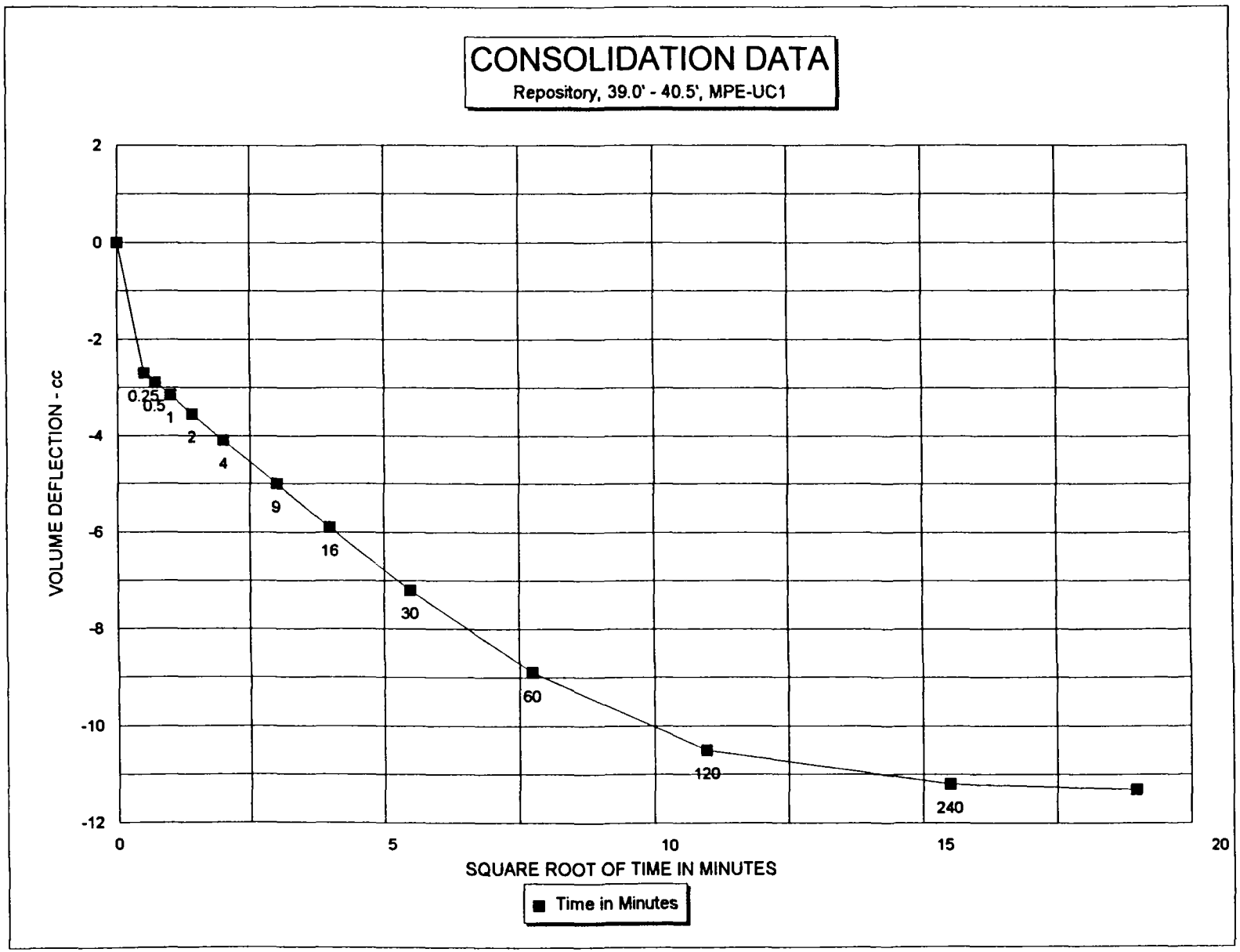
CONSOLIDATION DATA

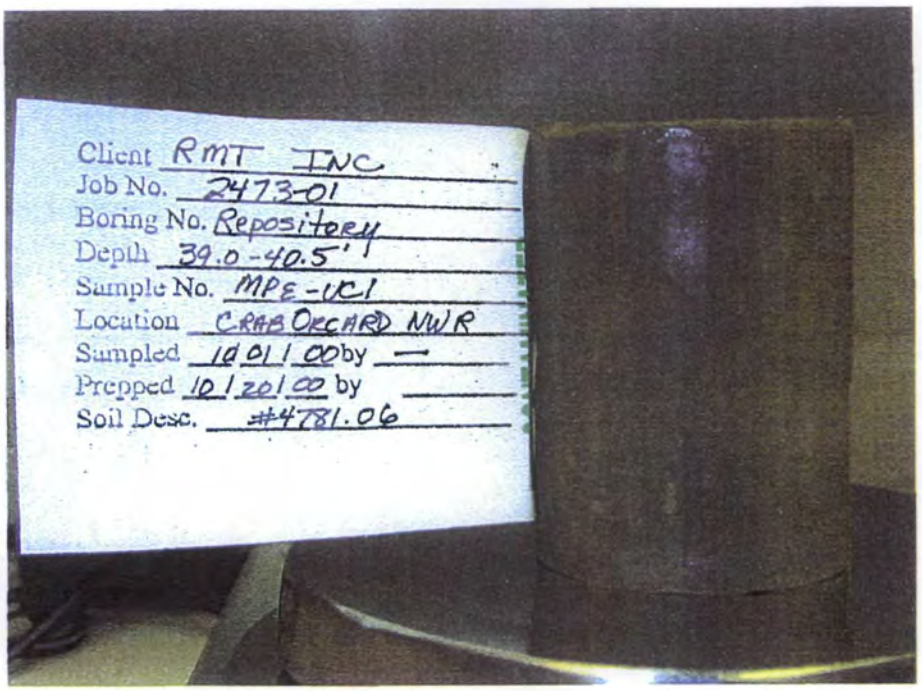
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	1.20	0.00
0.25	0.50	3.90	-2.70
0.5	0.71	4.10	-2.90
1	1.00	4.35	-3.15
2	1.41	4.75	-3.55
4	2.00	5.30	-4.10
9	3.00	6.20	-5.00
16	4.00	7.10	-5.90
30	5.48	8.40	-7.20
60	7.75	10.10	-8.90
120	10.95	11.70	-10.50
240	15.49	12.40	-11.20
360	18.97	12.50	-11.30

Initial Height (in)	3.374	Init. Vol. (CC)	249.96
Height Change (in)	0.063	Vol. Change (CC)	30.00
Ht. After Cons. (in)	3.311	Cell Exp. (CC)	21.41
Initial Area (sq in)	4.520	Net Change (CC)	8.59
Area After Cons. (sq in)	4.448	Cons. Vol. (CC)	241.38

Data entry by: MC Date: 11/01/2000
Checked by: SR Date: 11-1-00
FileName: RCP0MPE1

ADVANCED TERRA TESTING, INC.


CONSOLIDATION DATA
Repository, 39.0' - 40.5', MPE-UC1
VOLUME DEFLECTION - cc
2
0
-2
-4
-6
-8
-10
-12
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.5
1
2
4
9
16
30
60
120
240
Time in Minutes



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10/30/00

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc	JOB NO.	2473-01
BORING NO.		SAMPLED	10/2/00
DEPTH	14.0' - 16.0'	TEST STARTED	10/20/00 CL
SAMPLE NO.	I-1-23UC	TEST FINISHED	10/28/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	8P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	1440	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	482.0	486.4
Wt. Wet Soil & Pan (g)	490.5	494.9
Wt. Dry Soil & Pan (g)	403.9	403.9
Wt. Lost Moisture (g)	86.6	91.0
Wt. of Pan Only (g)	8.5	8.5
Wt. of Dry Soil (g)	395.5	395.5
Moisture Content %	21.9	23.0
Wet Density PCF	129.0	131.2
Dry Density PCF	105.8	106.7

Init. Diameter (in)	2.416	(cm)	6.137
Init. Area (sq in)	4.584	(sq cm)	29.579
Init. Height (in)	3.105	(cm)	7.887
Vol. Bef. Consol. (cu ft)	0.00824		
Vol. After Consol. (cu ft)	0.00817		
Porosity %	39.30		

FLOW PUMP CALCULATIONS

Pump Setting (gear number)	12
Percentage of Pump setting	100
Q (cc/s)	6.78E-06
Height	3.081
Diameter	2.416
Pressure (psi)	2.320
Area after consol. (cm*cm)	29.570
Gradient	20.843
Permeability k (cm/s)	1.1E-08
Back Pressure (psi)	88.0
Cell Pressure (psi)	98.0
Ave. Effective Stress (psi)	8.840

Data entry by: MC Date: 11/01/2000
Checked by: ac Date: 11/02/00
FileName: RCP032UC

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc	JOB NO.	2473-01
BORING NO.		SAMPLED	10/2/00
DEPTH	14.0' - 16.0'	TEST STARTED	10/20/00 CL
SAMPLE NO.	I-1-23UC	TEST FINISHED	10/28/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	8P
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	1440	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.7	9.8				
50.0	48.0	8.4	9.4	39.8	47.4	7.6	0.76
60.0	58.0	9.8	10.7	49.8	58.5	8.7	0.87
70.0	68.0	10.7	11.6	60.0	68.8	8.8	0.88
80.0	78.0	11.7	12.6	70.2	79.1	8.9	0.89
90.0	88.0	13.5	14.3	80.2	89.4	9.2	0.92
100.0		14.5	14.6	90.1	99.8	9.7	0.97

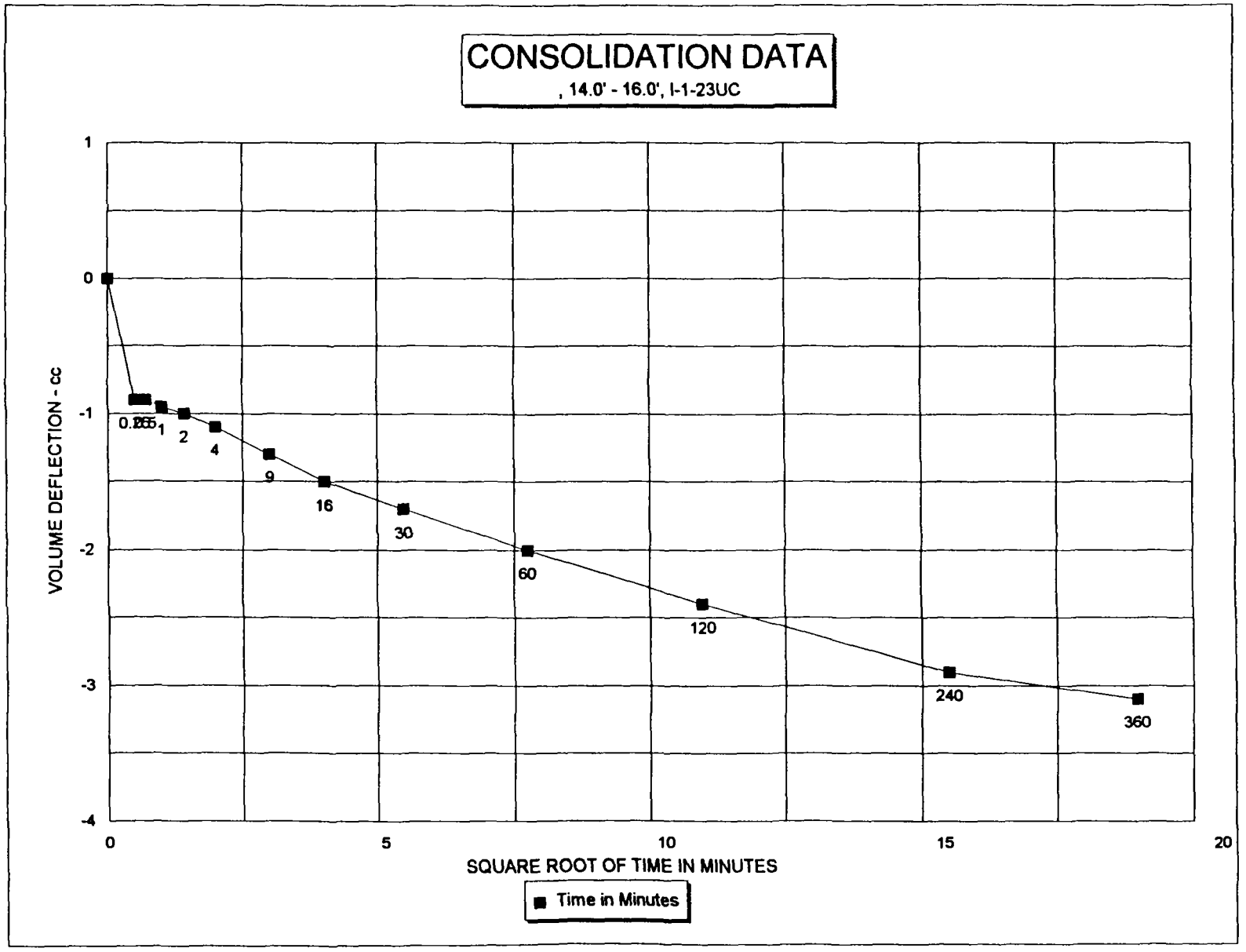
CONSOLIDATION DATA

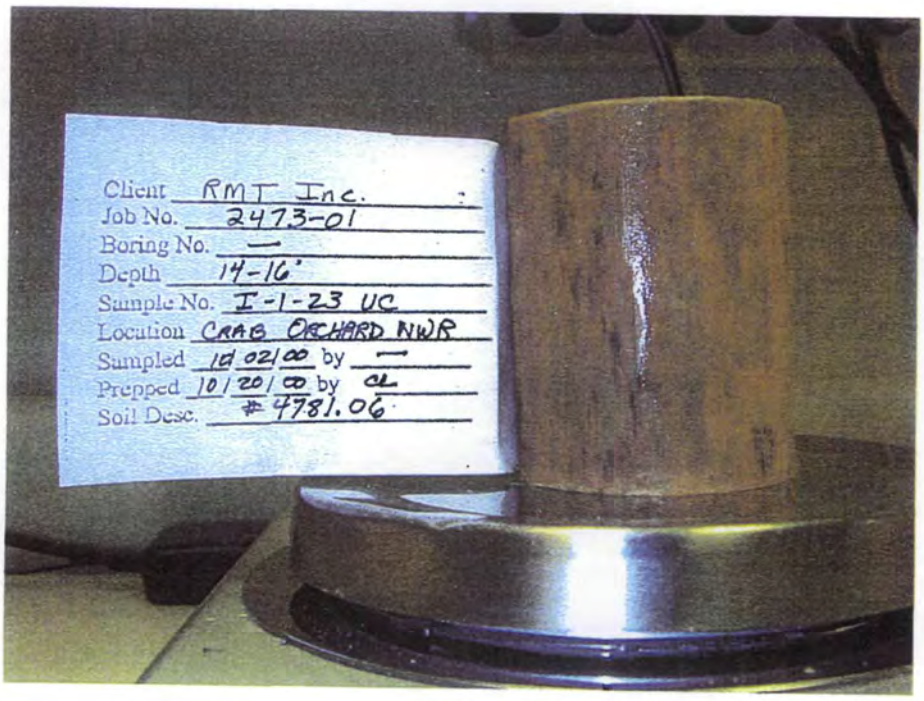
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	0.80	0.00
0.25	0.50	1.70	-0.90
0.5	0.71	1.70	-0.90
1	1.00	1.75	-0.95
2	1.41	1.80	-1.00
4	2.00	1.90	-1.10
9	3.00	2.10	-1.30
16	4.00	2.30	-1.50
30	5.48	2.50	-1.70
60	7.75	2.80	-2.00
120	10.95	3.20	-2.40
240	15.49	3.70	-2.90
360	18.97	3.90	-3.10

Initial Height (in)	3.105	Init. Vol. (CC)	233.31
Height Change (in)	0.024	Vol. Change (CC)	17.10
Ht. After Cons. (in)	3.081	Cell Exp. (CC)	15.24
Initial Area (sq in)	4.584	Net Change (CC)	1.86
Area After Cons. (sq in)	4.583	Cons. Vol. (CC)	231.45

Data entry by: MC Date: 11/01/2000
Checked by: cc Date: 11/02/00
FileName: RCP032UC

ADVANCED TERRA TESTING, INC.


CONSOLIDATION DATA
, 14.0' - 16.0', I-1-23UC
VOLUME DEFLECTION - cc
1
0
-1
-2
-3
-4
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.25
1
2
4
9
16
30
60
120
240
360
Time in Minutes



J:\RC2473\RCDP23UC.JPG
10/30/00

% CARBON SUMMARY

% Carbon Summary

Client: RMT, Inc.
Location: Crab Orchard NWR, #4781.06

Job Number: 2473-02
Date Tested: 10/24/00

Sample ID	Depth	% Carbon	% Carbonate as C	% Organic Carbon
33 MWC-45 X	--------	0.92	0.737	0.18
33 MWC-47 R	34.0' - 36.5'	2.34	1.580	0.76
33 MWC-43 F	10.0' - 12.5'	0.11	0.016	0.10
33 MWC-49 J	18.0' - 20.5'	0.09	0.009	0.08
33 MWC-43 N	26.0' - 28.5'	2.33	1.890	0.44
33 MWC-45	10.0' - 12.5'	0.15	0.016	0.14
33 MWC-47 G	12.0' - 14.5'	0.12	0.006	0.12
33 MWC-49 R	34.0' - 36.5'	2.34	1.600	0.74

All results are reported on the dry basis

ADVANCED TERRA TESTING, inc

Data entry by: MC
Checked by: SR
FileName: RCZ033M2

Date: 11/16/2000
Date: 11-20-00

HYDROMETER ANALYSIS
With Mechanical Grain Size Analysis
ASTM D 422

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT RMT, Inc.

JOB NO. 2473-02

BORING NO.	33 MWC-43	SAMPLED	
DEPTH	10.0' - 12.5'	DATE TESTED	11/30/00 M
SAMPLE NO.	F	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes	
NATURAL	No	
Wt. Wet Soil & Pan (g)		84.67
Wt. Dry Soil & Pan (g)		83.18
Wt. Lost Moisture (g)		1.49
Wt. of Pan Only (g)		3.58
Wt. of Dry Soil (g)		79.60
Moisture Content %		1.9
Wt. Hydrom. Sample Wet (g)		57.41
Wt. Hydrom. Sample Dry (g)		56.35

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	474.20
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	474.20
Weight of - #10 Dry (g)	465.49
Wt. Total Sample Dry (g)	465.49
Calc. Wt. "W" (g)	56.35
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	2.35	2.51	0.16	0.16	0.3	99.7
#40	2.37	2.92	0.55	0.71	1.3	98.7
#60	2.39	5.79	3.40	4.11	7.3	92.7
#100	2.35	7.66	5.31	9.42	16.7	83.3
#200	2.32	6.95	4.63	14.05	24.9	75.1

Data entered by: MC Date: 12/05/2000
Data checked by: KR Date: 12/10/2000
FileName: RCH03343

ADVANCED TERRA TESTING, INC

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33 MWC-43	SAMPLED	
DEPTH	10.0' - 12.5'	DATE TESTED	11/30/00 M
SAMPLE NO.	F	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

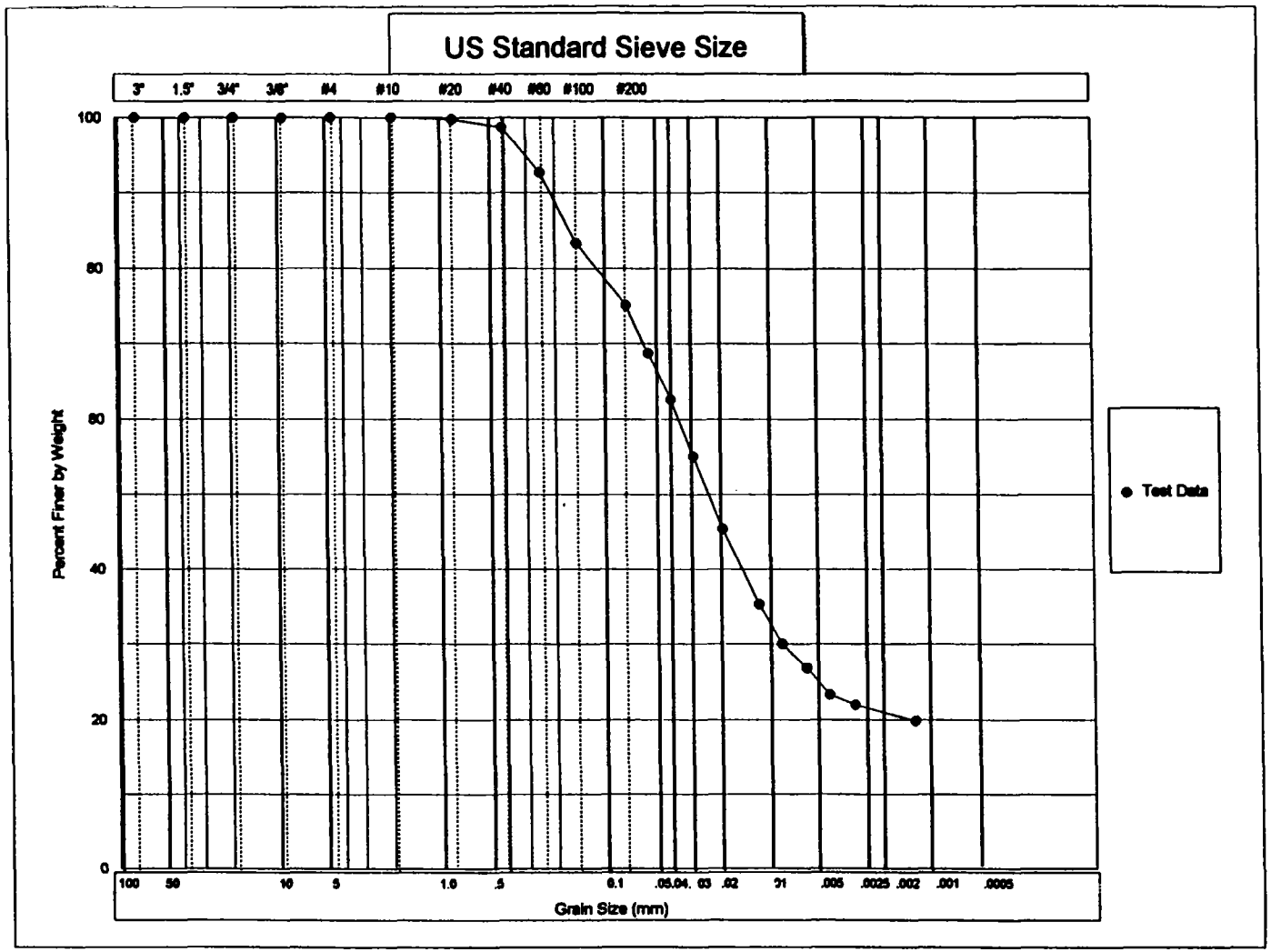
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.2
Sp. Gr. of Soil	2.68	Temp. Coef. K	0.01302
Value of "alpha"	0.99	Wt. Dry Sample "W"	56.353
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.5		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	–	–	–	–	–	–
0.5	44.50	39.00	68.8	68.8	8.99	0.0552
1.0	41.00	35.50	62.6	62.6	9.57	0.0403
2.0	36.75	31.25	55.1	55.1	10.26	0.0295
5.0	31.25	25.75	45.4	45.4	11.17	0.0195
15.0	25.50	20.00	35.3	35.3	12.11	0.0117
30.0	22.50	17.00	30.0	30.0	12.60	0.0084
60.0	20.75	15.25	26.9	26.9	12.89	0.0060
120.0	18.75	13.25	23.4	23.4	13.22	0.0043
250.0	18.00	12.50	22.0	22.0	13.34	0.0030
1440.0	16.75	11.25	19.8	19.8	13.54	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/05/2000
Data checked by: KR Date: 12/11/2000
FileName: RCH03343

ADVANCED TERRA TESTING, INC



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc.
Depth: 10.0' - 12.5'
Classification:

Boring No.: 33 MWC-43
Job Number: 2473-02

Sample No.: F

Advanced Terra Testing, Inc.

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MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33 MWC-43	SAMPLED	
DEPTH	28.0' - 28.5'	DATE TESTED	11/30/00 M
SAMPLE NO.	N	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	93.28
Wt. Dry Soil & Pan (g)	91.68
Wt. Lost Moisture (g)	1.60
Wt. of Pan Only (g)	3.65
Wt. of Dry Soil (g)	88.03
Moisture Content %	1.8
Wt. Hydrom. Sample Wet (g)	60.32
Wt. Hydrom. Sample Dry (g)	59.24

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	196.97
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	196.97
Weight of - #10 Dry (g)	195.42
Wt. Total Sample Dry (g)	195.42
Calc. Wt. "W" (g)	59.24
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	2.31	2.61	0.30	0.30	0.5	99.5
#40	2.30	2.81	0.51	0.81	1.4	98.6
#60	2.40	3.61	1.21	2.02	3.4	96.6
#100	2.35	5.03	2.68	4.70	7.9	92.1
#200	2.36	5.29	2.93	7.63	12.9	87.1

Data entered by: MC Date: 12/05/2000
Data checked by: KR Date: 12/8/2000
FileName: RCH02843

ADVANCED TERRA TESTING, INC

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33 MWC-43	SAMPLED	
DEPTH	26.0' - 28.5'	DATE TESTED	11/30/00 M
SAMPLE NO.	N	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

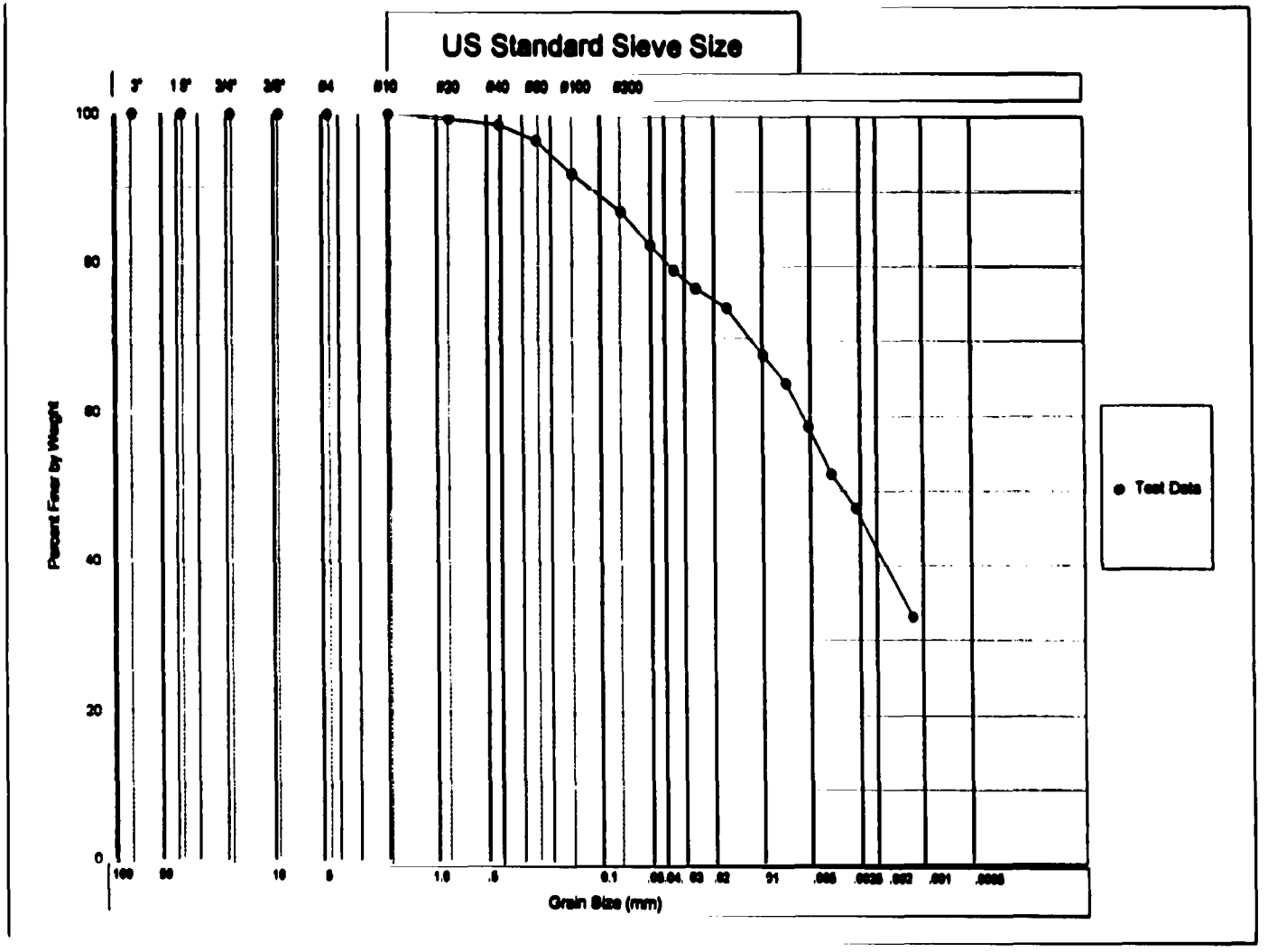
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.2
Sp. Gr. of Soil	2.71	Temp. Coef. K	0.01290
Value of "alpha"	0.99	Wt. Dry Sample "W"	59.243
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.5		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	–	–	–	–	–	–
0.5	55.00	49.50	82.6	82.6	7.27	0.0492
1.0	53.00	47.50	79.2	79.2	7.60	0.0356
2.0	51.50	46.00	76.7	76.7	7.84	0.0256
5.0	50.00	44.50	74.2	74.2	8.09	0.0164
15.0	46.25	40.75	68.0	68.0	8.71	0.0098
30.0	44.00	38.50	64.2	64.2	9.07	0.0071
60.0	40.50	35.00	58.4	58.4	9.65	0.0052
120.0	36.75	31.25	52.1	52.1	10.26	0.0038
250.0	34.00	28.50	47.5	47.5	10.71	0.0027
1441.0	25.25	19.75	32.9	32.9	12.15	0.0012

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/05/2000
Data checked by: KP Date: 12/10/2000
FileName: RCH02643

ADVANCED TERRA TESTING, INC



COBBLES	GRAVEL		SAND			SILT OR CLAY	USCS
	COARSE	FINE	CRS	MEDIUM	FINE		

COBBLES TO BOULDERS	PEBBLE GRAVEL			SAND			SILT	CLAY	WENTWORTH
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

Client: RMT, Inc.
Depth: 26.0' - 26.5'
Classification:

Boring No.: 33 MWC-43
Job Number: 2473-02

Sample No.: N

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33 MWC - 45	SAMPLED	
DEPTH		DATE TESTED	11/30/00 MC
SAMPLE NO.	X	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	82.35
Wt. Dry Soil & Pan (g)	81.42
Wt. Lost Moisture (g)	0.93
Wt. of Pan Only (g)	3.63
Wt. of Dry Soil (g)	77.79
Moisture Content %	1.2
Wt. Hydrom. Sample Wet (g)	57.86
Wt. Hydrom. Sample Dry (g)	57.18

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	520.12
Weight of + #10 Before Washing (g)	10.95
Weight of + #10 After Washing (g)	6.66
Weight of - #10 Wet (g)	509.17
Weight of - #10 Dry (g)	507.39
Wt. Total Sample Dry (g)	514.05
Calc. Wt. "W" (g)	57.93
Calc. Mass + #10	0.75

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.97	0.97	0.97	0.2	99.8
#10	0.00	5.69	5.69	6.66	1.3	98.7
#20	3.66	4.36	0.70	0.70	2.5	97.5
#40	3.53	4.63	1.10	1.80	4.4	95.6
#60	3.67	6.10	2.43	4.23	8.6	91.4
#100	3.72	7.29	3.57	7.80	14.8	85.2
#200	3.92	8.54	4.62	12.42	22.7	77.3

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH03345

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33 MWC - 45	SAMPLED	
DEPTH		DATE TESTED	11/30/00 MC
SAMPLE NO.	X	WASH SIEVE	Yes
SOIL DESCR.	Proj # 4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

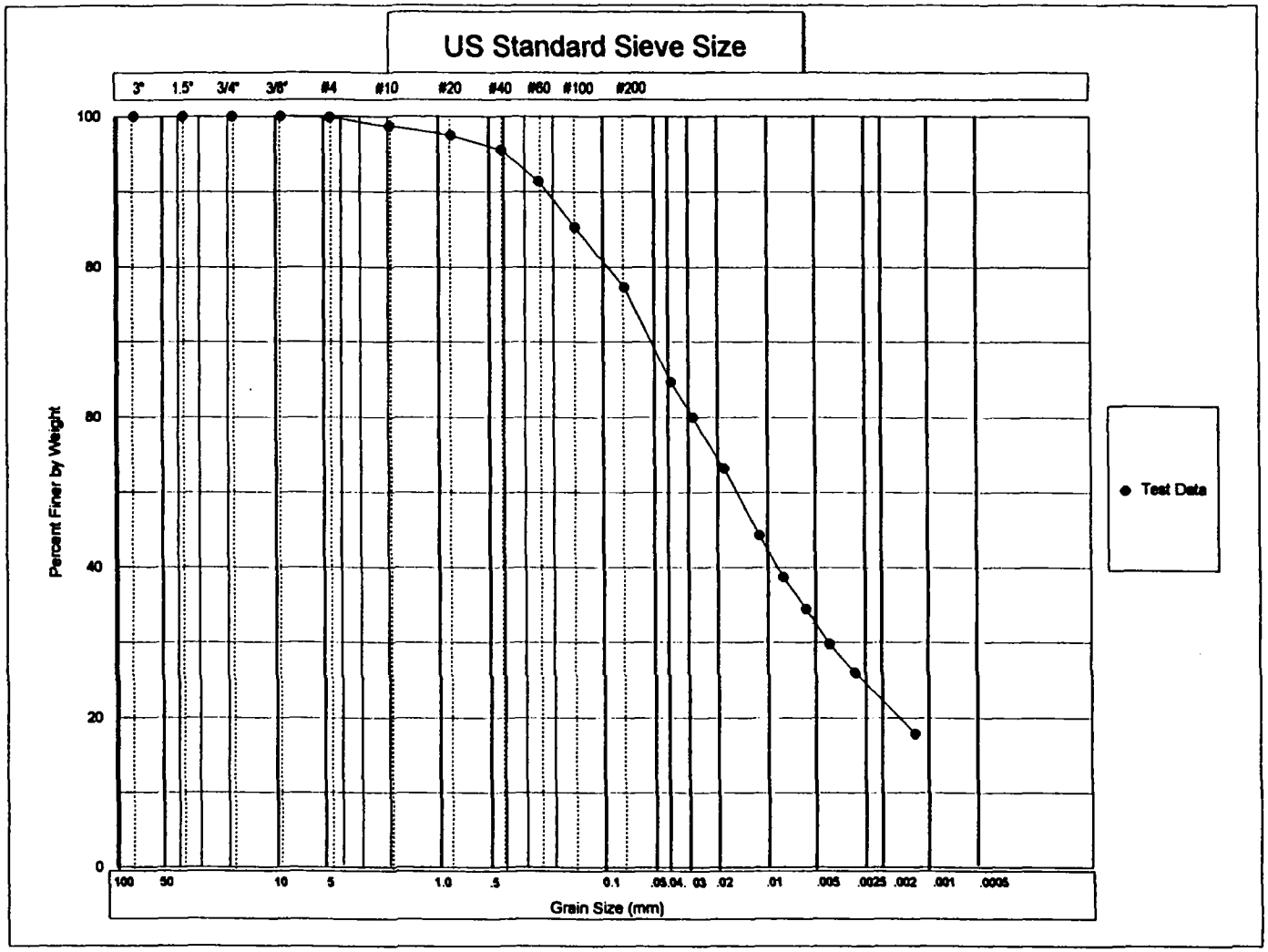
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.3
Sp. Gr. of Soil	2.72	Temp. Coef. K	0.01285
Value of "alpha"	0.99	Wt. Dry Sample "W"	57.930
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.5		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
1.0	43.50	38.00	64.7	64.7	9.16	0.0389
2.0	40.75	35.25	60.0	60.0	9.61	0.0282
5.0	36.75	31.25	53.2	53.2	10.26	0.0184
15.0	31.50	26.00	44.3	44.3	11.12	0.0111
30.0	28.25	22.75	38.7	38.7	11.66	0.0080
60.0	25.75	20.25	34.5	34.5	12.07	0.0058
120.0	23.00	17.50	29.8	29.8	12.52	0.0042
250.0	20.75	15.25	26.0	26.0	12.89	0.0029
1440.0	16.00	10.50	17.9	17.9	13.67	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/12/2000
Data checked by: SR Date: 12-12-00
FileName: RCH03345

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc.
Depth:
Classification:_____

Boring No.: 33 MWC - 45
Job Number: 2473-02

Sample No.: X

Advanced Terra Testing, Inc.

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MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC-45	SAMPLED	
DEPTH	10.0' - 12.5'	DATE TESTED	11/14/00 MC
SAMPLE NO.		WASH SIEVE	Yes
SOIL DESCR.	#4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	43.16
Wt. Dry Soil & Pan (g)	42.39
Wt. Lost Moisture (g)	0.77
Wt. of Pan Only (g)	3.68
Wt. of Dry Soil (g)	38.71
Moisture Content %	2.0
Wt. Hydrom. Sample Wet (g)	56.37
Wt. Hydrom. Sample Dry (g)	55.27

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	464.06
Weight of + #10 Before Washing (g)	4.12
Weight of + #10 After Washing (g)	1.19
Weight of - #10 Wet (g)	459.94
Weight of - #10 Dry (g)	453.84
Wt. Total Sample Dry (g)	455.03
Calc. Wt. "W" (g)	55.42
Calc. Mass + #10	0.14

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	1.19	1.19	1.19	0.3	99.7
#20	2.56	3.80	1.24	1.24	2.5	97.5
#40	3.55	4.17	0.62	1.86	3.6	96.4
#60	2.71	5.55	2.84	4.70	8.7	91.3
#100	3.68	6.70	3.02	7.72	14.2	85.8
#200	3.67	6.33	2.66	10.38	19.0	81.0

Data entered by: MC Date: 11/21/2000
Data checked by: SR Date: 11-22-00
FileName: RCM03345

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC-45	SAMPLED	
DEPTH	10.0' - 12.5'	DATE TESTED	11/14/00 MC
SAMPLE NO.		WASH SIEVE	Yes
SOIL DESCR.	#4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

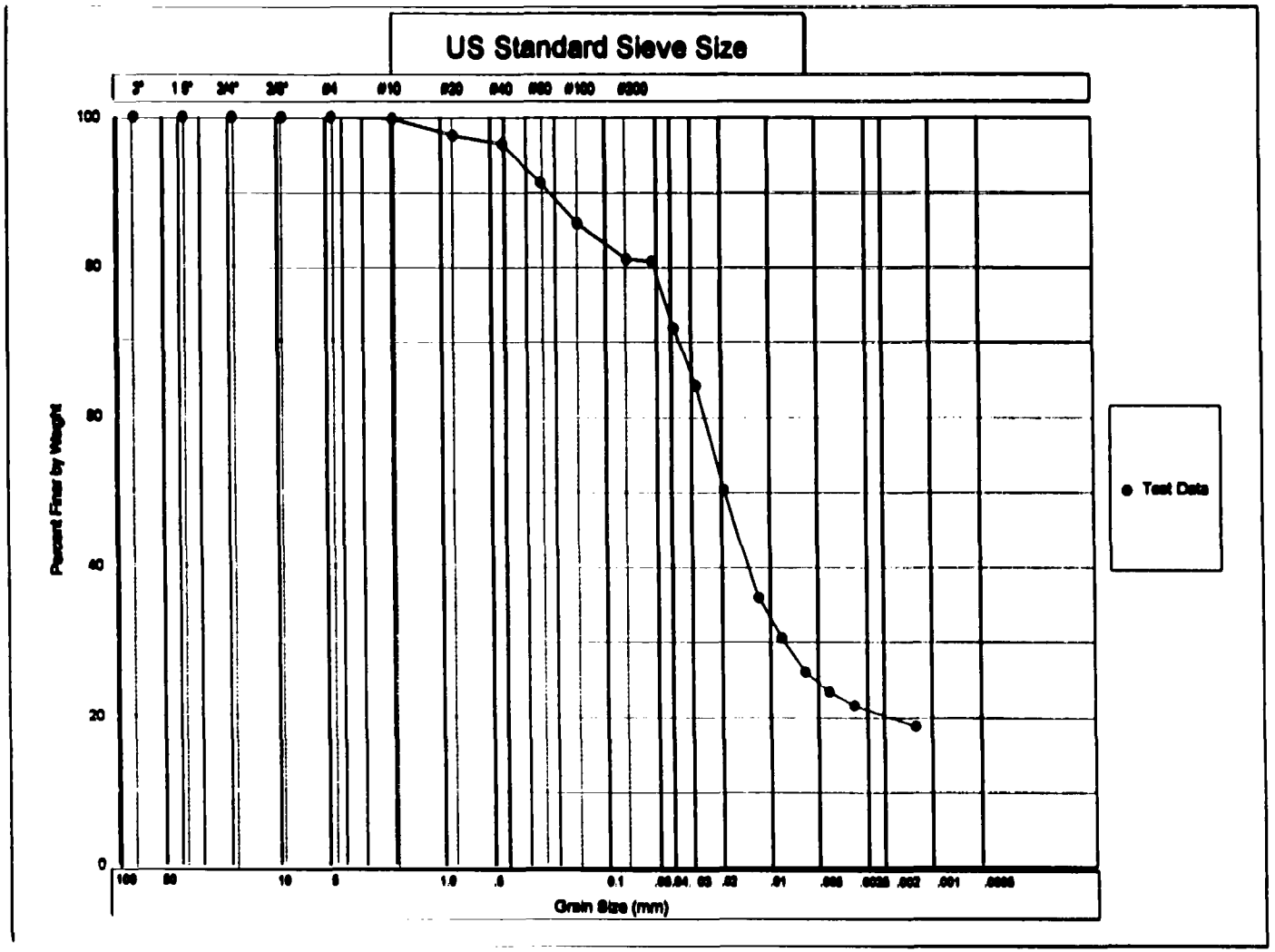
Hydrometer #	ASTM 152 H	Temp., Deg. C	22.8
Sp. Gr. of Soil	2.68	Temp. Coef. K	0.01308
Value of "alpha"	0.99	Wt. Dry Sample "W"	55.416
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	–	–	–	–	–	–
0.5	51.00	45.00	80.7	80.7	7.93	0.0521
1.0	46.00	40.00	71.7	71.7	8.75	0.0387
2.0	41.75	35.75	64.1	64.1	9.44	0.0284
5.0	34.00	28.00	50.2	50.2	10.71	0.0191
15.0	26.00	20.00	35.9	35.9	12.03	0.0117
30.0	23.00	17.00	30.5	30.5	12.52	0.0084
60.0	20.50	14.50	26.0	26.0	12.93	0.0061
120.0	19.00	13.00	23.3	23.3	13.17	0.0043
250.0	18.00	12.00	21.5	21.5	13.34	0.0030
1441.0	16.50	10.50	18.8	18.8	13.58	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 11/21/2000
Data checked by: SR Date: 11-22-00
FileName: RCM03345

ADVANCED TERRA TESTING, INC. 131



COBBLES	GRAVEL		SAND			SILT OR CLAY			USCS
	COARSE	FINE	CRS	MEDIUM	FINE				
COBBLES TO BOULDERS	PEBBLE GRAVEL			SAND			SILT	CLAY	WENTWORTH
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

Client: RMT, Inc.
Depth: 10.0' - 12.5'
Classification: _____

Boring No.: 33MWC-45
Job Number: 2473-02

Sample No.:

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC-47	SAMPLED	
DEPTH	12.0' - 14.5'	DATE TESTED	11/14/00 MC
SAMPLE NO.	G	WASH SIEVE	Yes
SOIL DESCR.	#4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	79.33
Wt. Dry Soil & Pan (g)	77.39
Wt. Lost Moisture (g)	1.94
Wt. of Pan Only (g)	4.05
Wt. of Dry Soil (g)	73.34
Moisture Content %	2.6
Wt. Hydrom. Sample Wet (g)	56.90
Wt. Hydrom. Sample Dry (g)	55.43

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	338.05
Weight of + #10 Before Washing (g)	1.53
Weight of + #10 After Washing (g)	0.34
Weight of - #10 Wet (g)	336.52
Weight of - #10 Dry (g)	329.01
Wt. Total Sample Dry (g)	329.35
Calc. Wt. "W" (g)	55.49
Calc. Mass + #10	0.06

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.34	0.34	0.34	0.1	99.9
#20	3.72	4.11	0.39	0.39	0.8	99.2
#40	3.86	4.41	0.55	0.94	1.8	98.2
#60	3.71	4.91	1.20	2.14	4.0	96.0
#100	3.70	5.48	1.78	3.92	7.2	92.8
#200	3.60	5.52	1.92	5.84	10.6	89.4

Data entered by: MC Date: 11/21/2000
Data checked by: SR Date: 11-21-00
FileName: RCM047G

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC-47	SAMPLED	
DEPTH	12.0' - 14.5'	DATE TESTED	11/14/00 MC
SAMPLE NO.	G	WASH SIEVE	Yes
SOIL DESCR.	#4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

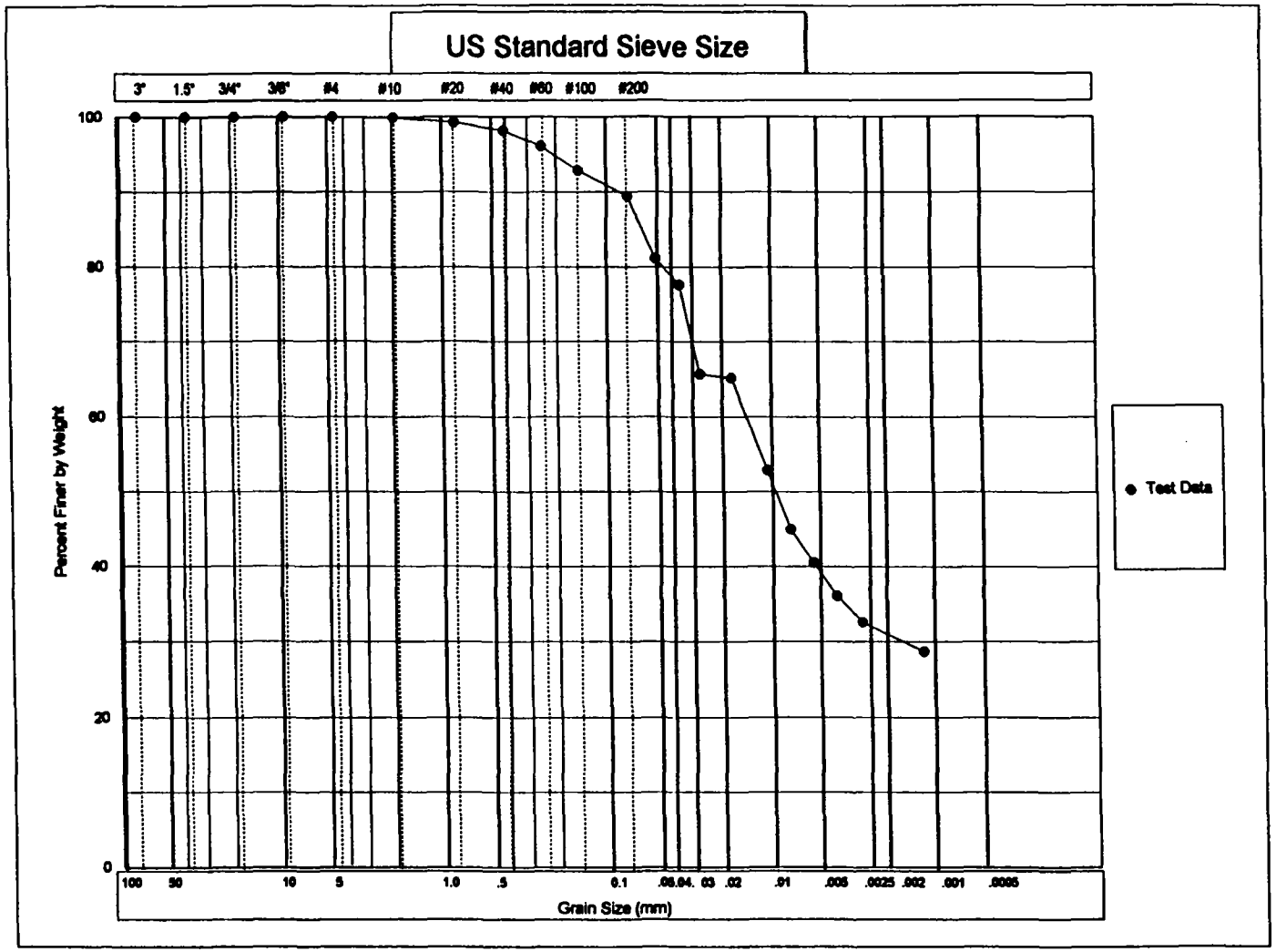
Hydrometer #	ASTM 152 H	Temp., Deg. C	22.8
Sp. Gr. of Soil	2.76	Temp. Coef. K	0.01278
Value of "alpha"	0.98	Wt. Dry Sample "W"	55.491
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	–	–	–	–	–	–
0.5	52.00	46.00	81.1	81.1	7.76	0.0504
1.0	50.00	44.00	77.5	77.5	8.09	0.0364
2.0	43.25	37.25	65.7	65.7	9.20	0.0274
5.0	43.00	37.00	65.2	65.2	9.24	0.0174
15.0	36.00	30.00	52.9	52.9	10.39	0.0108
30.0	31.50	25.50	44.9	44.9	11.12	0.0078
60.0	29.00	23.00	40.5	40.5	11.53	0.0056
120.0	26.50	20.50	36.1	36.1	11.94	0.0040
250.0	24.50	18.50	32.6	32.6	12.27	0.0028
1442.0	22.25	16.25	28.6	28.6	12.64	0.0012

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 11/21/2000
Data checked by:_____ Date:_____
FileName: RCM047G

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL			SAND			SILT	CLAY
	COARSE	MED	FINE	GRAN COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc.
Depth: 12.0' - 14.5'
Classification:_____

Boring No.: 33MWC-47
Job Number: 2473-02

Sample No.: G

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT RMT, Inc.

JOB NO. 2473-02

BORING NO.	33MWC-47	SAMPLED	
DEPTH	34.0' - 36.5'	DATE TESTED	11/14/00 MC
SAMPLE NO.	R	WASH SIEVE	Yes
SOIL DESCR.	#4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	59.99
Wt. Dry Soil & Pan (g)	59.41
Wt. Lost Moisture (g)	0.58
Wt. of Pan Only (g)	4.11
Wt. of Dry Soil (g)	55.30
Moisture Content %	1.0

Wt. Hydrom. Sample Wet (g)	58.35
Wt. Hydrom. Sample Dry (g)	57.75

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	367.49
Weight of + #10 Before Washing (g)	4.23
Weight of + #10 After Washing (g)	2.22
Weight of - #10 Wet (g)	363.26
Weight of - #10 Dry (g)	361.48
Wt. Total Sample Dry (g)	363.70
Calc. Wt. "W" (g)	58.10
Calc. Mass + #10	0.35

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	2.22	2.22	2.22	0.6	99.4
#20	3.71	4.16	0.45	0.45	1.4	98.6
#40	3.72	4.51	0.79	1.24	2.7	97.3
#60	3.62	5.35	1.73	2.97	5.7	94.3
#100	3.57	6.51	2.94	5.91	10.8	89.2
#200	3.55	7.65	4.10	10.01	17.8	82.2

Data entered by: MC Date: 11/21/2000
Data checked by: SR Date: 11-21-00
FileName: RCM047R

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC-47	SAMPLED	
DEPTH	34.0' - 36.5'	DATE TESTED	11/14/00 MC
SAMPLE NO.	R	WASH SIEVE	Yes
SOIL DESCR.	#4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

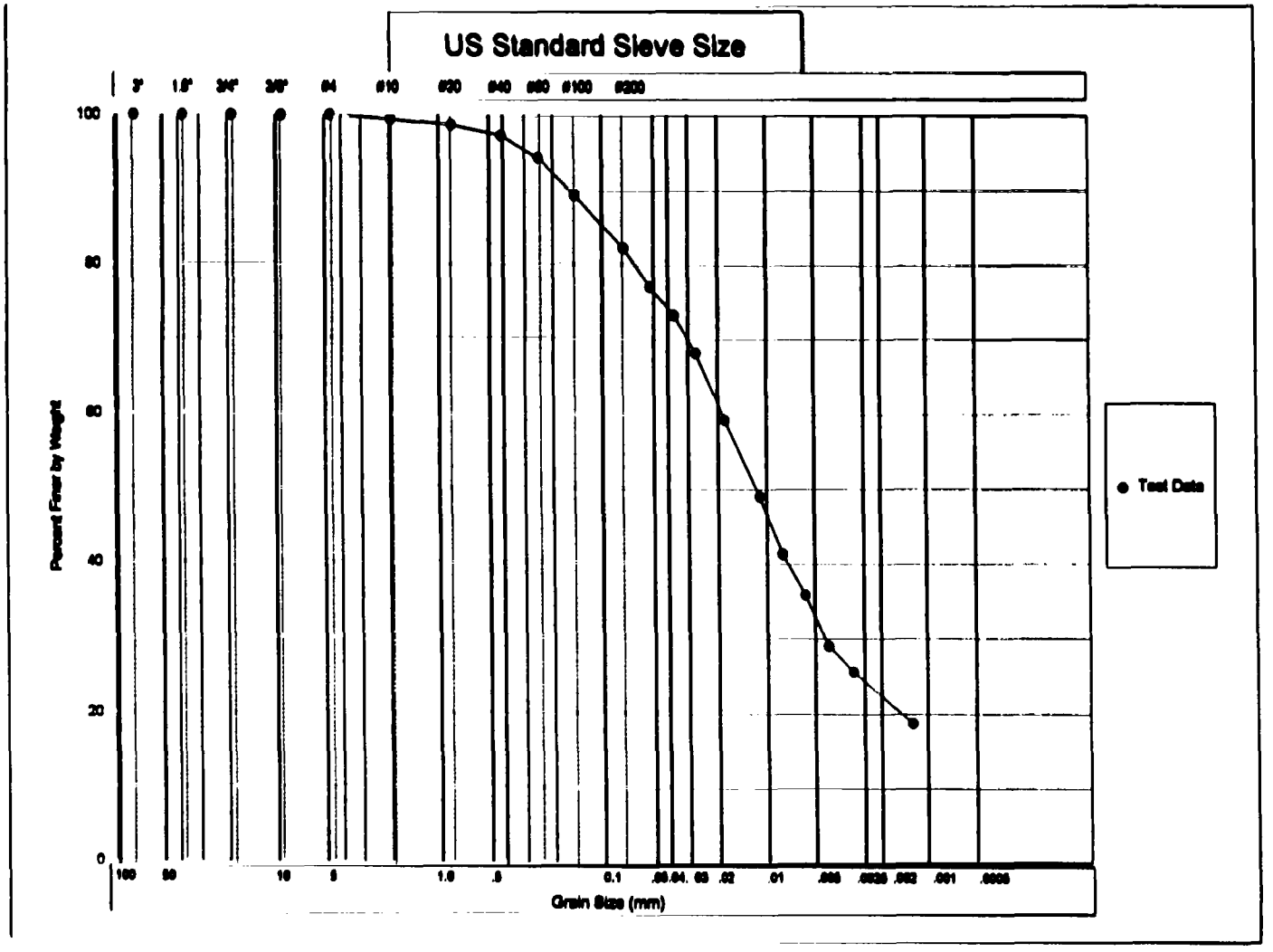
Hydrometer #	ASTM 152 H	Temp., Deg. C	22.5
Sp. Gr. of Soil	2.71	Temp. Coef. K	0.01301
Value of "alpha"	0.99	Wt. Dry Sample "W"	58.102
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	–	–	–	–	–	–
0.5	51.25	45.25	76.9	76.9	7.89	0.0517
1.0	49.00	43.00	73.1	73.1	8.25	0.0374
2.0	46.00	40.00	68.0	68.0	8.75	0.0272
5.0	40.75	34.75	59.1	59.1	9.61	0.0180
15.0	34.75	28.75	48.9	48.9	10.59	0.0109
30.0	30.25	24.25	41.2	41.2	11.33	0.0080
60.0	27.00	21.00	35.7	35.7	11.86	0.0058
120.0	23.00	17.00	28.9	28.9	12.52	0.0042
250.0	21.00	15.00	25.5	25.5	12.85	0.0029
1440.0	17.00	11.00	18.7	18.7	13.50	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 11/21/2000
Data checked by: SR Date: 11-21-00
FileName: RCM047R

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY			USCS
	COARSE	FINE	CRS	MEDIUM	FINE				
COBBLES TO BOULDERS	PEBBLE GRAVEL			SAND			SILT	CLAY	WENTWORTH
	COARSE	MED	FINE	GRAN COARSE	MED	FINE			

Client: RMT, Inc.
Depth: 34.0' - 36.5'
Classification: _____

Boring No.: 33MWC-47
Job Number: 2473-02

Sample No.: R

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC - 49	SAMPLED	
DEPTH	18.0' - 20.5'	DATE TESTED	11/14/00 MC
SAMPLE NO.	J	WASH SIEVE	Yes
SOIL DESCR.		DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	63.89
Wt. Dry Soil & Pan (g)	62.67
Wt. Lost Moisture (g)	1.22
Wt. of Pan Only (g)	3.62
Wt. of Dry Soil (g)	59.05
Moisture Content %	2.1
Wt. Hydrom. Sample Wet (g)	55.53
Wt. Hydrom. Sample Dry (g)	54.40

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	428.02
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	428.02
Weight of - #10 Dry (g)	419.36
Wt. Total Sample Dry (g)	419.36
Calc. Wt. "W" (g)	54.40
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	3.70	3.73	0.03	0.03	0.1	99.9
#40	3.63	3.67	0.04	0.07	0.1	99.9
#60	3.56	3.87	0.31	0.38	0.7	99.3
#100	3.54	4.59	1.05	1.43	2.6	97.4
#200	3.56	5.70	2.14	3.57	6.6	93.4

Data entered by: MC Date: 11/21/2000
Data checked by: SR Date: 11-21-00
FileName: RCM03349

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA
ASTM D 422

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC - 49	SAMPLED	
DEPTH	18.0' - 20.5'	DATE TESTED	11/14/00 MC
SAMPLE NO.	J	WASH SIEVE	Yes
SOIL DESCR.		DRY SIEVE	No
LOCATION	Crab Orchard NWR		

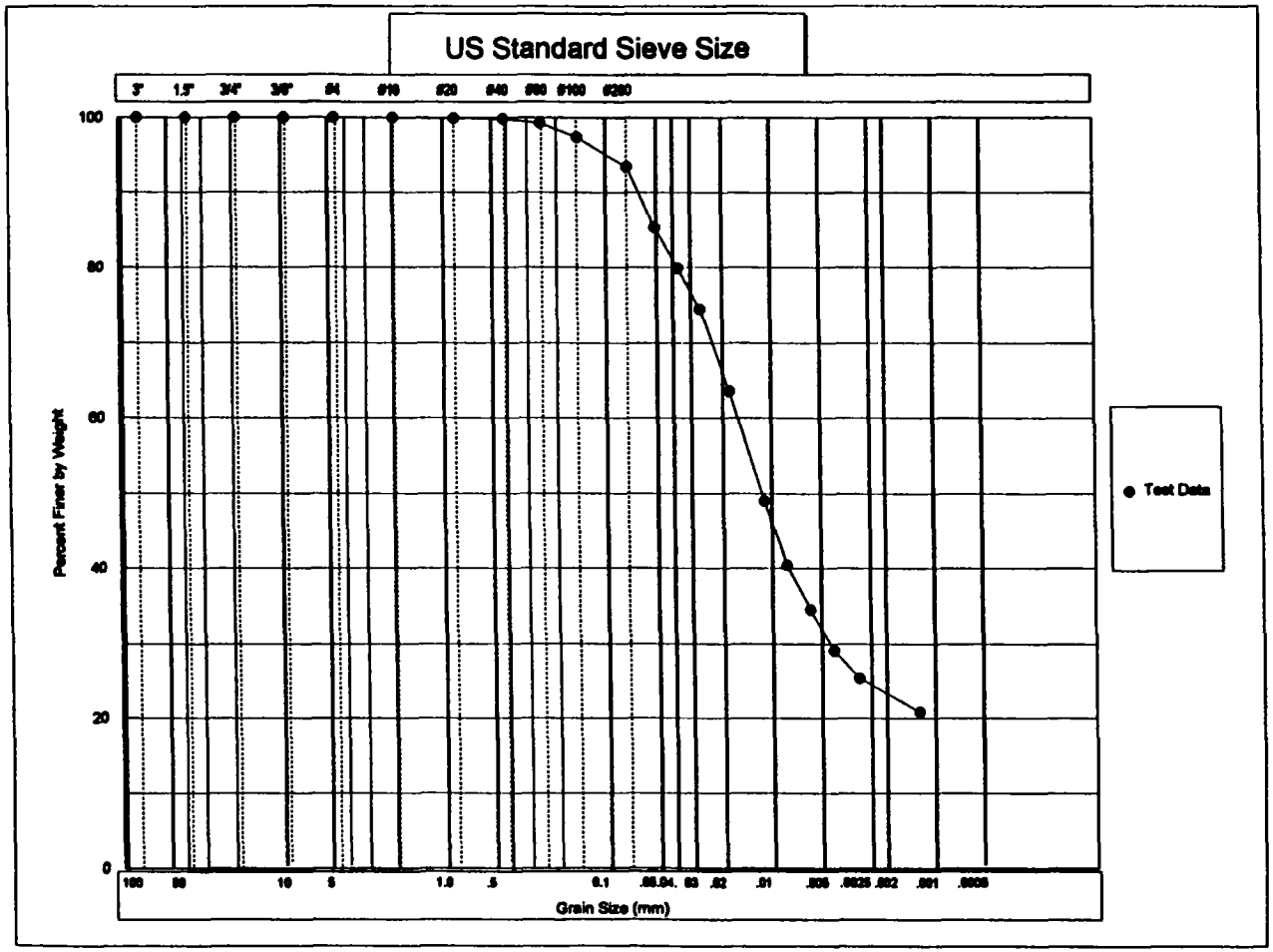
Hydrometer #	ASTM 152 H	Temp., Deg. C	22.8
Sp. Gr. of Soil	2.71	Temp. Coef. K	0.01296
Value of "alpha"	0.99	Wt. Dry Sample "W"	54.402
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	–	–	–	–	–	–
0.5	53.00	47.00	85.4	85.4	7.60	0.0505
1.0	50.00	44.00	79.9	79.9	8.09	0.0369
2.0	47.00	41.00	74.5	74.5	8.58	0.0269
5.0	41.00	35.00	63.6	63.6	9.57	0.0179
15.0	33.00	27.00	49.0	49.0	10.88	0.0110
30.0	28.25	22.25	40.4	40.4	11.66	0.0081
60.0	25.00	19.00	34.5	34.5	12.19	0.0058
120.0	22.00	16.00	29.1	29.1	12.68	0.0042
250.0	20.00	14.00	25.4	25.4	13.01	0.0030
1447.0	17.50	11.50	20.9	20.9	13.42	0.0012

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 11/21/2000
Data checked by: SR Date: 11-21-00
FileName: RCM03349

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	CRS	MEDIUM	FINE	

USCS

COBBLES	PEBBLE GRAVEL				SAND			SILT	CLAY
TO BOULDERS	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

WENTWORTH

Client: RMT, Inc. Boring No.: 33MWC - 49 Sample No.: J
Depth: 18.0' - 20.5' Job Number: 2473-02
Classification: Classification Not Performed

Advanced Terra Testing, Inc.

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MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT RMT, Inc.

JOB NO. 2473-02

BORING NO.	33MWC-49	SAMPLED	
DEPTH	34.0' - 36.5'	DATE TESTED	11/14/00 MC
SAMPLE NO.	R	WASH SIEVE	Yes
SOIL DESCR.	#4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No

Wt. Wet Soil & Pan (g)	59.32
Wt. Dry Soil & Pan (g)	58.76
Wt. Lost Moisture (g)	0.56
Wt. of Pan Only (g)	3.79
Wt. of Dry Soil (g)	54.97
Moisture Content %	1.0
Wt. Hydrom. Sample Wet (g)	57.83
Wt. Hydrom. Sample Dry (g)	57.24

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	436.64
Weight of + #10 Before Washing (g)	8.88
Weight of + #10 After Washing (g)	3.35
Weight of - #10 Wet (g)	427.76
Weight of - #10 Dry (g)	428.92
Wt. Total Sample Dry (g)	432.27
Calc. Wt. "W" (g)	57.69
Calc. Mass + #10	0.45

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	3.35	3.35	3.35	0.8	99.2
#20	3.60	5.14	1.54	1.54	3.4	96.6
#40	3.63	7.20	3.57	5.11	9.6	90.4
#60	3.65	6.19	2.54	7.65	14.0	86.0
#100	3.67	4.56	0.89	8.54	15.6	84.4
#200	3.58	4.06	0.48	9.02	16.4	83.6

Data entered by: MC Date: 12/01/2000
Data checked by: CAL Date: 12/01/00
FileName: RCM049R

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC-49	SAMPLED	
DEPTH	34.0' - 36.5'	DATE TESTED	11/14/00 MC
SAMPLE NO.	R	WASH SIEVE	Yes
SOIL DESCR.	#4781.06	DRY SIEVE	No
LOCATION	Crab Orchard NWR		

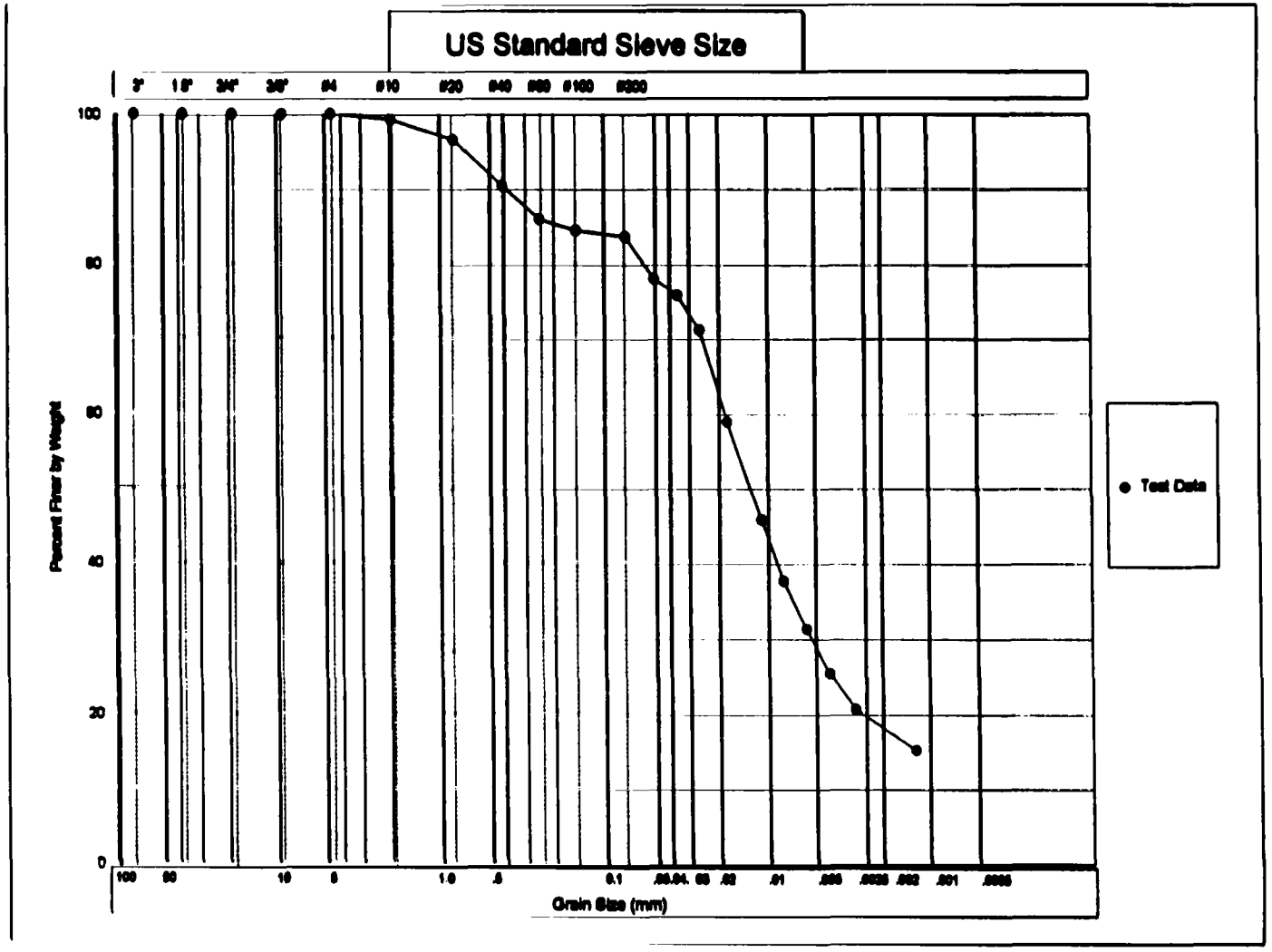
Hydrometer #	ASTM 152 H	Temp., Deg. C	22.8
Sp. Gr. of Soil	2.76	Temp. Coef. K	0.01278
Value of "alpha"	0.98	Wt. Dry Sample "W"	57.690
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	–	–	–	–	–	–
0.5	52.00	46.00	78.0	78.0	7.76	0.0504
1.0	50.75	44.75	75.9	75.9	7.97	0.0361
2.0	48.00	42.00	71.2	71.2	8.42	0.0262
5.0	40.75	34.75	58.9	58.9	9.61	0.0177
15.0	33.00	27.00	45.8	45.8	10.88	0.0109
30.0	28.25	22.25	37.7	37.7	11.66	0.0080
60.0	24.50	18.50	31.4	31.4	12.27	0.0058
120.0	21.00	15.00	25.4	25.4	12.85	0.0042
250.0	18.25	12.25	20.8	20.8	13.30	0.0029
1440.0	15.00	9.00	15.3	15.3	13.83	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 12/01/2000
Data checked by: cal Date: 12/01/00
FileName: RCM049R

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY			USCS
	COARSE	FINE	CRS	MEDIUM	FINE				
COBBLES TO BOULDERS	PEBBLE GRAVEL			SAND			SILT	CLAY	WENTWORTH
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE		

Client: RMT, Inc.
Depth: 34.0' - 36.5'
Classification: _____

Boring No.: 33MWC-49
Job Number: 2473-02

Sample No.: R

Advanced Terra Testing, Inc.

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SPECIFIC GRAVITY
ASTM D 854

SPECIFIC GRAVITY TESTS ASTM D 854

CLIENT: RMT, Inc JOB NO. 2473-02

SOIL DESCR. #4781.06 LOCATION Crab Orchard NWR

BORING NO.	33MWC-47	33MWC-47	33MWC-49	33MWC-49
DEPTH	34.0' - 36.5'	12.0' - 14.5'	18.0' - 20.5'	34.0' - 36.5'
SAMPLE NO.	R	G	J	R
DATE SAMPLED				
DATE TESTED	11/10/00 MC	11/10/00 MC	11/10/00 MC	11/10/00 MC
Pycnometer #	2	3	GG	1
Weight of oven dry soil (g) (Wo)	25.458	25.757	25.300	25.147
Weight of flask, soil, and water. (g) (Wb)	178.081	178.928	183.093	177.830
Temperature (deg. C) (Tx)	25.7	25.6	25.6	25.6
Weight of water & flask at Tx (from cal. curve)(Wa)	162.005	162.504	167.131	161.790
Specific Gravity*	2.71	2.76	2.71	2.76

BORING NO.	33MWC-45	33MWC-45	33MWC-43	33MWC-43
DEPTH			N	F
SAMPLE NO.	X	10.0' - 12.5'	26.0' - 28.5'	10.0' - 12.5'
DATE SAMPLED				
DATE TESTED	11/10/00 MC	11/10/00 MC	11/10/00 MC	11/10/00 MC
Pycnometer #	EE	JJ	KK	6
Weight of oven dry soil (g) (Wo)	25.087	25.031	25.426	25.496
Weight of flask, soil, and water. (g) (Wb)	179.254	178.838	179.425	173.413
Temperature (deg. C) (Tx)	25.5	25.5	25.5	25.6
Weight of water & flask at Tx (from cal. curve)(Wa)	163.396	163.147	163.392	157.229
Specific Gravity*	2.72	2.68	2.71	2.74

*Specific Gravity = Wo/[Wo+(Wa-Wb)]

Data entry by: MC Date: 11/21/2000

Data checked by: CMC Date: 12/01/00

FileName: RCE0NWR2

ADVANCED TERRA TESTING, INC.

TRIAXIAL, BACK-PRESSURE
PERMEABILITY/COMPATIBILITY TESTING
TX/PBP
ASTM D 5084

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT RMT, Inc.

JOB NO. 2473-02

BORING NO.	33MWC-47	SAMPLED	
DEPTH	12.0' - 14.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.	G	TEST FINISHED	10/31/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	21S
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	506.3	507.1
Wt. Wet Soil & Pan (g)	514.7	515.5
Wt. Dry Soil & Pan (g)	425.4	425.4
Wt. Lost Moisture (g)	89.4	90.2
Wt. of Pan Only (g)	8.4	8.4
Wt. of Dry Soil (g)	417.0	417.0
Moisture Content %	21.4	21.6
Wet Density PCF	129.1	129.2
Dry Density PCF	106.3	106.2

Init. Diameter (in)	2.407	(cm)	6.114
Init. Area (sq in)	4.550	(sq cm)	29.359
Init. Height (in)	3.284	(cm)	8.341
Vol. Bef. Consol. (cu ft)	0.00865		
Vol. After Consol. (cu ft)	0.00866		
Porosity %	36.79		

FLOW PUMP CALCULATIONS

Pump Setting	9
Velocity CM/Sec	5.91E-05
Q (cc/s)	1.89E-06
Height	3.250
Diameter	2.421
Pressure (psi)	2.010
Area after consol. (cm*cm)	29.689
Gradient	17.119
Permeability k (cm/s)	3.7E-09
Back Pressure (psi)	68.0
Cell Pressure (psi)	93.0
Ave. Effective Stress (psi)	23.995

Data entry by: MC Date: 11/03/2000
Checked by: cl Date: 11/03/00
FileName: RCP0C472

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT, Inc.	JOB NO.	2473-02
BORING NO.	33MWC-47	SAMPLED	
DEPTH	12.0' - 14.5'	TEST STARTED	10/24/00 CL
SAMPLE NO.	G	TEST FINISHED	10/31/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	21S
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.3	9.1				
50.0	48.0	6.8	7.7	38.9	48.0	9.1	0.91
60.0	58.0	6.9	7.7	49.0	58.4	9.4	0.94
70.0	68.0	7.4	8.2	58.9	68.3	9.4	0.94
80.0		8.4	8.4	69.0	78.8	9.8	0.98

CONSOLIDATION DATA

Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	8.40	0.00
0.25	0.50	10.70	-2.30
0.5	0.71	10.80	-2.40
1	1.00	10.95	-2.55
2	1.41	11.10	-2.70
4	2.00	11.30	-2.90
9	3.00	11.70	-3.30
16	4.00	12.00	-3.60
30	5.48	12.50	-4.10
60	7.75	13.30	-4.90
120	10.95	14.30	-5.90
240	15.49	15.70	-7.30
360	18.97	16.40	-8.00

Initial Height (in)	3.284	Init. Vol. (CC)	244.92
Height Change (in)	0.034	Vol. Change (CC)	17.20
Ht. After Cons. (in)	3.250	Cell Exp. (CC)	17.41
Initial Area (sq in)	4.550	Net Change (CC)	-0.21
Area After Cons. (sq in)	4.602	Cons. Vol. (CC)	245.13

Data entry by: MC Date: 11/03/2000
Checked by: cc Date: 11/03/00
FileName: RCP0C472

ADVANCED TERRA TESTING, INC.

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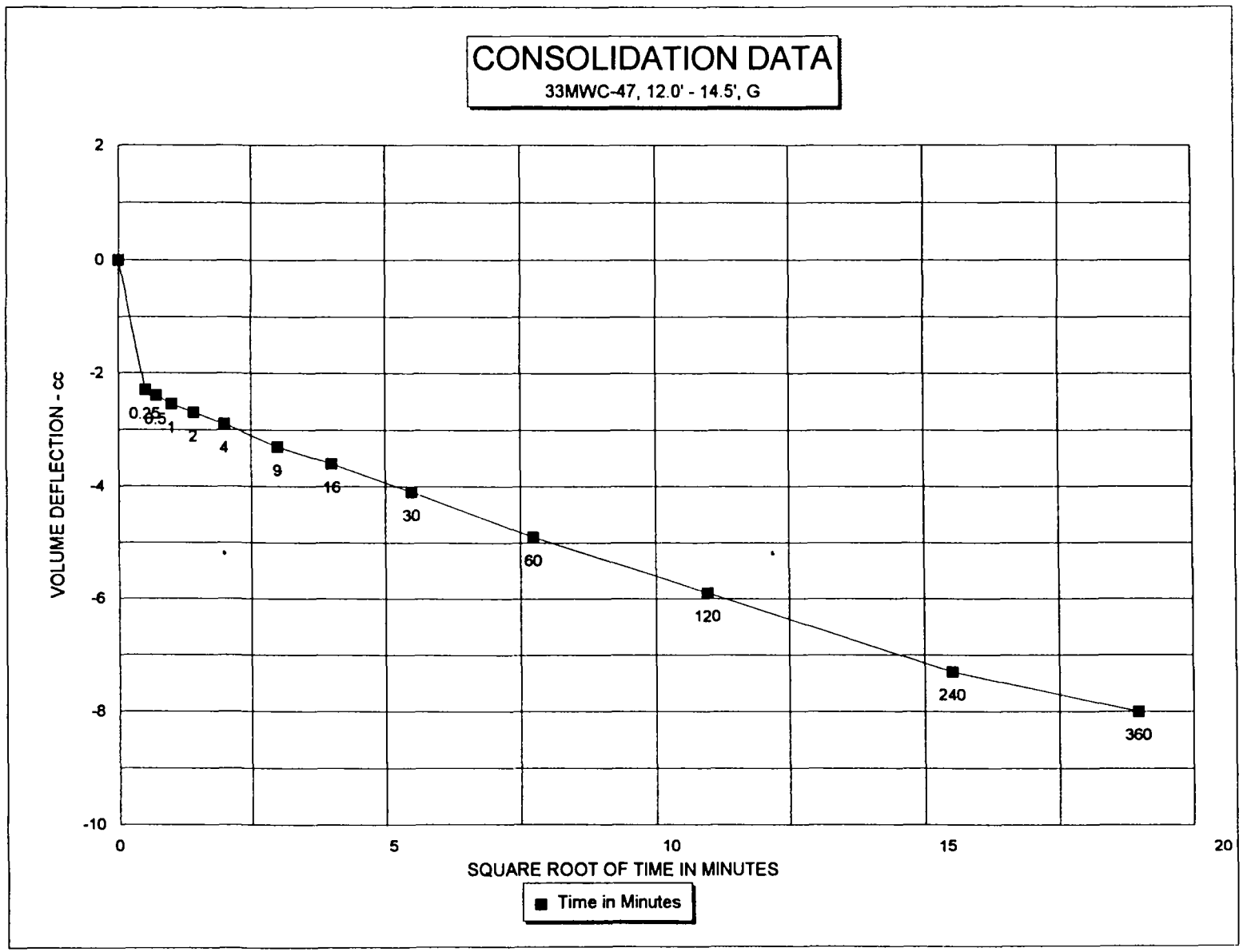
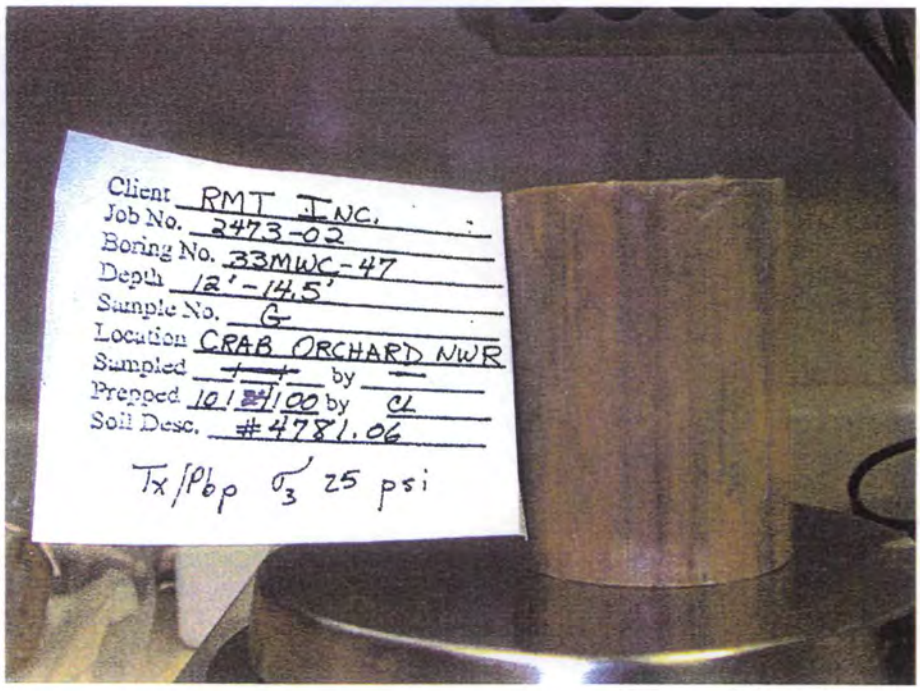

CONSOLIDATION DATA
33MWC-47, 12.0' - 14.5', G
VOLUME DEFLECTION - cc
2
0
-2
-4
-6
-8
-10
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.5
1
2
4
9
16
30
60
120
240
360
Time in Minutes



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10/31/00

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT RMT Inc.

JOB NO. 2473-02

SAMPLE DATE

SOIL DESCR. Job # 4781.06

LOCATION Crab Orchard NWR

TEST STARTED 11/10/00 CL/DPM

TEST FINISHED 1/8/01 DPM

MASS DATA

Sample Description	Ring Mass g	As Rec. Mass Sample & Ring g	Sat. Mass Filter & Ring g	0.3 Bar Mass g	0.7 Bar Mass g	2 Bar Mass g	5 Bar Mass g	15 Bar Mass g	Dry Mass Filter, Ring, & Dish g	Dish Wt. g
Filter Mass g		0.224	0.655	0.384	0.318	0.310	0.298	0.280		
33MWC-45, X	10.391	50.981	52.135	50.888	50.510	49.953	49.493	48.429	45.938	0.972
33MWC-45, X R	10.560	50.463	51.732	47.540	46.758	46.030	45.515	45.071	45.065	0.999
33 MWC-47, R @ 34.0' - 36.5'	10.567	49.322	50.560	49.489	49.213	48.786	48.115	46.860	45.065	2.343
33 MWC-47, R @ 34.0' - 36.5' R	10.749	50.765	52.166	51.067	50.817	50.219	49.021	47.682	46.455	2.364
33 MWC-43, F @ 10.0' - 12.5'	10.375	49.488	51.592	49.982	49.552	48.655	47.847	47.059	44.175	1.000
33 MWC-43, F @ 10.0' - 12.5' R	10.752	50.520	52.066	50.941	50.666	49.801	48.935	48.155	45.510	0.970
33 MWC-49, J @ 18.0' - 20.5'	10.363	49.241	50.821	49.750	49.495	48.572	47.334	45.734	44.769	2.348
33 MWC-49, J @ 18.0' - 20.5' R	10.498	49.571	50.841	50.011	49.802	48.853	47.499	45.876	45.039	2.351
33 MWC-43, N @ 26.0' - 28.5'	10.754	50.541	51.403	50.781	50.550	50.049	49.420	48.069	44.039	0.994
33 MWC-43, N @ 26.0' - 28.5' R	10.774	49.589	51.206	49.884	49.614	49.114	48.511	47.433	43.388	0.994
33MWC-47, G @ 12.0' - 14.5'	10.705	50.738	52.045	51.492	51.177	50.647	49.976	49.091	44.889	0.989
33MWC-47, G @ 12.0' - 14.5' R	10.736	49.933	52.571	51.124	50.600	49.949	49.362	48.577	44.144	0.990

Data Entered By: MC Date: 01/15/2001

Data Checked By: DPM Date: 1/15/01

Filename: RCK03345

ADVANCED TERRA TESTING, INC.

159

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT RMT Inc.

JOB NO. 2473-02

SAMPLE DATE

SOIL DESCR. Job # 4781.06

LOCATION Crab Orchard NWR

TEST STARTED 11/10/00 CL/DPM

TEST FINISHED 1/8/01 DPM

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	Sample Conditions							0.3 Bar	
	Dry Mass (g)	Unit Wt. (g/cc)	Sat. Mass (g)	Total H2O (g)	Sat. M.C. % D.M.	Sat. M.C. % Vol.	Retained H2O	% DM	% Vol.
33MWC-45, X	34.351	1.777	41.089	6.738	19.615	34.848	5.762	16.774	29.800
33MWC-45, X R	33.282	1.721	40.517	7.235	21.738	37.418	3.314	9.957	17.139
33 MWC-47, R @ 34.0' - 36.5'	31.931	1.651	39.338	7.407	23.197	38.308	6.607	20.691	34.170
33 MWC-47, R @ 34.0' - 36.5' R	33.118	1.713	40.762	7.644	23.081	39.533	6.816	20.581	35.251
33 MWC-43, F @ 10.0' - 12.5'	32.576	1.685	40.562	7.986	24.515	41.302	6.647	20.405	34.377
33 MWC-43, F @ 10.0' - 12.5' R	33.564	1.736	40.659	7.095	21.139	36.694	6.241	18.594	32.277
33 MWC-49, J @ 18.0' - 20.5'	31.834	1.646	39.803	7.969	25.033	41.214	7.169	22.520	37.077
33 MWC-49, J @ 18.0' - 20.5' R	31.966	1.653	39.688	7.722	24.157	39.937	7.163	22.408	37.046
33 MWC-43, N @ 26.0' - 28.5'	32.067	1.658	39.994	7.927	24.720	40.997	7.576	23.626	39.182
33 MWC-43, N @ 26.0' - 28.5' R	31.396	1.624	39.777	8.381	26.694	43.345	7.330	23.347	37.909
33MWC-47, G @ 12.0' - 14.5'	32.971	1.705	40.685	7.714	23.396	39.895	7.432	22.541	38.437
33MWC-47, G @ 12.0' - 14.5' R	32.194	1.665	41.180	8.986	27.912	46.474	7.810	24.259	40.392

Data Entered By: MC Date: 01/15/2001

Data Checked By: DPM Date: 1/15/01

Filename: RCK03345

ADVANCED TERRA TESTING, INC.

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	RMT Inc.	JOB NO.	2473-02
SAMPLE DATE		TEST STARTED	11/10/00 CL/DPM
SOIL DESCR.	Job # 4781.06	TEST FINISHED	1/8/01 DPM
LOCATION	Crab Orchard NWR		

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	0.7 Bar			2.0 Bar			5.0 Bar			15.0 Bar		
	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
33MWC-45, X	5.450	15.866	28.186	4.901	14.267	25.347	4.453	12.963	23.030	3.407	9.918	17.620
33MWC-45, X R	2.598	7.806	13.436	1.878	5.643	9.713	1.375	4.131	7.111	0.949	2.851	4.908
33 MWC-47, R @ 34.0' - 36.5'	6.397	20.034	33.084	5.978	18.722	30.917	5.319	16.658	27.509	4.062	12.784	21.111
33 MWC-47, R @ 34.0' - 36.5' R	6.632	20.025	34.299	6.042	18.244	31.248	4.856	14.663	25.114	3.535	10.674	18.282
33 MWC-43, F @ 10.0' - 12.5'	6.283	19.287	32.494	5.394	16.558	27.897	4.598	14.115	23.780	3.828	11.751	19.798
33 MWC-43, F @ 10.0' - 12.5' R	6.032	17.972	31.198	5.175	15.418	26.764	4.321	12.874	22.347	3.559	10.604	18.408
33 MWC-49, J @ 18.0' - 20.5'	6.980	21.926	36.099	6.065	19.052	31.367	4.839	15.201	25.026	3.257	10.231	16.845
33 MWC-49, J @ 18.0' - 20.5' R	7.020	21.961	36.306	6.079	19.017	31.439	4.737	14.819	24.499	3.132	9.798	16.198
33 MWC-43, N @ 26.0' - 28.5'	7.411	23.111	38.328	6.918	21.574	35.779	6.301	19.649	32.588	4.968	15.493	25.694
33 MWC-43, N @ 28.0' - 28.5' R	7.126	22.697	36.854	6.634	21.130	34.310	6.043	19.248	31.253	4.983	15.871	25.771
33MWC-47, G @ 12.0' - 14.5'	7.183	21.786	37.149	8.661	20.203	34.449	6.002	18.204	31.041	5.135	15.574	26.557
33MWC-47, G @ 12.0' - 14.5' R	7.352	22.837	38.023	6.709	20.839	34.698	6.134	19.053	31.724	5.367	16.671	27.757

Data Entered By: DPM MC Date: 01/15/2001
Data Checked By: Date: 1/15/01
Filename: RCK03345

ADVANCED TERRA TESTING, INC.

5

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT RMT Inc.

JOB NO. 2473-02

SAMPLE DATE

TEST STARTED 11/10/00 CL/DPM

SOIL DESCR. Job # 4781.05

TEST FINISHED 1/8/01 DPM

LOCATION Crab Orchard NWR

	Vol. MC % Sat.	Vol. MC % 0.3 Bar	Vol. MC % 0.7 Bar	Vol. MC % 2 Bar	Vol. MC % 5 Bar	Vol. MC % 15 Bar
33MWC-45, X	34.85	29.80	28.19	25.35	23.03	17.62
33MWC-45, X R	37.42	17.14	13.44	9.71	7.11	4.91
33 MWC-47, R @ 34.0' - 36.5'	38.31	34.17	33.08	30.92	27.51	21.11
33 MWC-47, R @ 34.0' - 36.5' R	39.53	35.25	34.30	31.25	25.11	18.28
33 MWC-43, F @ 10.0' - 12.5'	41.30	34.38	32.49	27.90	23.78	19.80
33 MWC-43, F @ 10.0' - 12.5' R	36.69	32.28	31.20	26.76	22.35	18.41
33 MWC-49, J @ 18.0' - 20.5'	41.21	37.08	36.10	31.37	25.03	16.84
33 MWC-49, J @ 18.0' - 20.5' R	39.94	37.05	36.31	31.44	24.50	16.20
33 MWC-43, N @ 28.0' - 28.5'	41.00	39.18	38.33	35.78	32.59	25.69
33 MWC-43, N @ 28.0' - 28.5' R	43.34	37.91	36.85	34.31	31.25	25.77
33MWC-47, G @ 12.0' - 14.5'	39.90	38.44	37.15	34.45	31.04	26.56
33MWC-47, G @ 12.0' - 14.5' R	46.47	40.39	38.02	34.70	31.72	27.76

% Saturation

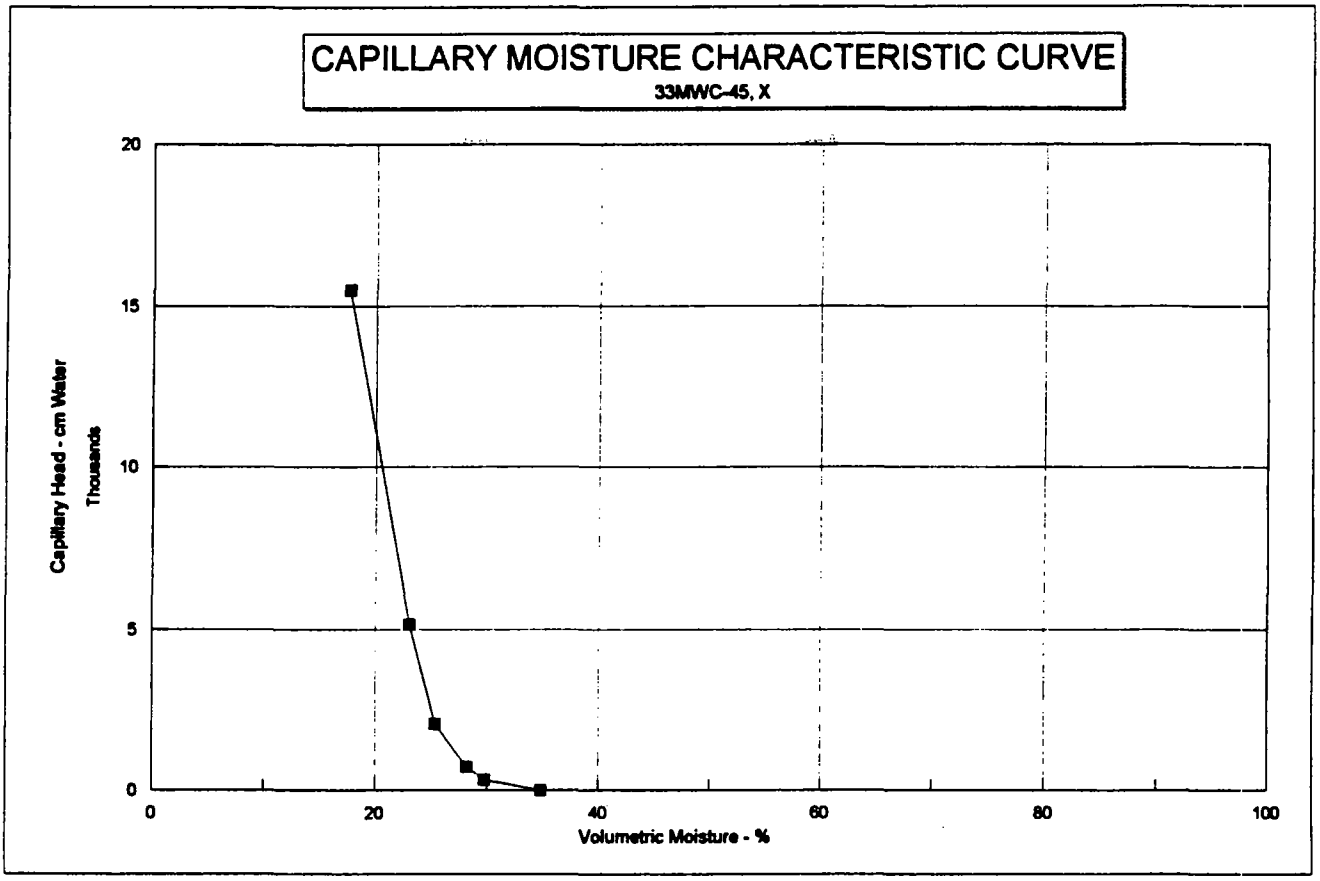
	Sat.	0.3 Bar	0.7 Bar	2 Bar	5 Bar	15 Bar
33MWC-45, X	100.00	85.51	80.88	72.74	66.09	50.56
33MWC-45, X R	100.00	45.81	35.91	25.96	19.00	13.12
33 MWC-47, R @ 34.0' - 36.5'	100.00	89.20	86.36	80.71	71.81	55.11
33 MWC-47, R @ 34.0' - 36.5' R	100.00	89.17	86.76	79.04	63.53	46.25
33 MWC-43, F @ 10.0' - 12.5'	100.00	83.23	78.68	67.54	57.58	47.93
33 MWC-43, F @ 10.0' - 12.5' R	100.00	87.96	85.02	72.94	60.90	50.16
33 MWC-49, J @ 18.0' - 20.5'	100.00	89.96	87.59	76.11	60.72	40.87
33 MWC-49, J @ 18.0' - 20.5' R	100.00	92.76	90.91	78.72	61.34	40.56
33 MWC-43, N @ 28.0' - 28.5'	100.00	95.57	93.49	87.27	79.49	62.67
33 MWC-43, N @ 28.0' - 28.5' R	100.00	87.46	85.03	79.16	72.10	59.46
33MWC-47, G @ 12.0' - 14.5'	100.00	96.34	93.12	86.35	77.81	66.57
33MWC-47, G @ 12.0' - 14.5' R	100.00	86.91	81.82	74.66	68.26	59.73

Data Entered By: MC Date: 01/15/2001

Data Checked By: DPM Date: 1/15/01

Filename: RCK03345

ADVANCED TERRA TESTING, INC.


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-45, X
Capillary Head - cm Water
Thousands
20
15
10
5
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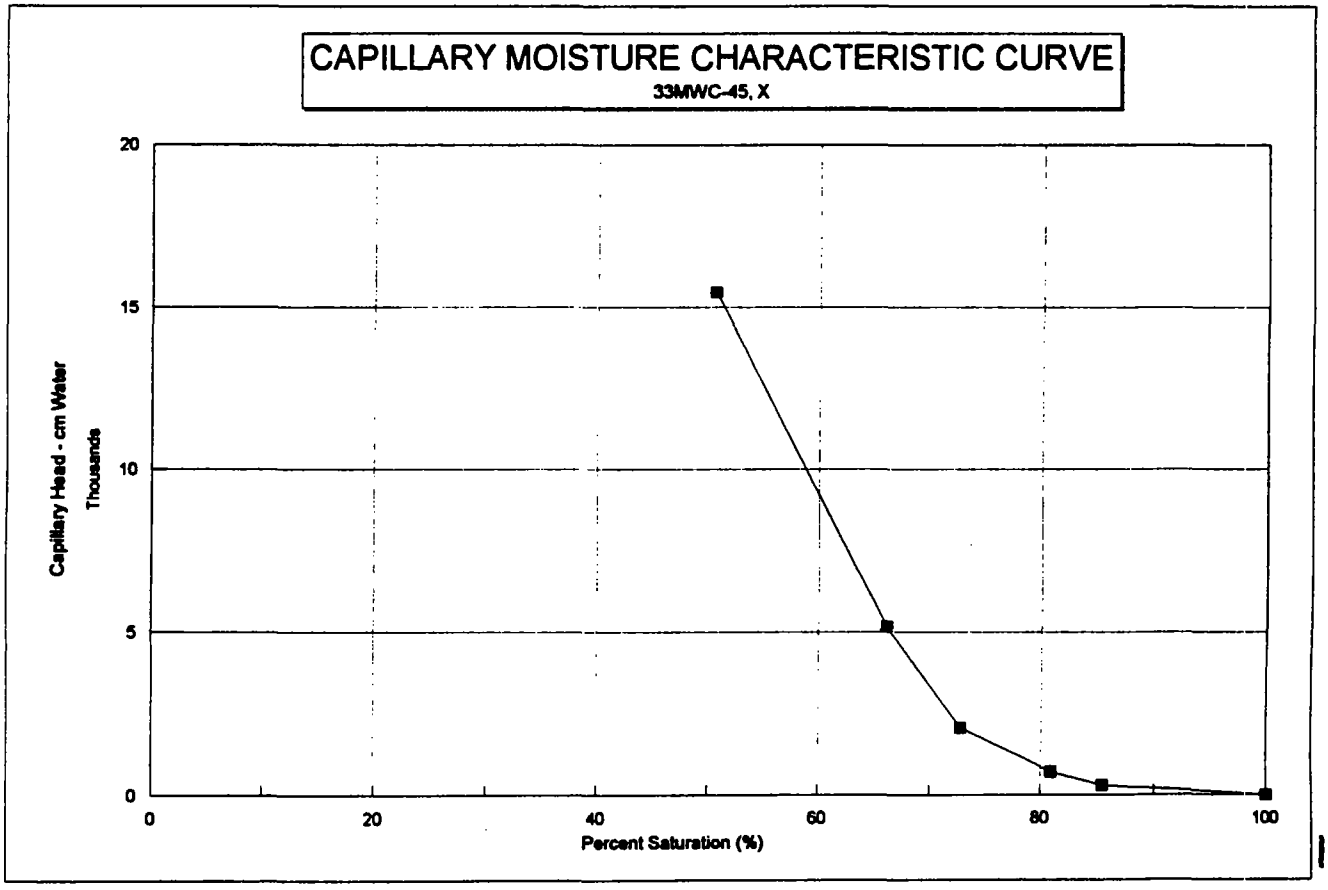
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-45, X
Capillary Head - cm Water
Thousands
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15
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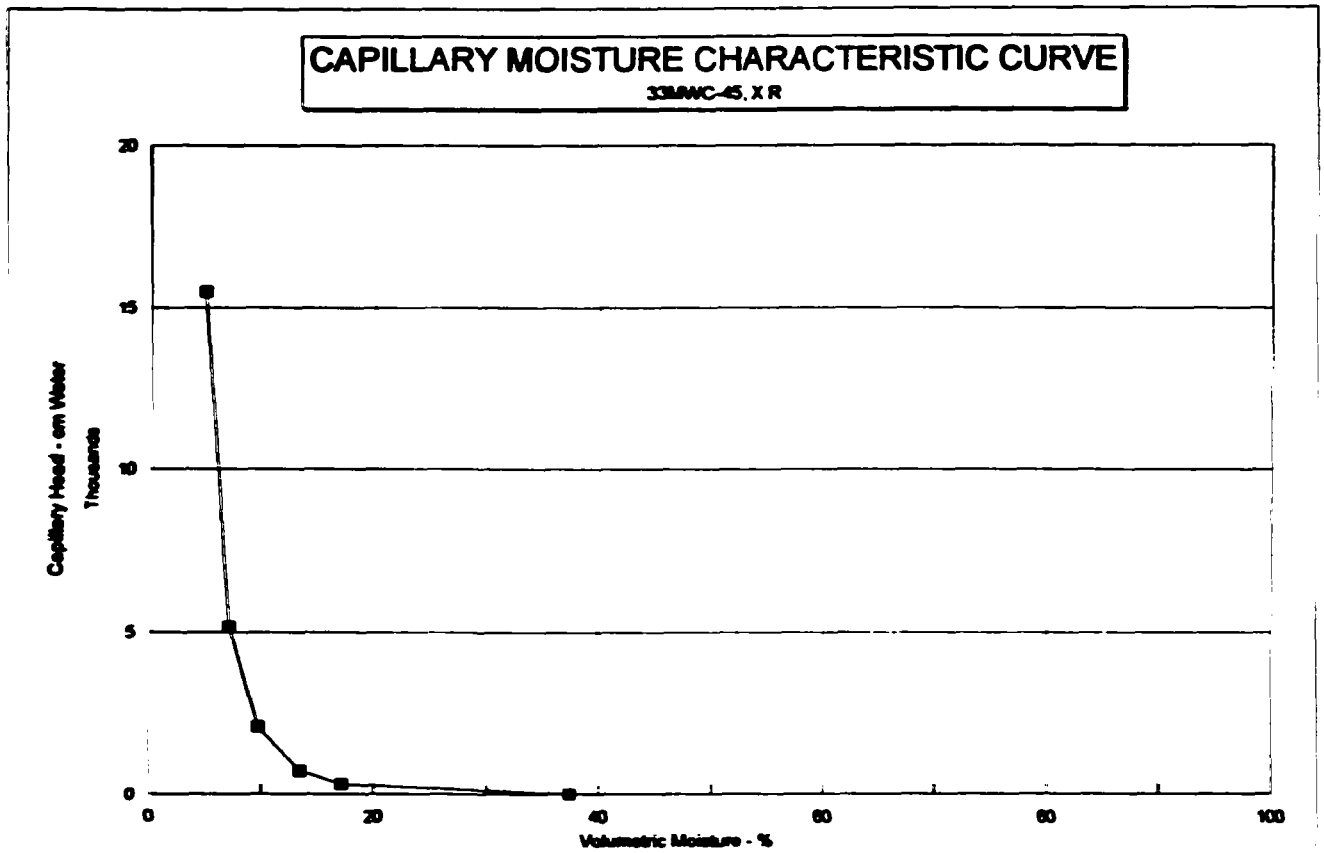
80
100
Percent Saturation (%)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33MWC-45, X R
Capillary Head - cm Water
Thousands
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15
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0
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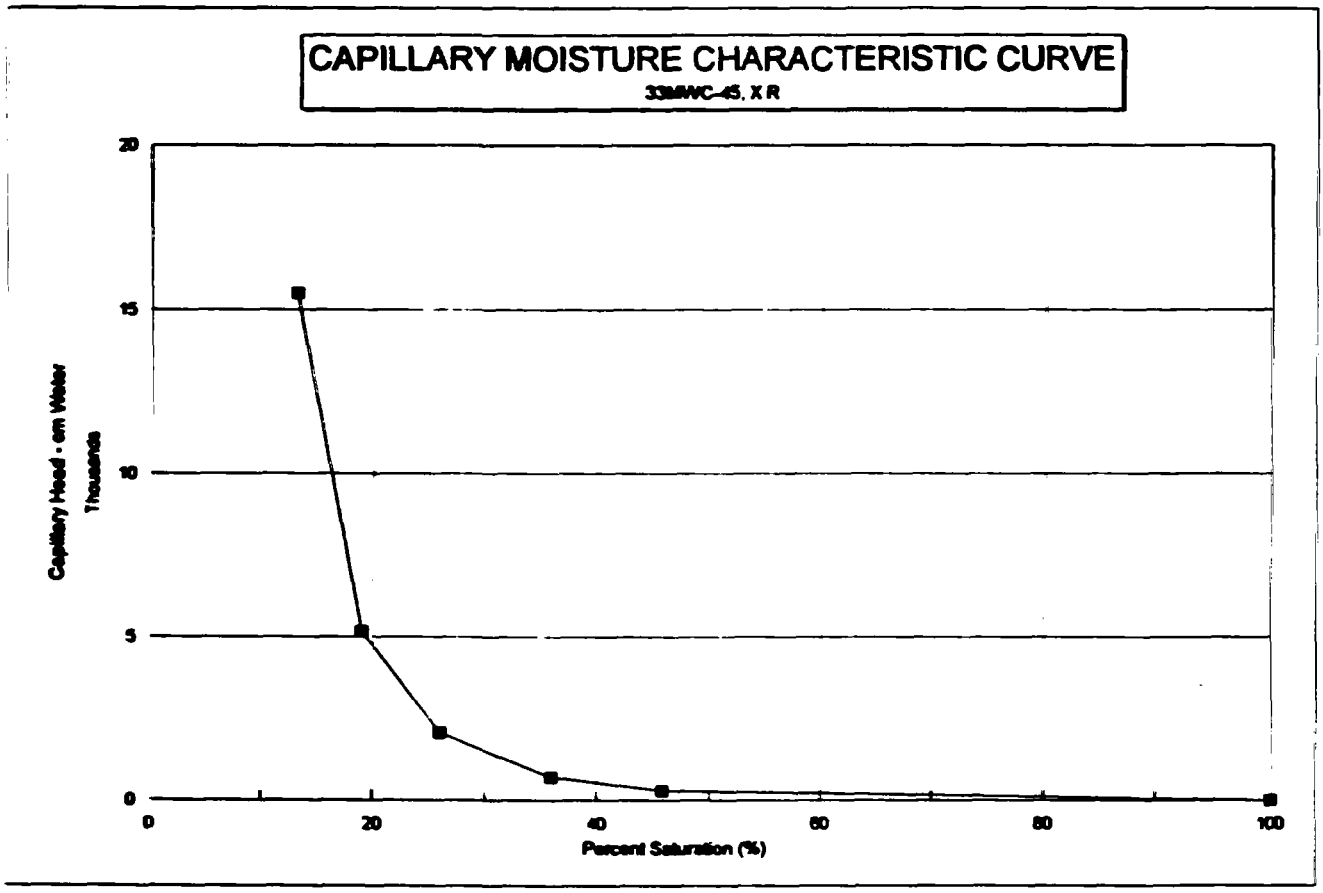
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-45, X R
Capillary Head - cm Water
Thousands
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15
10
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0
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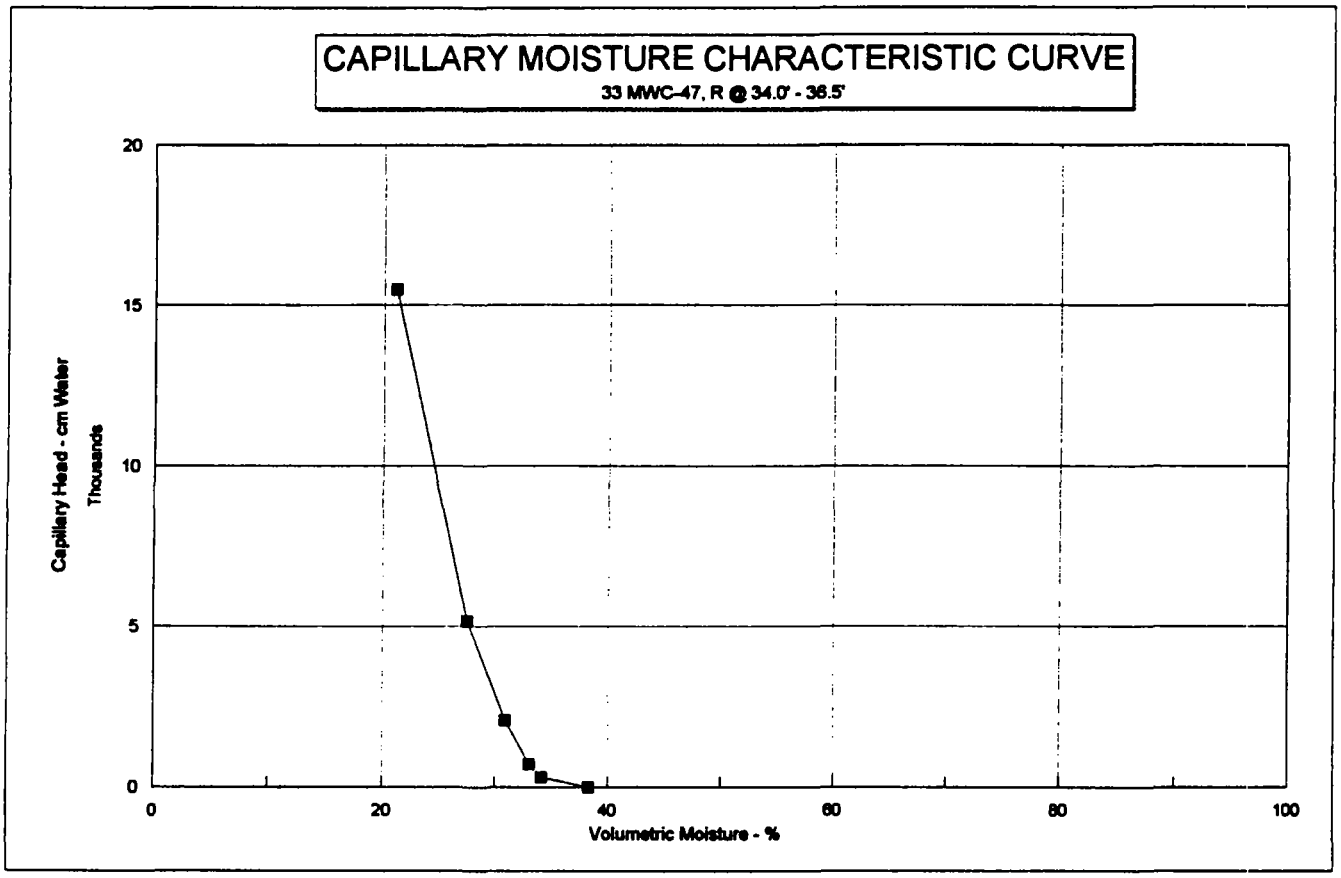
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-47, R @ 34.0' - 36.5'
Capillary Head - cm Water
Thousands
20
15
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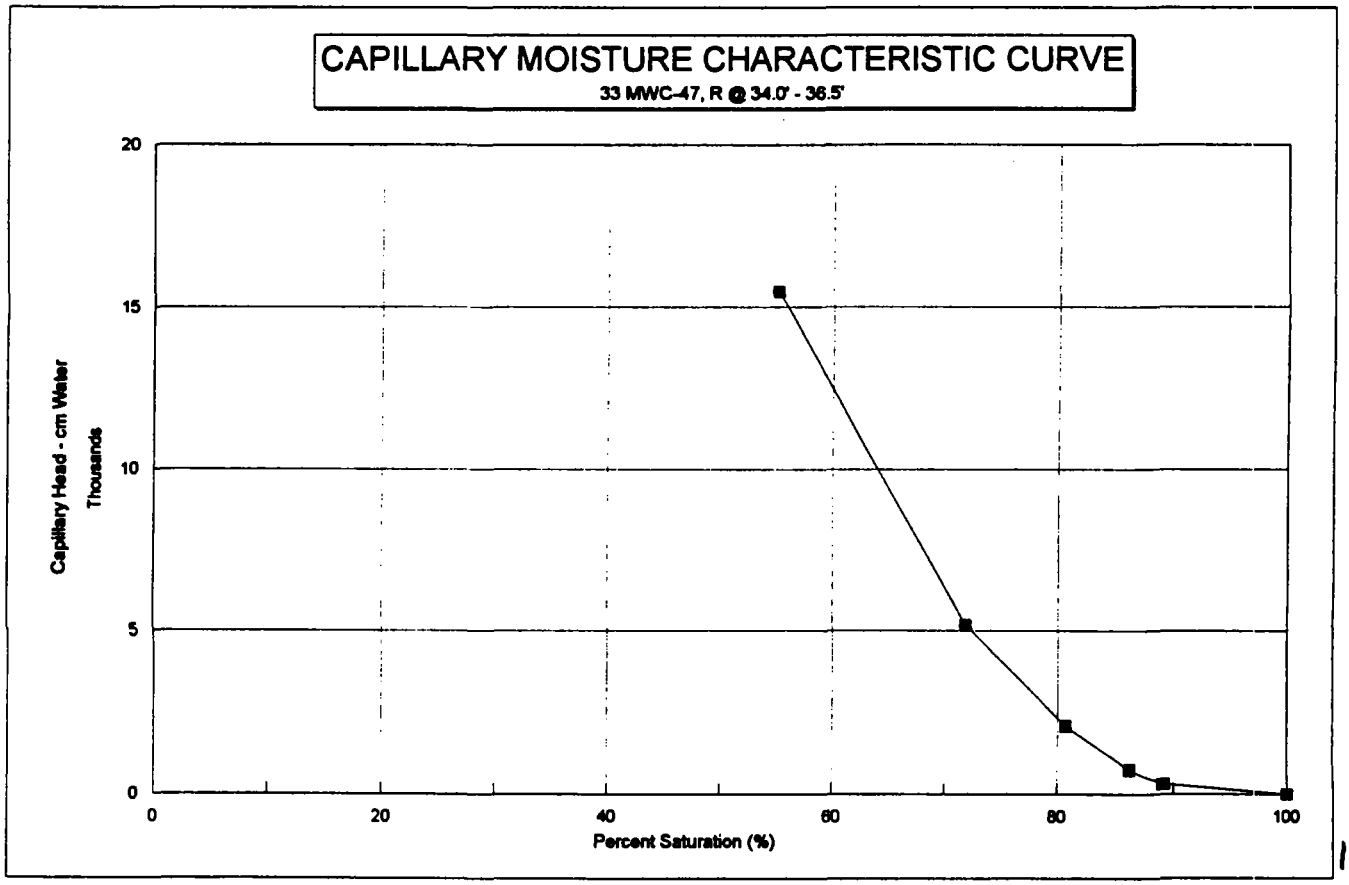
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-47, R @ 34.0' - 36.5'
Capillary Head - cm Water
Thousands
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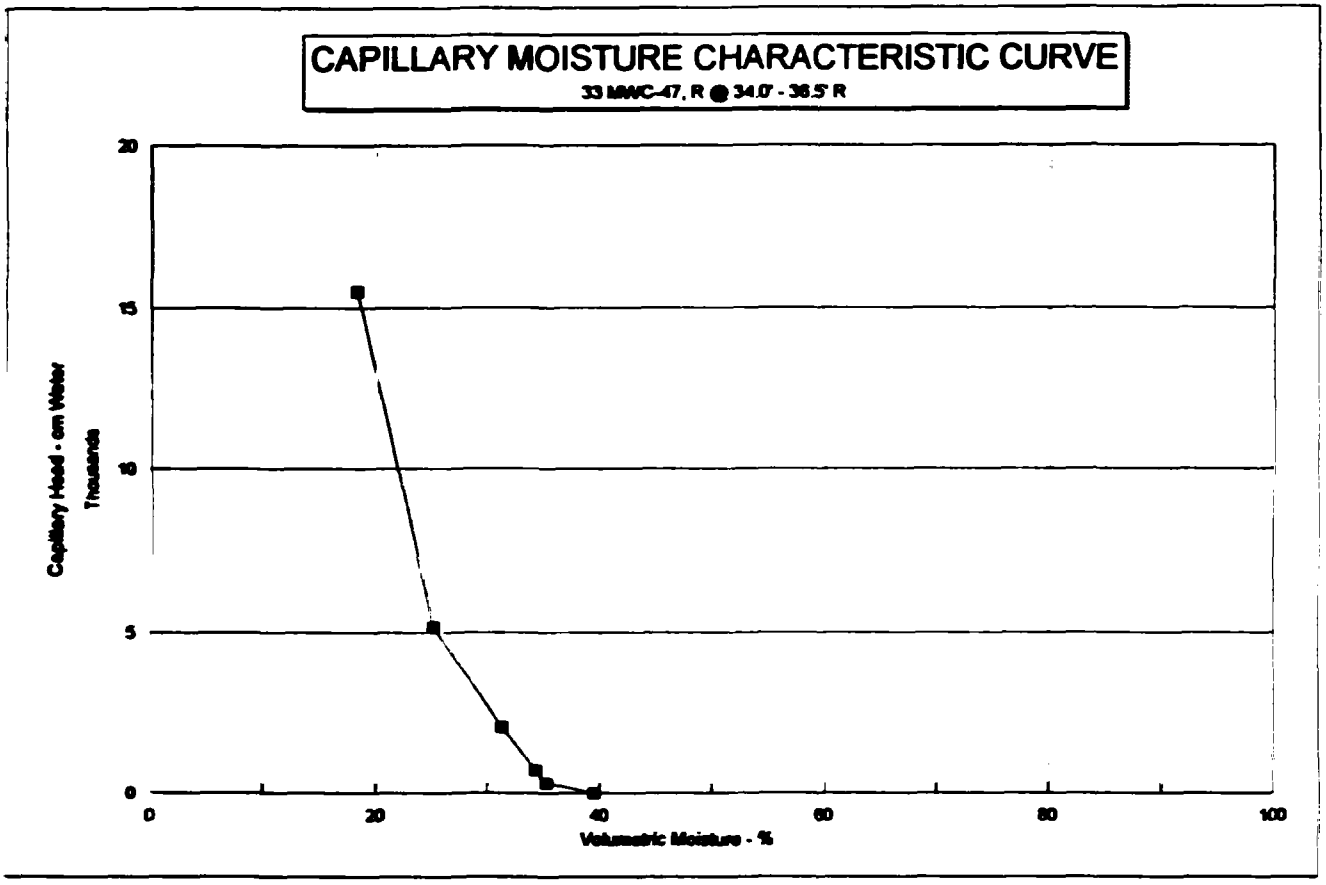
15
10
5
0
0
20
40
60
80
100
Percent Saturation (%)

165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33 MWC-47, R @ 34.0' - 36.5' R
Capillary Head - cm Water
Thousands
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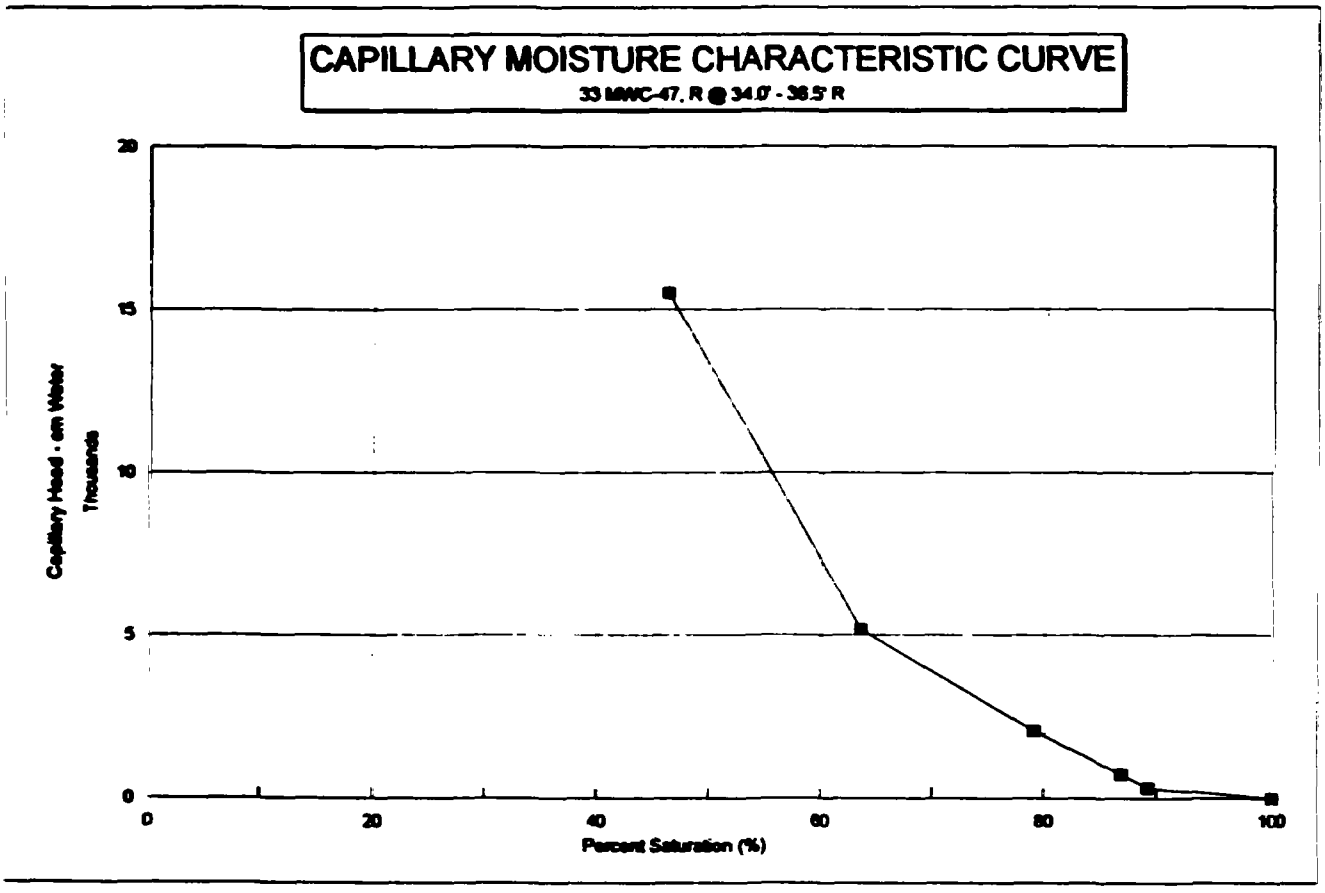
15
10
5
0
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-47, R @ 34.0' - 36.5' R
Capillary Head - cm Water
Thousands
20
15
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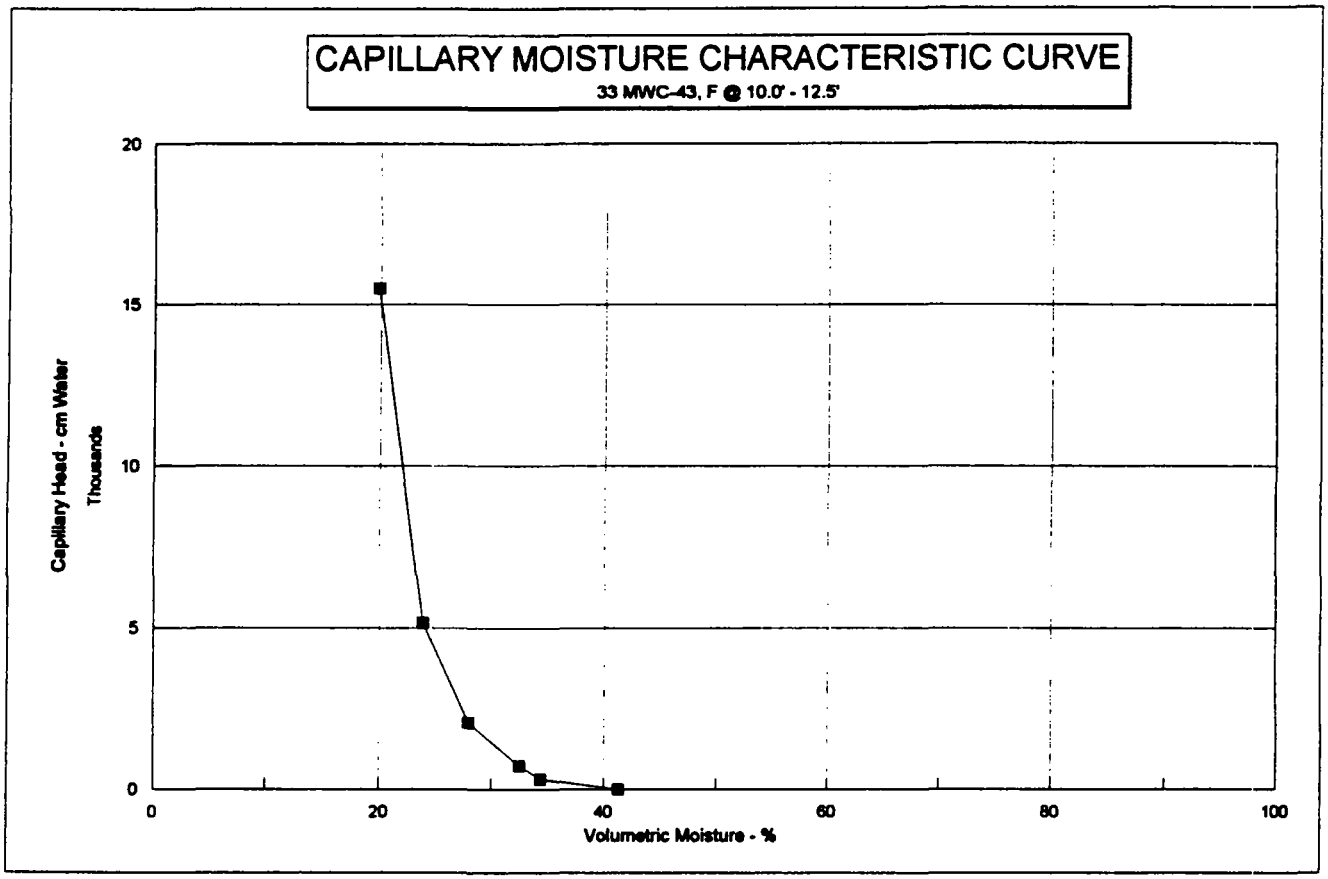
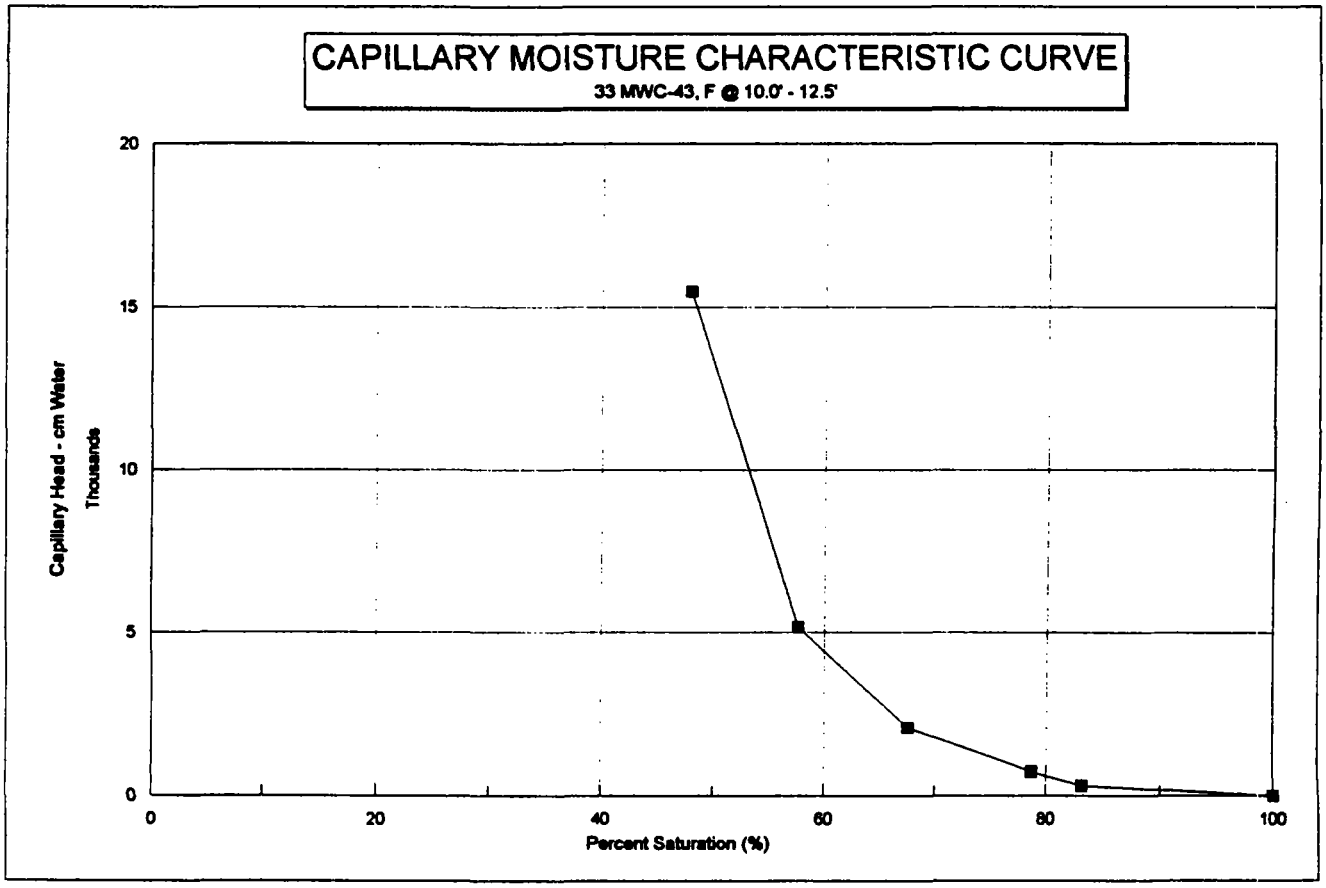
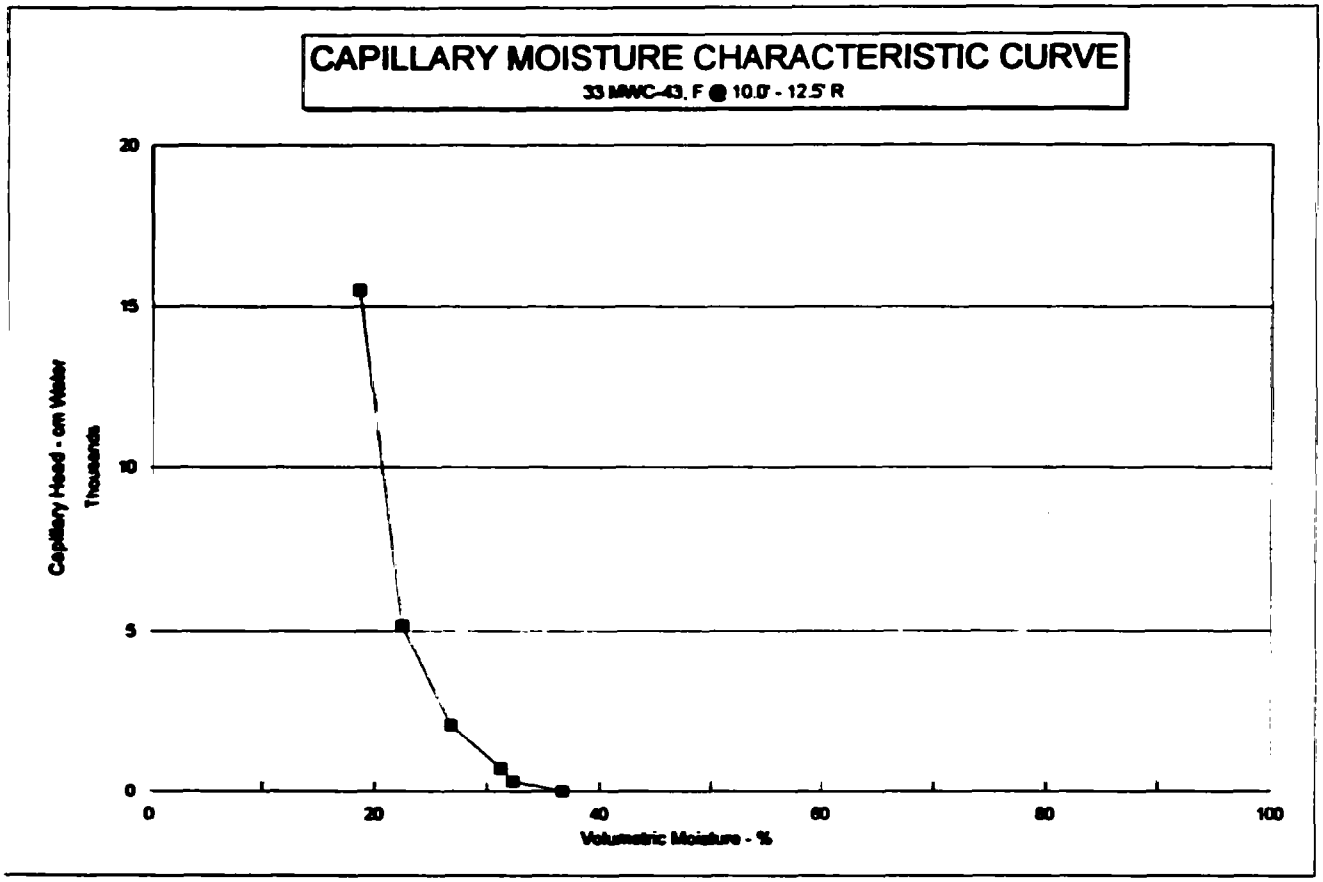
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-43, F @ 10.0' - 12.5'
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-43, F @ 10.0' - 12.5'
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-43, F @ 10.0' - 12.5' R
Capillary Head - cm Water
Thousands
20
15
10
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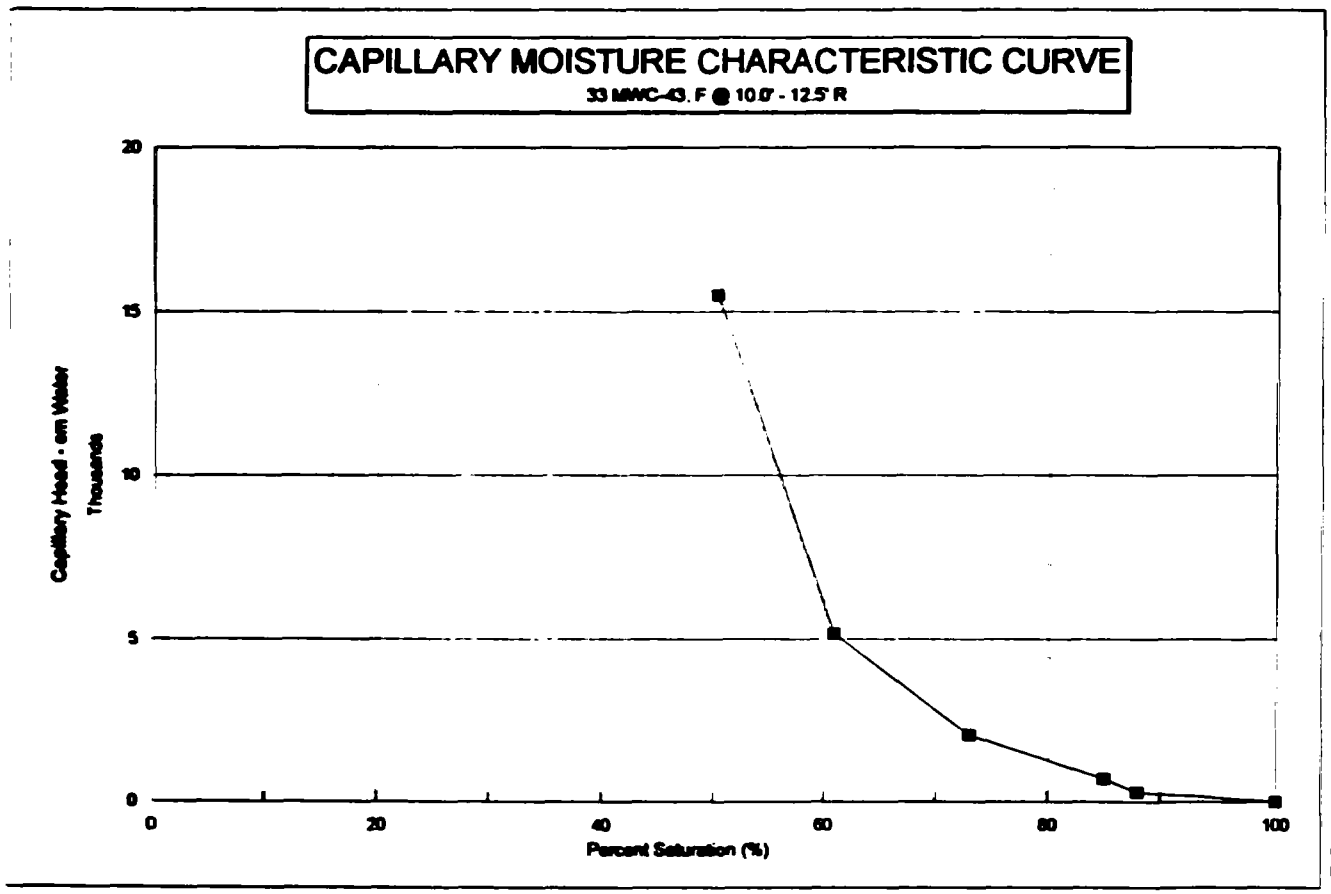
0
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-43, F @ 10.0' - 12.5' R
Capillary Head - cm Water
Thousands
20
15
10
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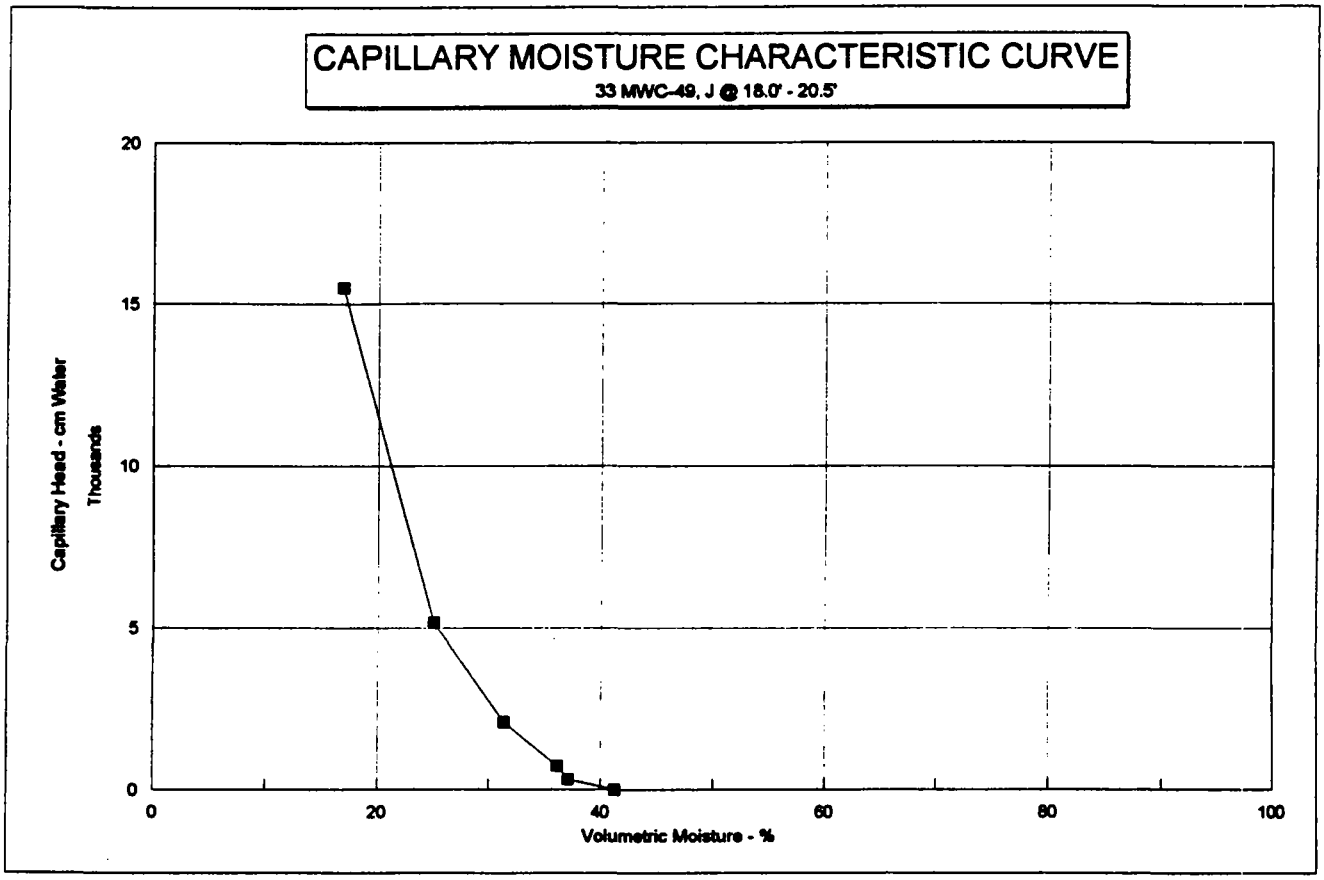
0
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-49, J @ 18.0' - 20.5'
Capillary Head - cm Water
Thousands
20
15
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0
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20
40
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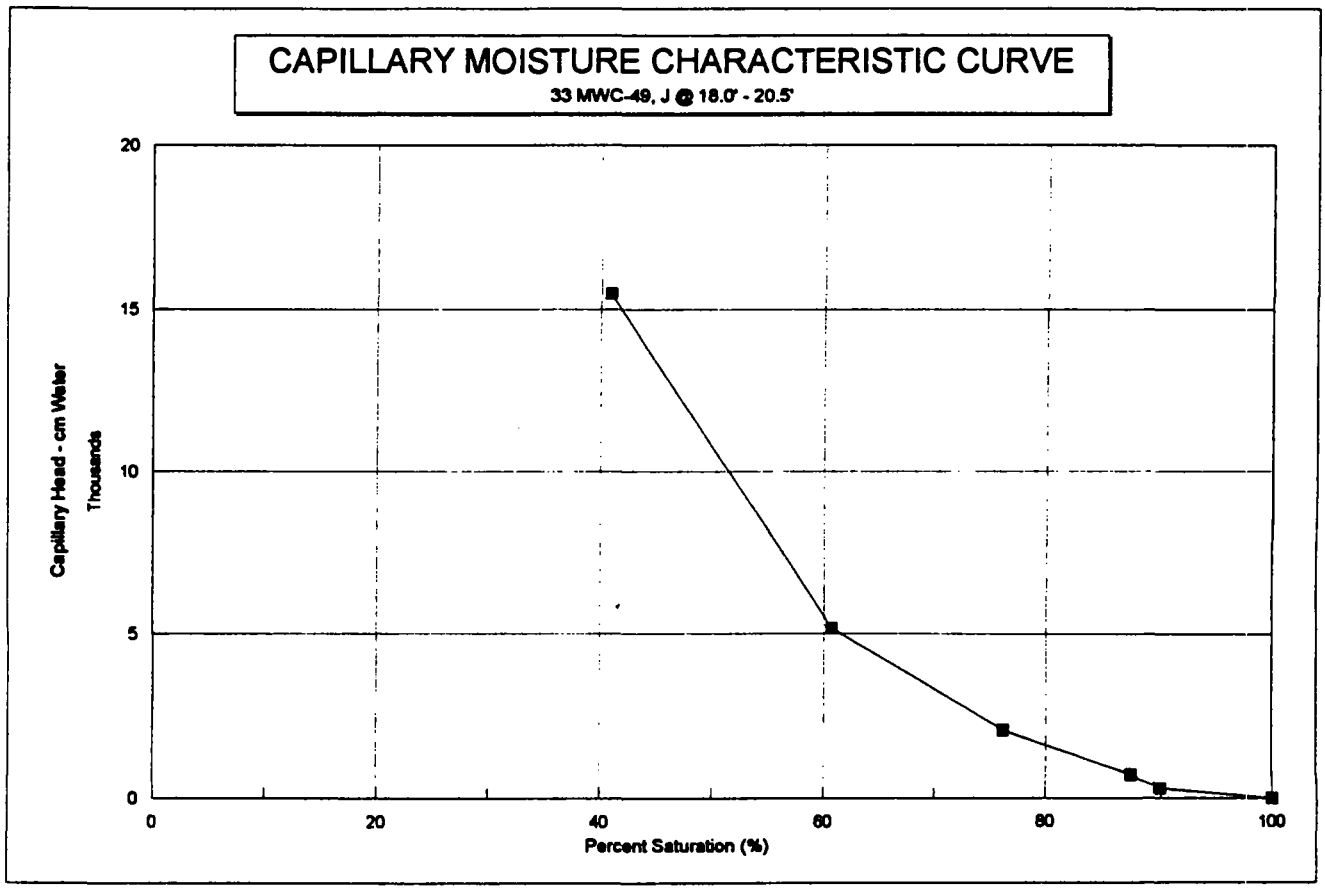
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-49, J @ 18.0' - 20.5'
Capillary Head - cm Water
Thousands
20
15
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5
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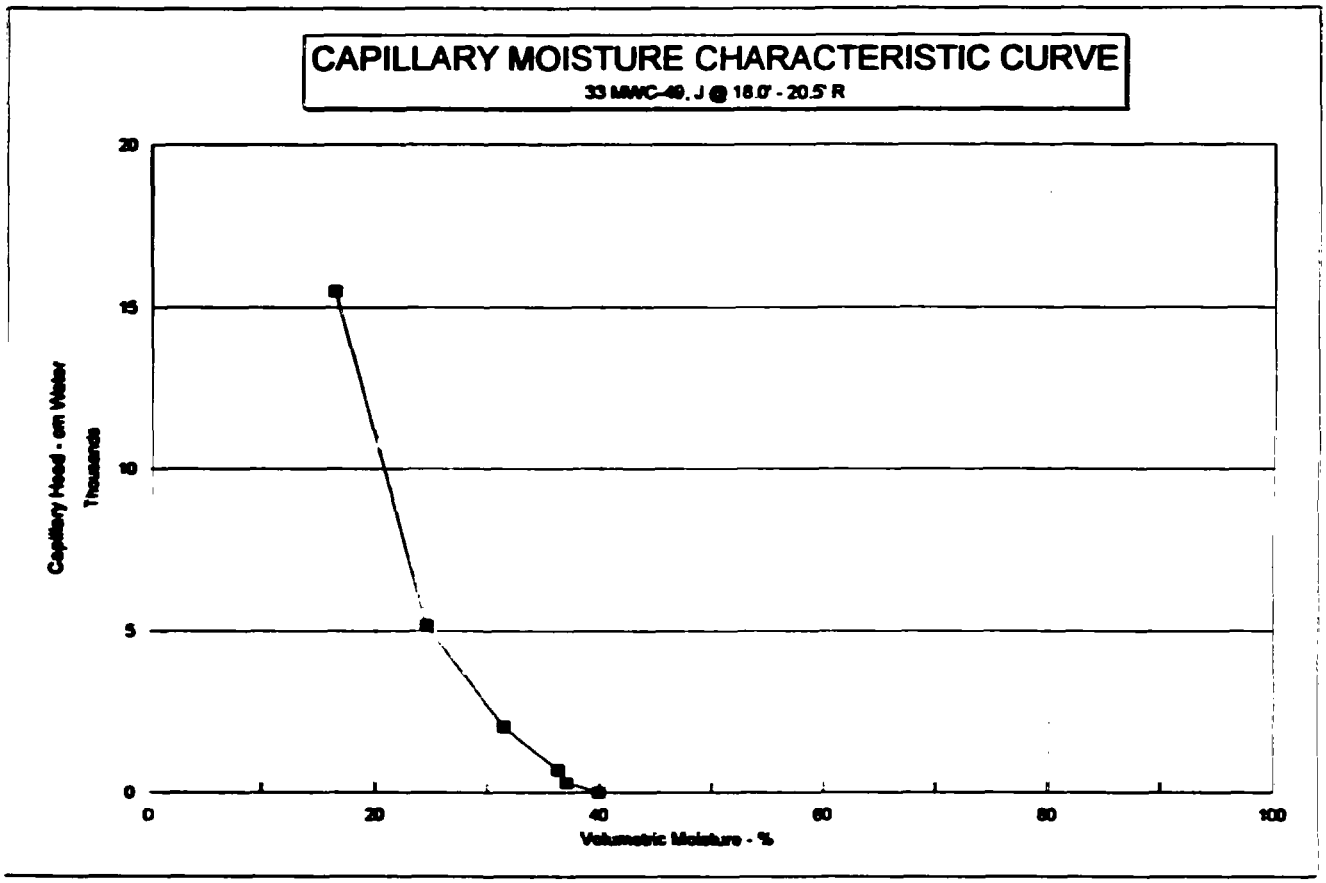
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-49, J @ 18.0' - 20.5' R
Capillary Head - cm Water
Thousands
20
15
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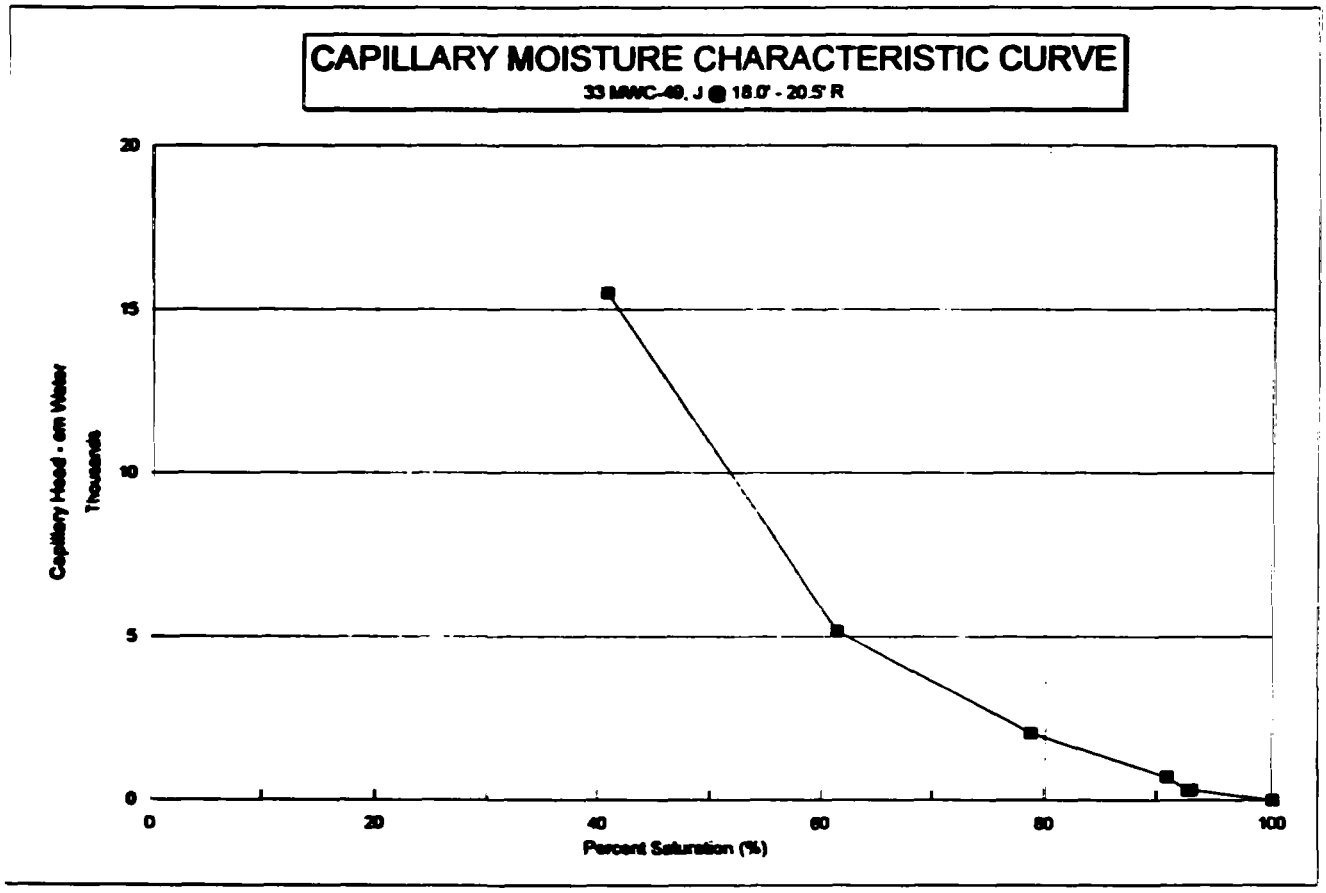
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-49, J @ 18.0' - 20.5' R
Capillary Head - cm Water
Thousands
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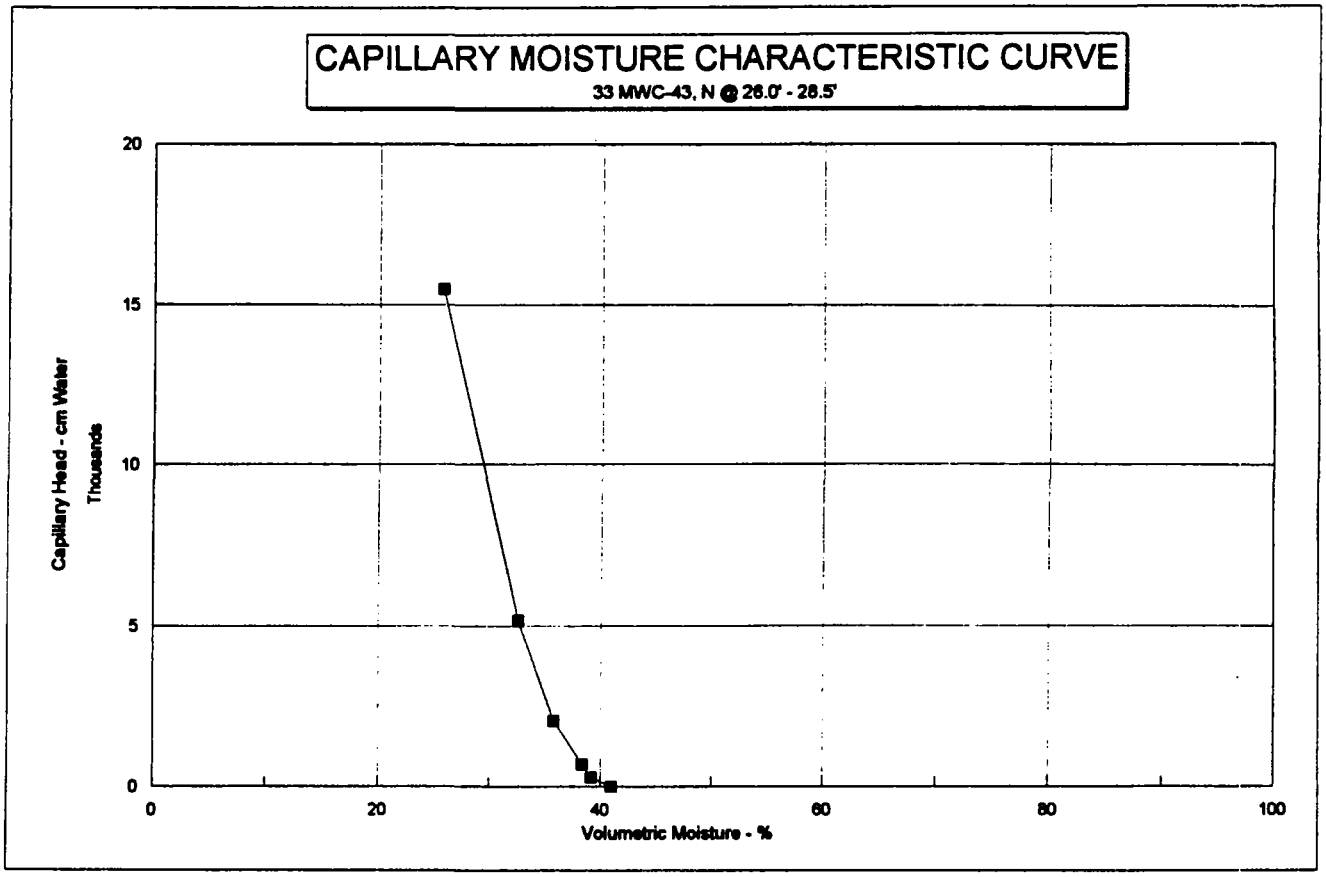
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-43, N @ 26.0' - 28.5'
Capillary Head - cm Water
Thousands
20
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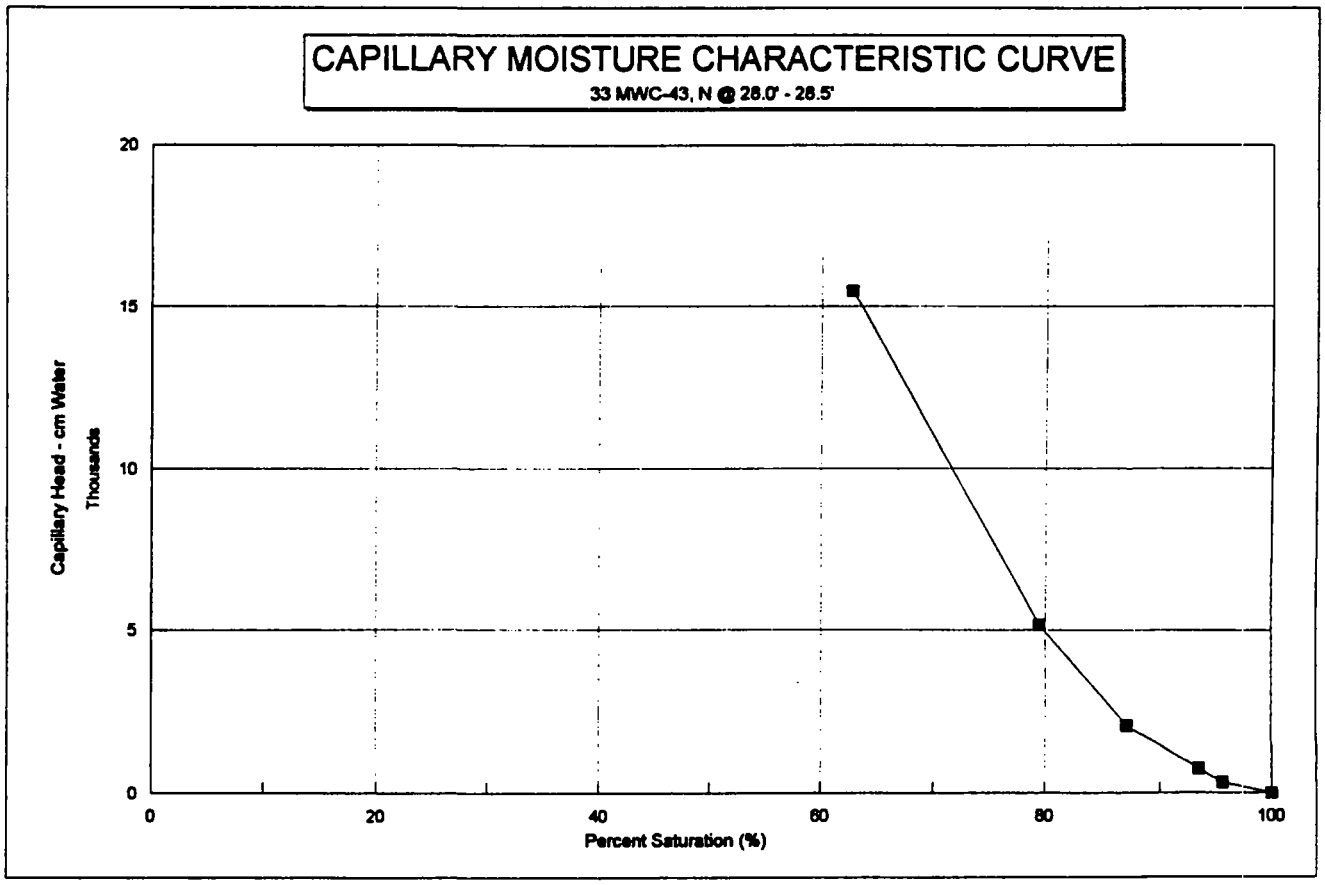
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-43, N @ 26.0' - 28.5'
Capillary Head - cm Water
Thousands
20
15
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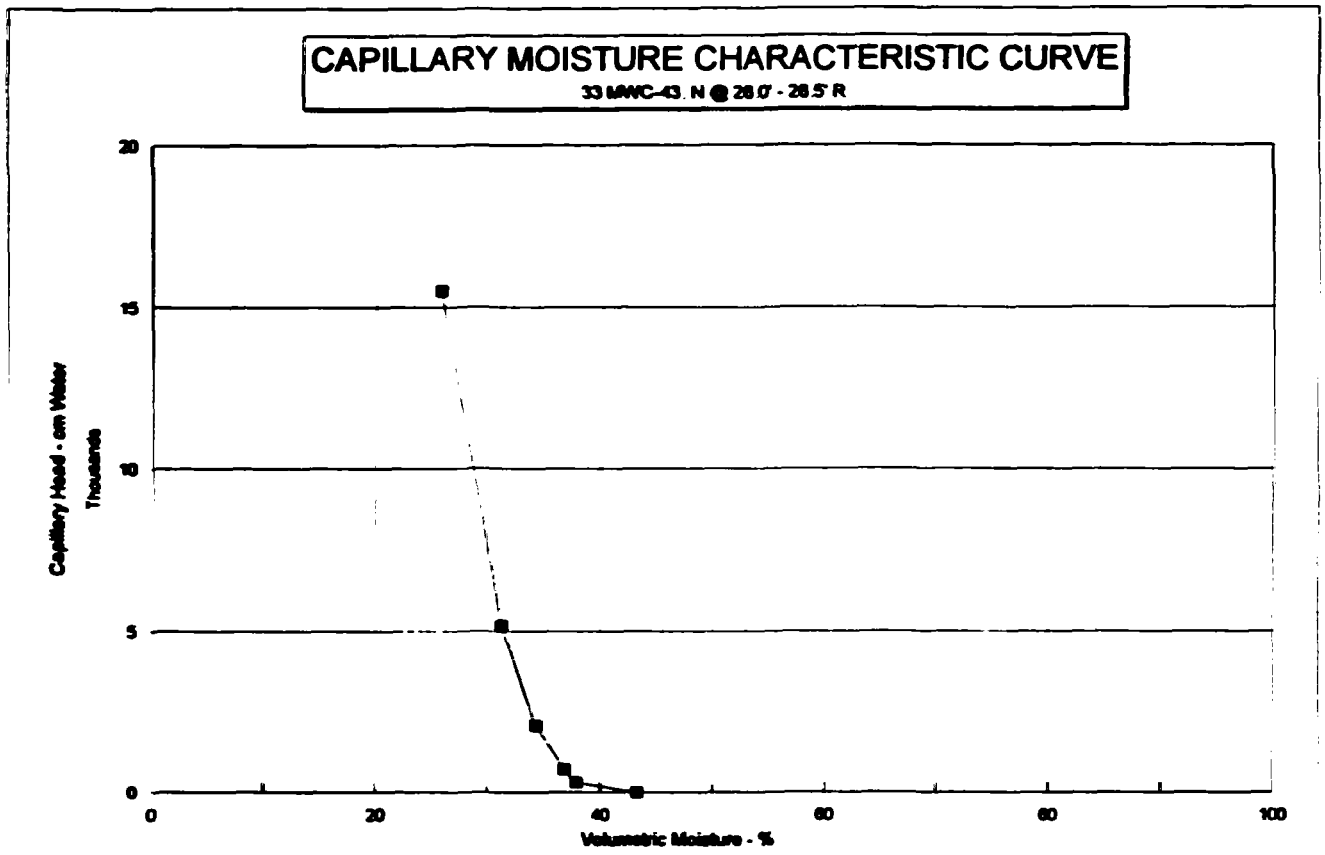
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-43, N @ 26.0' - 28.5' R
Capillary Head - cm Water
Thousands
20
15
10
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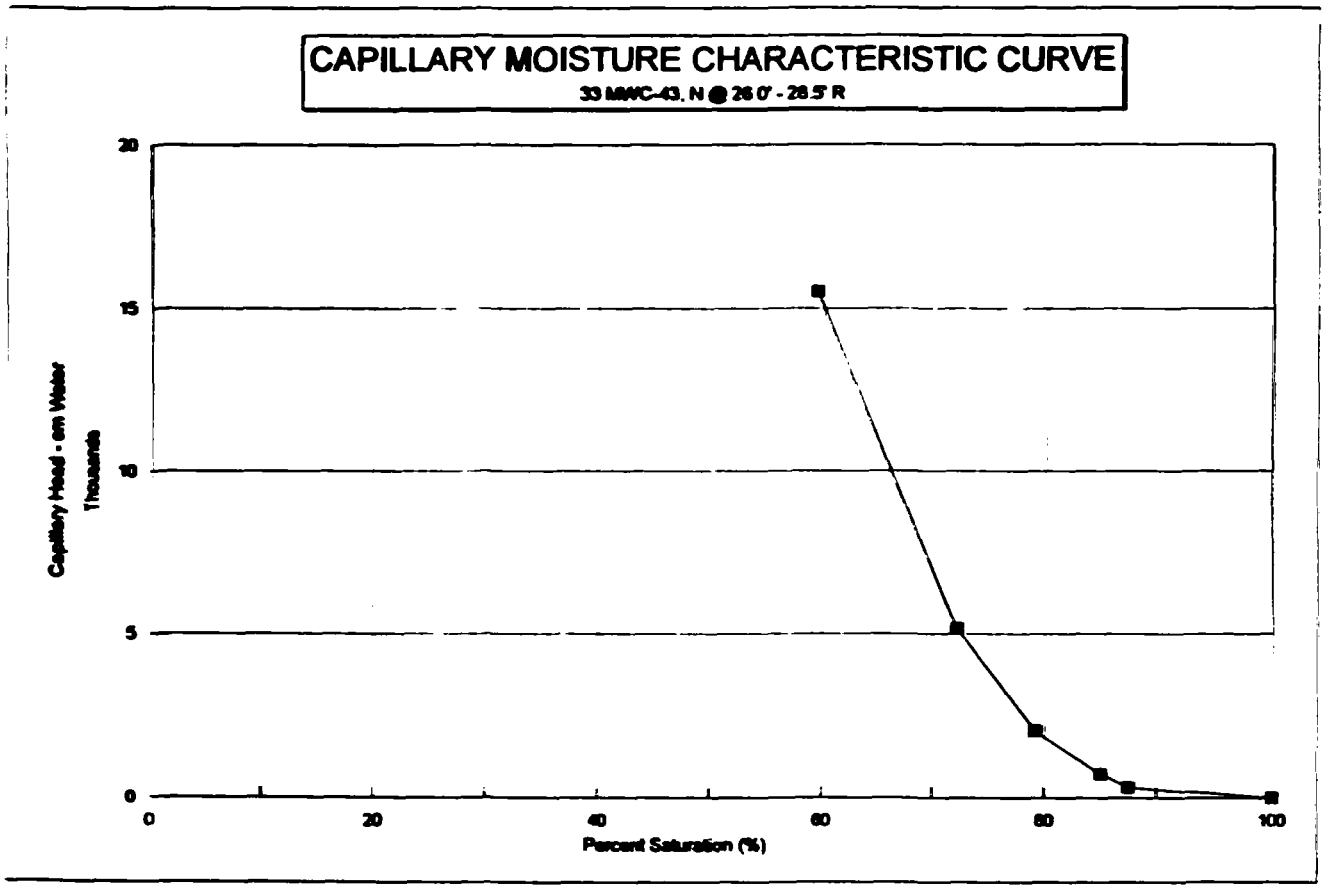
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-43, N @ 26.0' - 28.5' R
Capillary Head - cm Water
Thousands
20
15
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0
20
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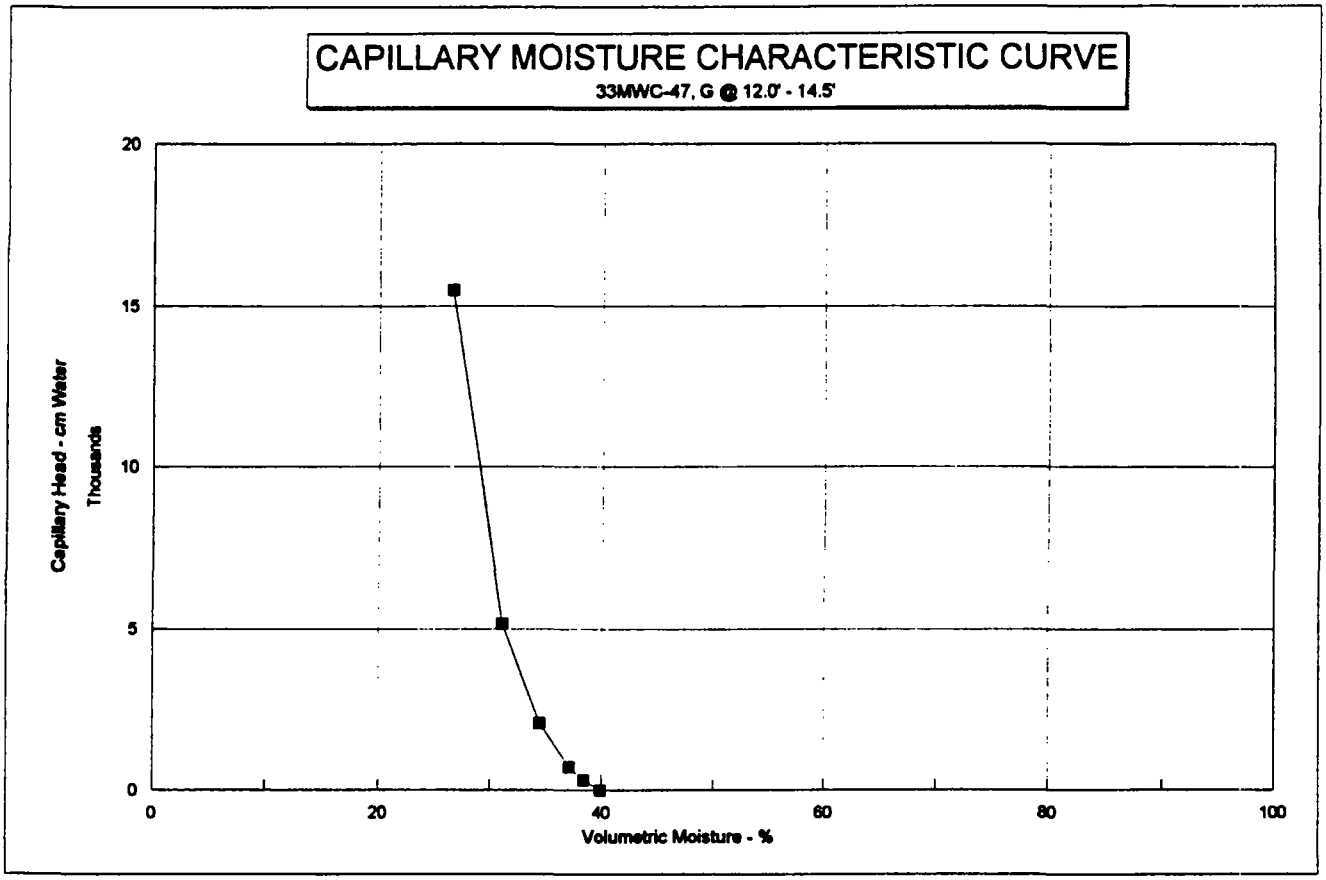
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-47, G @ 12.0' - 14.5'
Capillary Head - cm Water
Thousands
20
15
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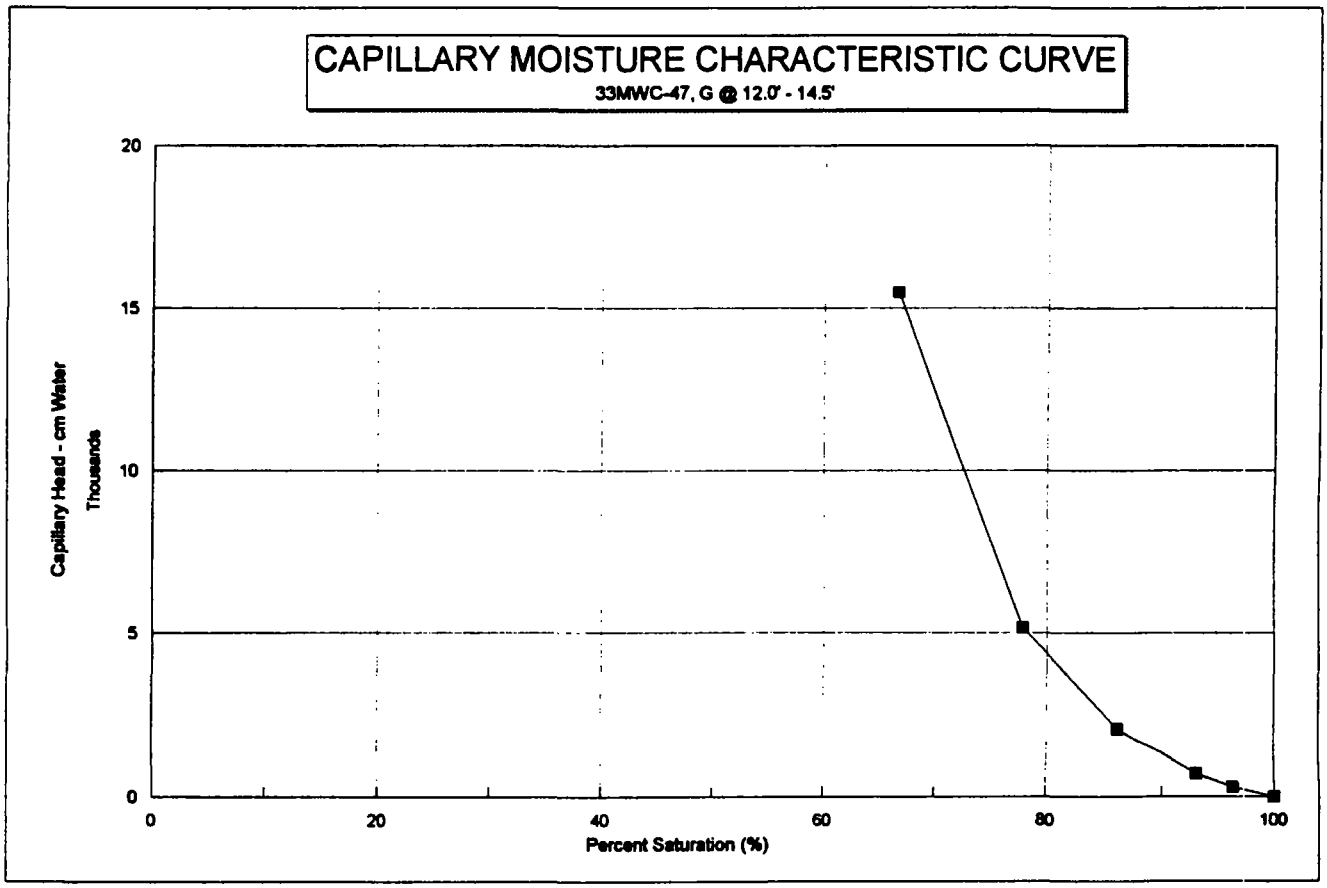
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-47, G @ 12.0' - 14.5'
Capillary Head - cm Water
Thousands
20
15
10
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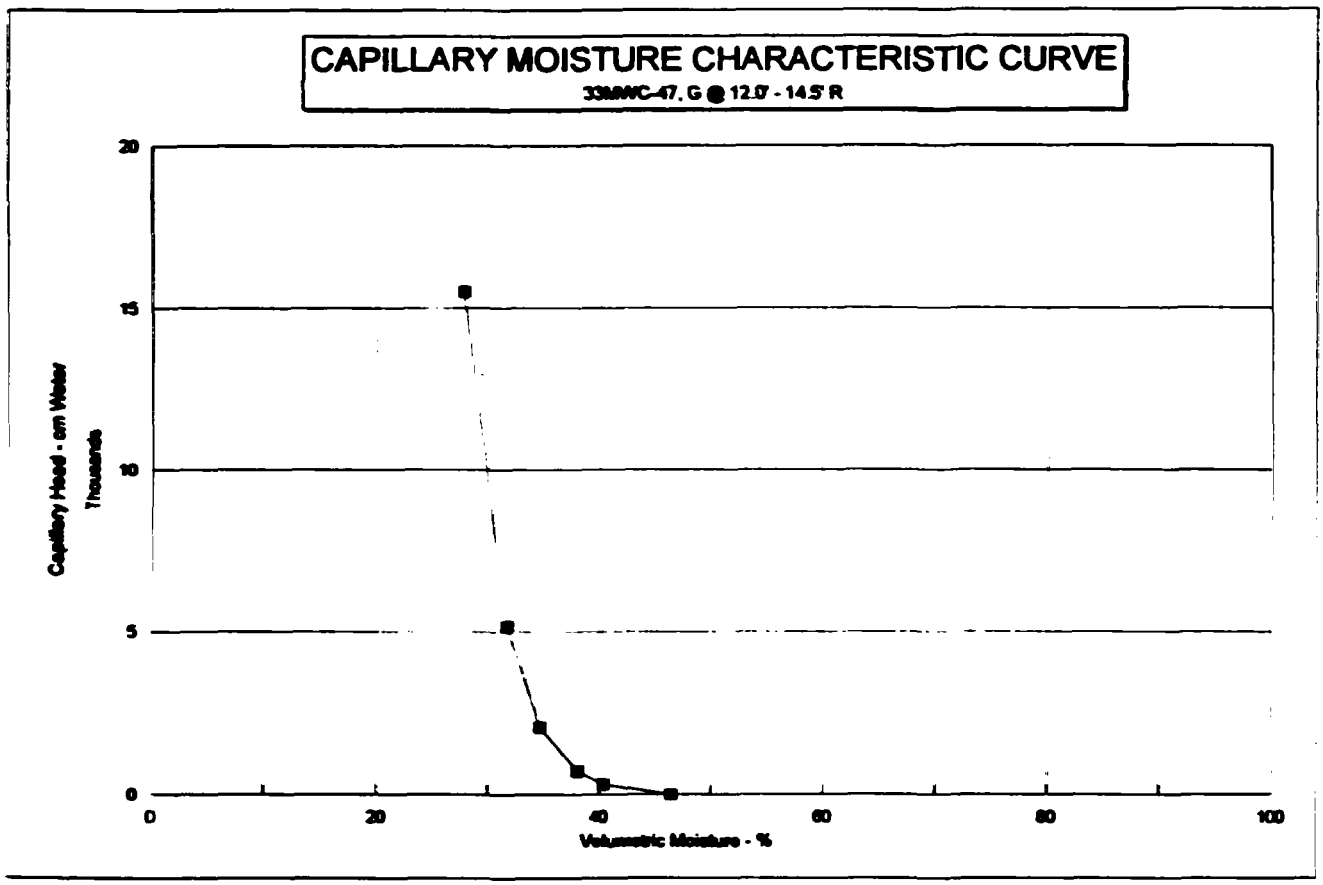
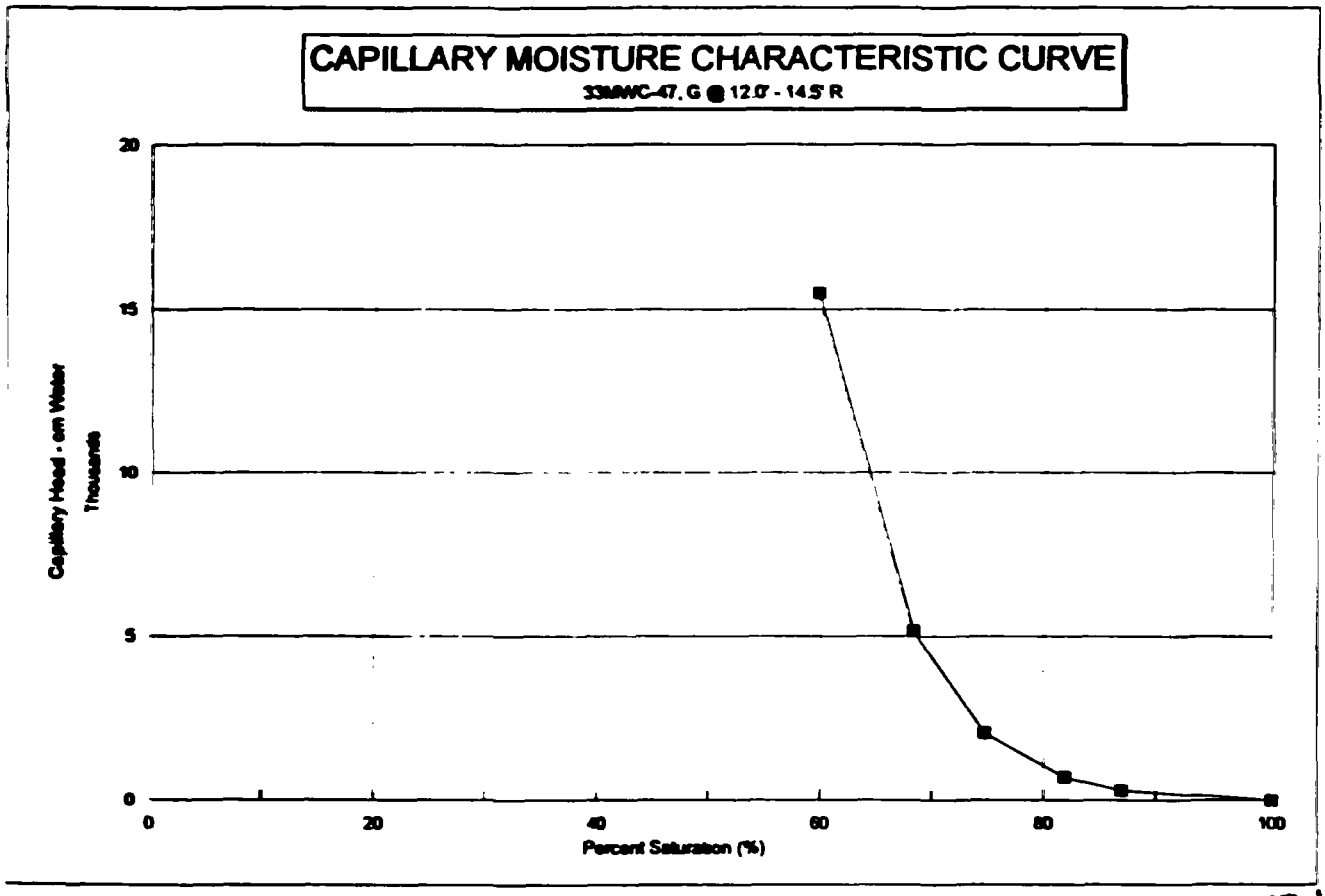
0
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-47, G @ 12.0' - 14.5' R
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-47, G @ 12.0' - 14.5' R
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Percent Saturation (%)

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT RMT Inc.

JOB NO. 2473-02

SAMPLE DATE

SOIL DESCR. Job # 4781.06

LOCATION Crab Orchard NWR

TEST STARTED 11/10/00 CL/DPM

TEST FINISHED 1/8/01 DPM

MASS DATA

Sample Description	Ring Mass g	As Rec. Mass Sample & Ring g	Sat. Mass Filter & Ring g	0.3 Bar Mass g	0.7 Bar Mass g	2 Bar Mass g	5 Bar Mass g	15 Bar Mass g	Dry Mass Filter, Ring, & Dish g	Dish Wt. g
Filter Mass g		0.224	0.655	0.384	0.318	0.310	0.298	0.280		
33MWC-45 @10.0' - 12.5'	10.643	49.300	50.691	49.669	49.381	48.410	47.419	46.403	43.023	0.994
33MWC-45 @10.0' - 12.5' R	10.677	48.430	50.083	48.685	48.321	47.345	46.287	45.205	41.744	0.978
33 MWC-49, R @ 34.0' - 36.5'	10.737	50.041	50.824	49.053	48.374	47.331	46.703	45.670	46.438	2.335
33 MWC-49, R @ 34.0' - 36.5' R	10.638	49.338	50.676	48.500	47.967	47.236	46.394	45.196	45.123	2.348

Data Entered By: MC Date: 01/15/2001

Data Checked By: DPM Date: 01/15/01

Filename: RCK03349

ADVANCED TERRA TESTING, INC.

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CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	RMT Inc.	JOB NO.	2473-02
SAMPLE DATE		TEST STARTED	11/10/00 CL/DPM
SOIL DESCR.	Job # 4781.06	TEST FINISHED	1/8/01 DPM
LOCATION	Crab Orchard NWR		

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	Sample Conditions						0.3 Bar		
	Dry Mass (g)	Unit Wt. (g/cc)	Sat. Mass (g)	Total H2O (g)	Sat. M.C. % D.M.	Sat. M.C. % Vol.	Retained H2O	% DM	% Vol.
33MWC-45 @ 10.0' - 12.5'	31.162	1.612	39.393	8.231	26.414	42.569	7.460	24.004	38.685
33MWC-45 @ 10.0' - 12.5' R	29.865	1.545	38.751	8.886	29.754	45.957	7.759	25.980	40.128
33 MWC-49, R @ 34.0' - 36.5'	33.142	1.714	39.432	6.290	18.979	32.531	4.790	14.453	24.773
33 MWC-49, R @ 34.0' - 36.5' R	31.913	1.850	39.383	7.470	23.407	38.633	5.565	17.438	28.781

Data Entered By: MC Date: 01/15/2001
Data Checked By: Date: 01/15/01
Filename: RCK03349

ADVANCED TERRA TESTING, INC.

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT	RMT Inc.	JOB NO.	2473-02
SAMPLE DATE		TEST STARTED	11/10/00 CL/DPM
SOIL DESCR.	Job # 4781.06	TEST FINISHED	1/8/01 DPM
LOCATION	Crab Orchard NWR		

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	0.7 Bar			2.0 Bar			5.0 Bar			15.0 Bar		
	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
33MWC-45 @10.0' - 12.5'	7.258	23.291	37.537	6.295	20.201	32.557	5.316	17.059	27.493	4.318	13.857	22.332
33MWC-45 @10.0' - 12.5' R	7.461	24.982	38.587	6.493	21.741	33.581	5.447	18.239	28.171	4.383	14.676	22.668
33 MWC-49, R @ 34.0' - 36.5'	4.177	12.603	21.603	3.142	9.480	16.250	2.526	7.622	13.064	1.511	4.559	7.815
33 MWC-49, R @ 34.0' - 36.5' R	5.098	15.975	26.366	4.375	13.709	22.627	3.545	11.108	18.334	2.365	7.411	12.231

Data Entered By: MC Date: 01/15/2001
Data Checked By: DMM Date: 01/15/01
Filename: RCK03349

ADVANCED TERRA TESTING, INC.

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CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT RMT Inc.

JOB NO. 2473-02

SAMPLE DATE

SOIL DESCR. Job # 4781.06

LOCATION Crab Orchard NWR

TEST STARTED 11/10/00 CL/DPM

TEST FINISHED 1/8/01 DPM

	Vol. MC % Sat.	Vol. MC % 0.3 Bar	Vol. MC % 0.7 Bar	Vol. MC % 2 Bar	Vol. MC % 5 Bar	Vol. MC % 15 Bar
33MWC-45 @10.0' - 12.5'	42.57	38.69	37.54	32.56	27.49	22.33
33MWC-45 @10.0' - 12.5' R	45.96	40.13	38.59	33.58	28.17	22.67
33 MWC-49, R @ 34.0' - 36.5'	32.53	24.77	21.60	16.25	13.06	7.81
33 MWC-49, R @ 34.0' - 36.5' R	38.63	28.78	26.37	22.63	18.33	12.23

% Saturation

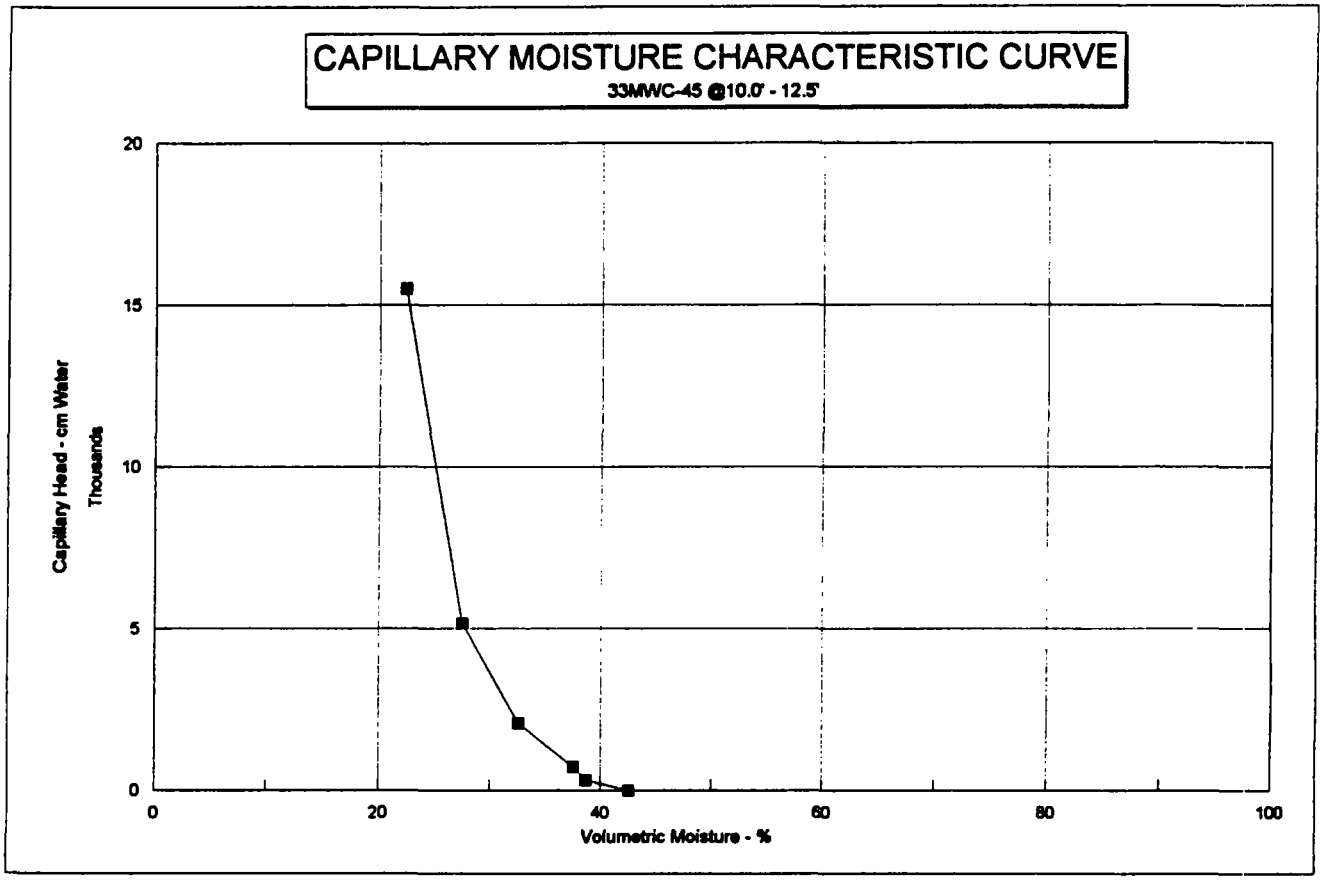
	Sat.	0.3 Bar	0.7 Bar	2 Bar	5 Bar	15 Bar
33MWC-45 @10.0' - 12.5'	100.00	90.88	88.18	76.48	64.59	52.46
33MWC-45 @10.0' - 12.5' R	100.00	87.32	83.96	73.07	61.30	49.32
33 MWC-49, R @ 34.0' - 36.5'	100.00	76.15	66.41	49.95	40.16	24.02
33 MWC-49, R @ 34.0' - 36.5' R	100.00	74.50	68.25	58.57	47.46	31.66

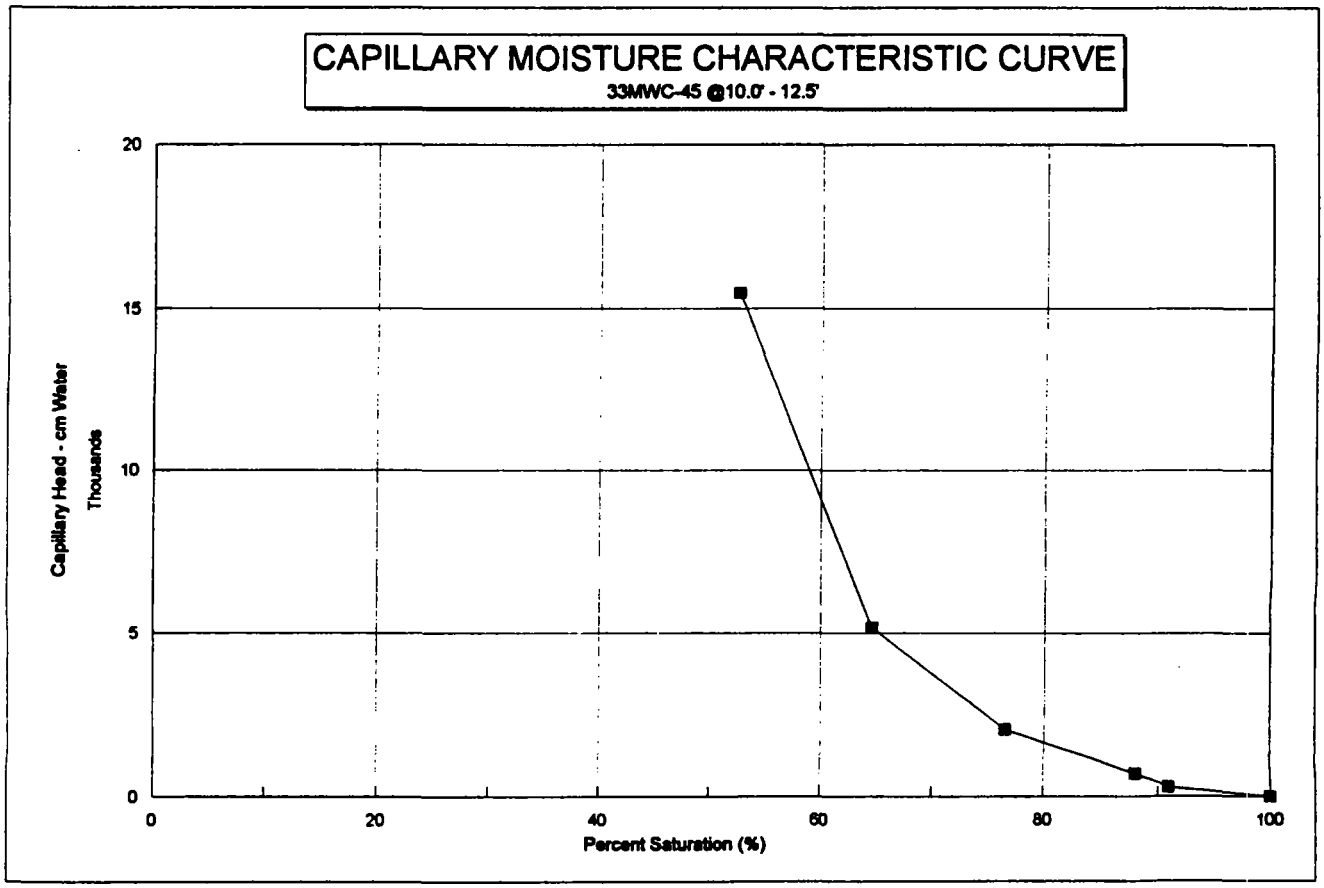
Date Entered By: MC Date: 01/15/2001

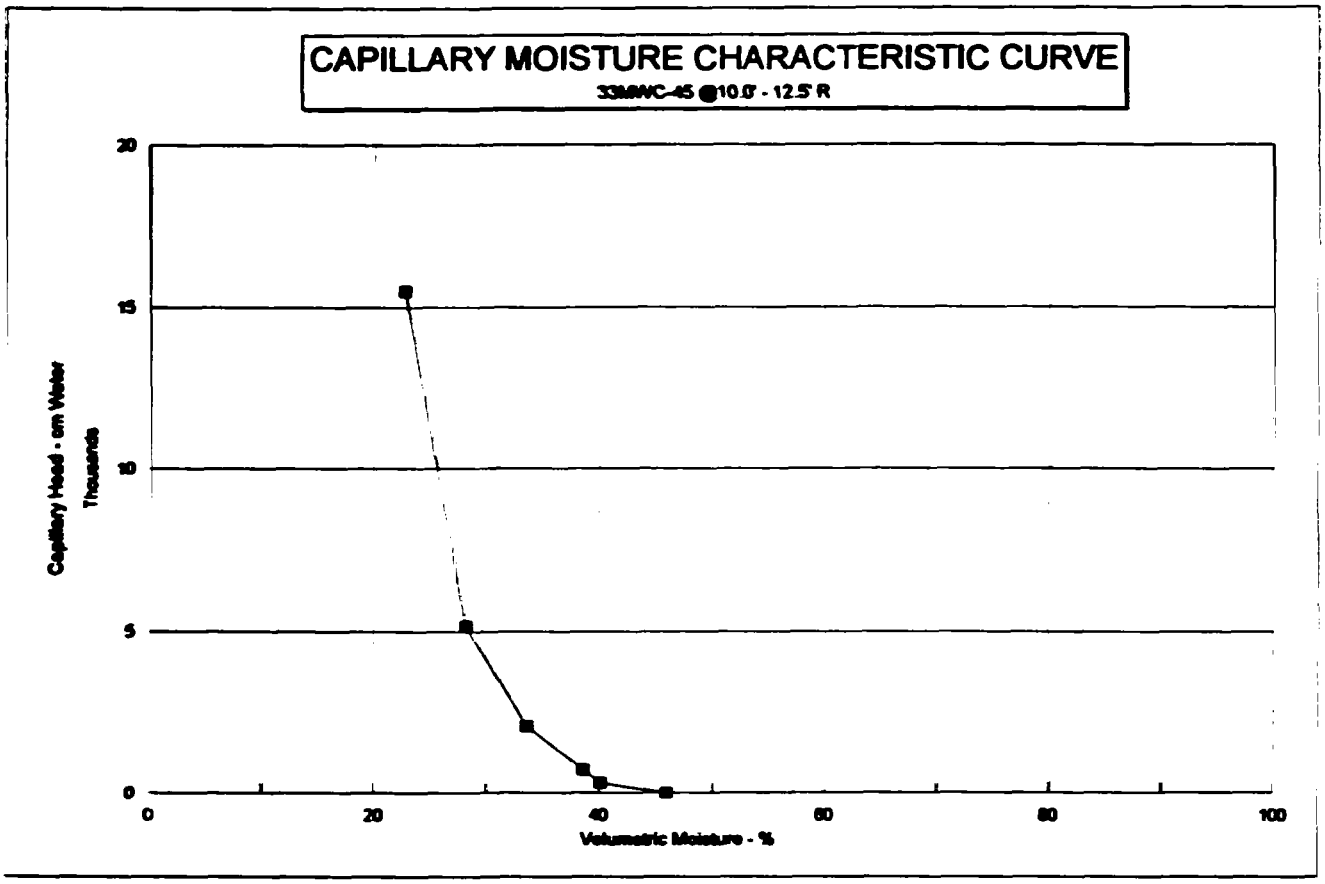
Date Checked By: DPM Date: 01/15/01

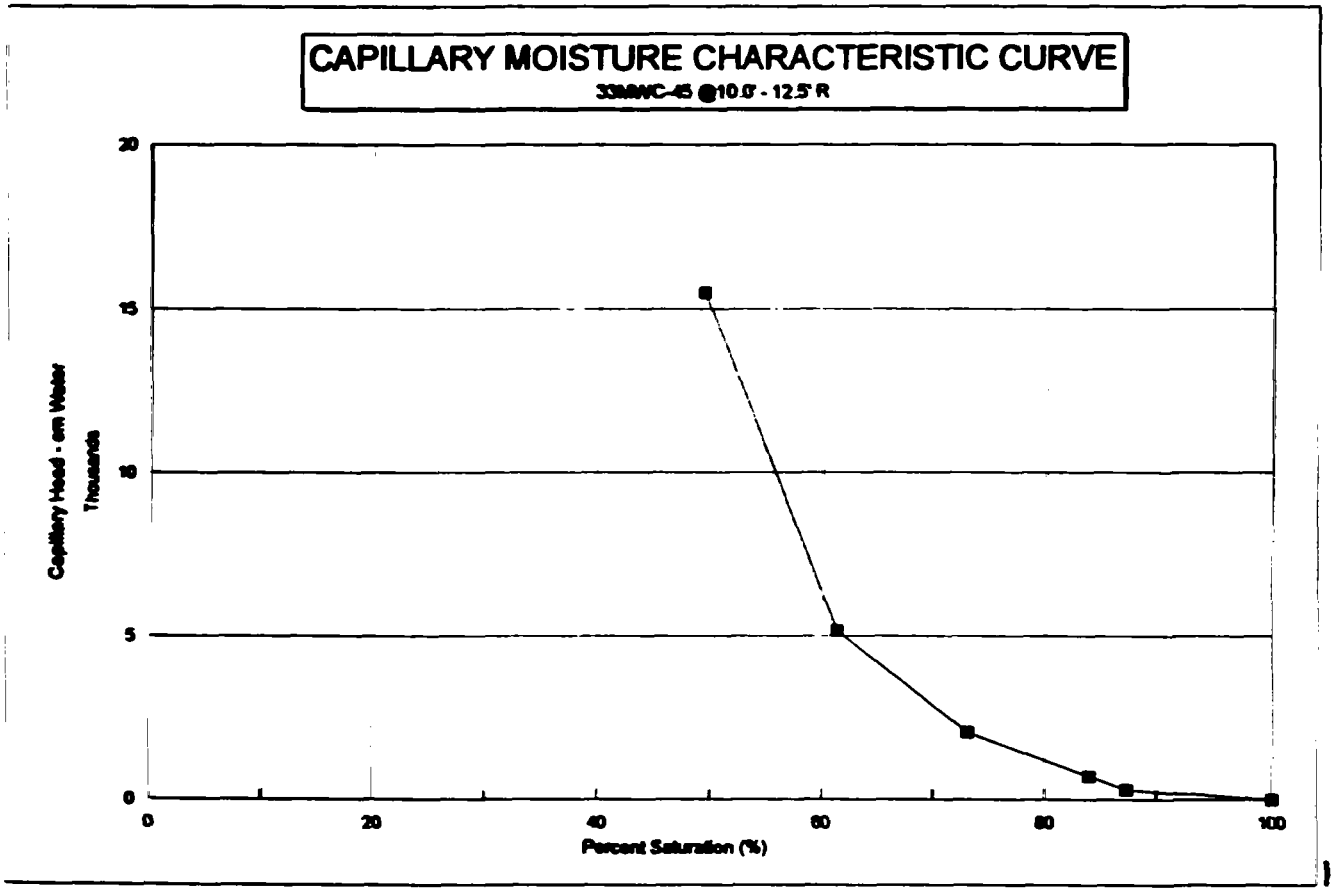
Filename: RCK03349

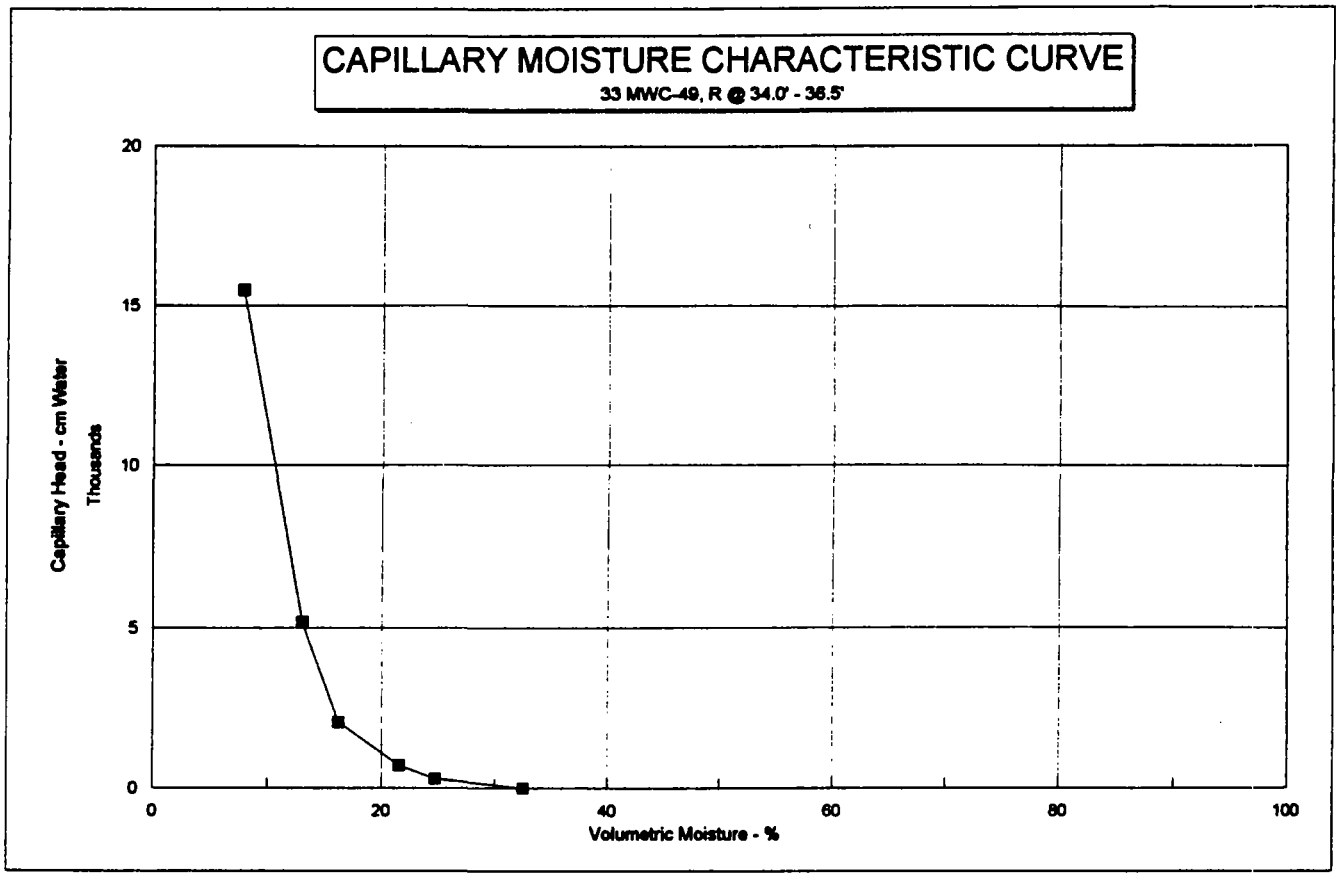
ADVANCED TERRA TESTING, INC.

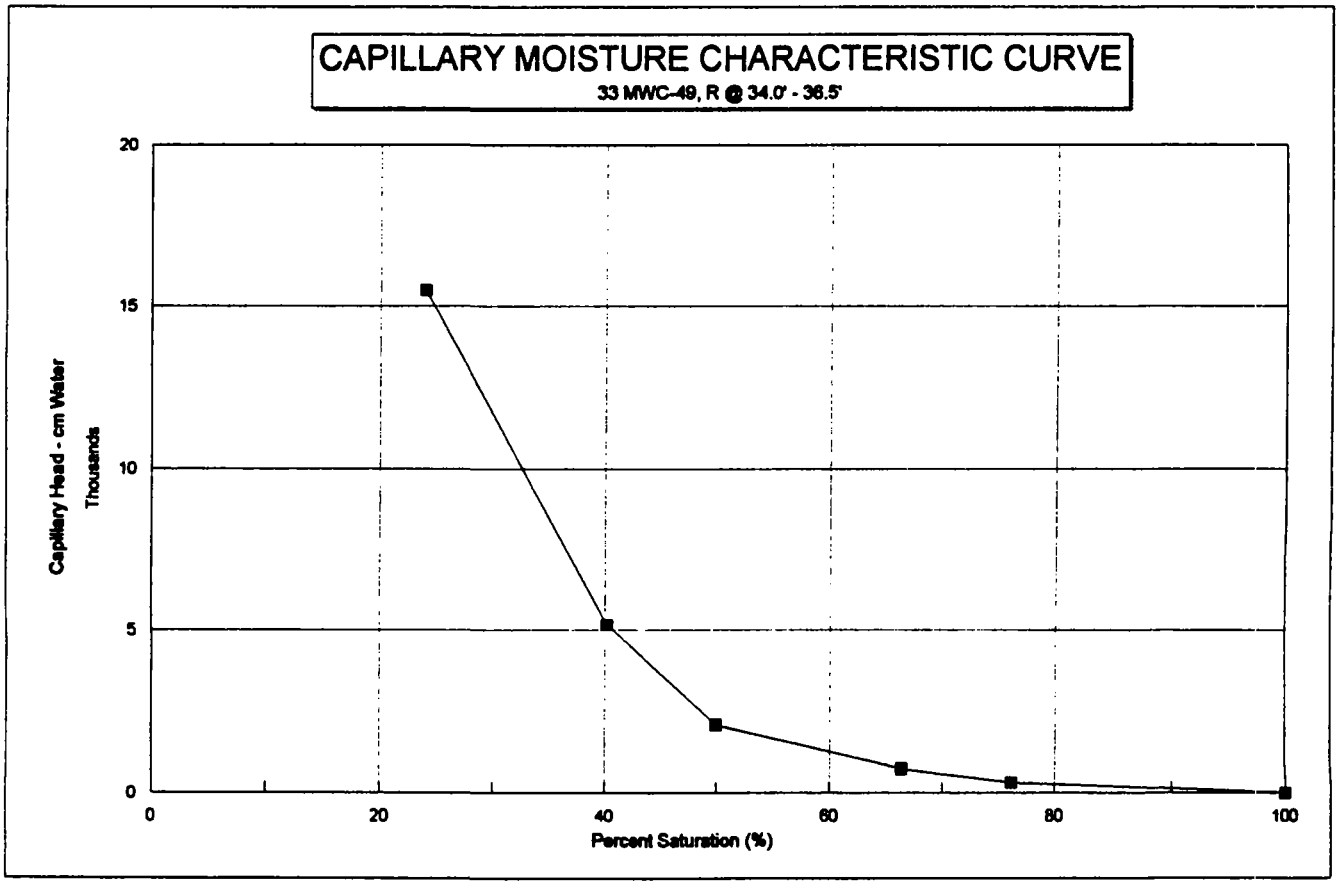

CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-45 @10.0' - 12.5'
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Volumetric Moisture - %

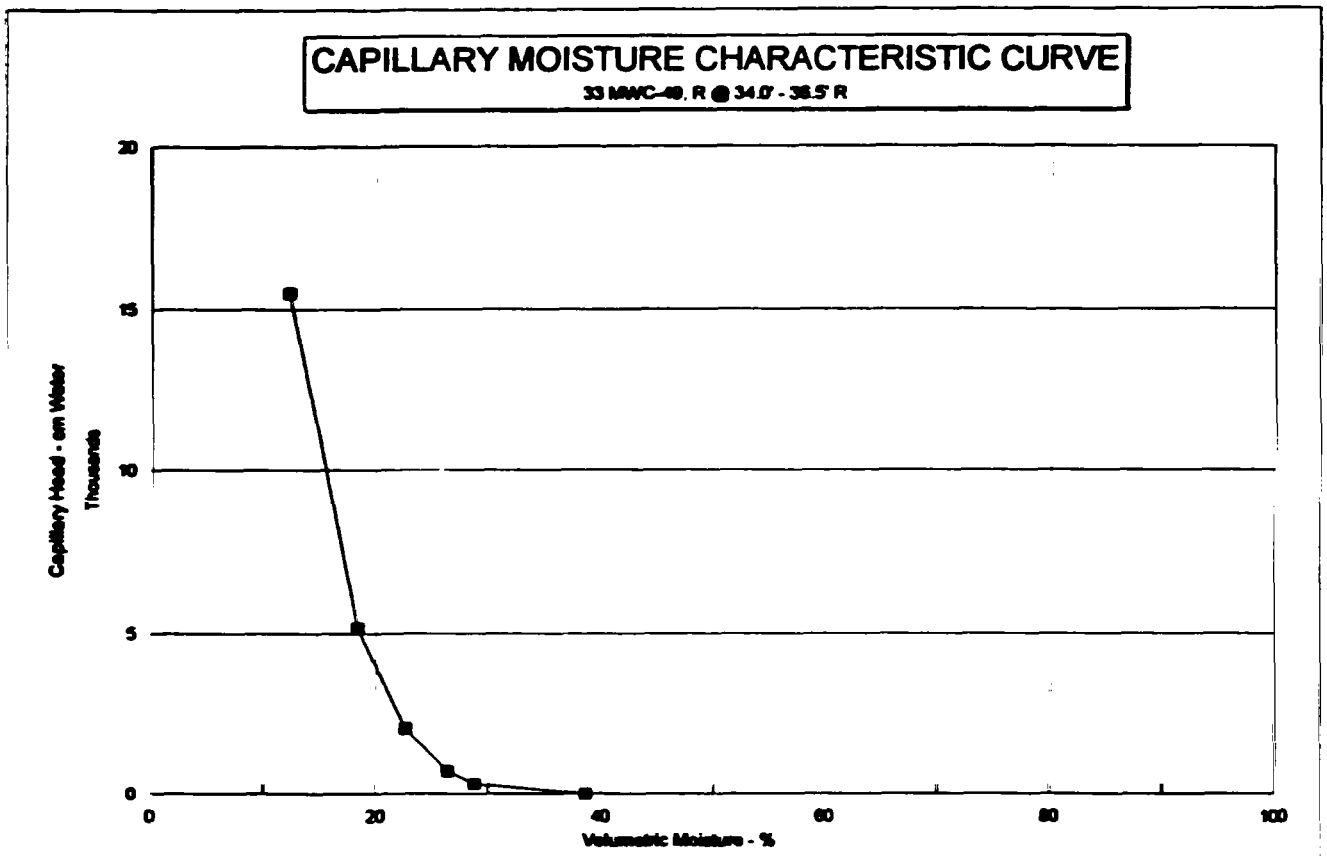

CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-45 @10.0' - 12.5'
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Percent Saturation (%)

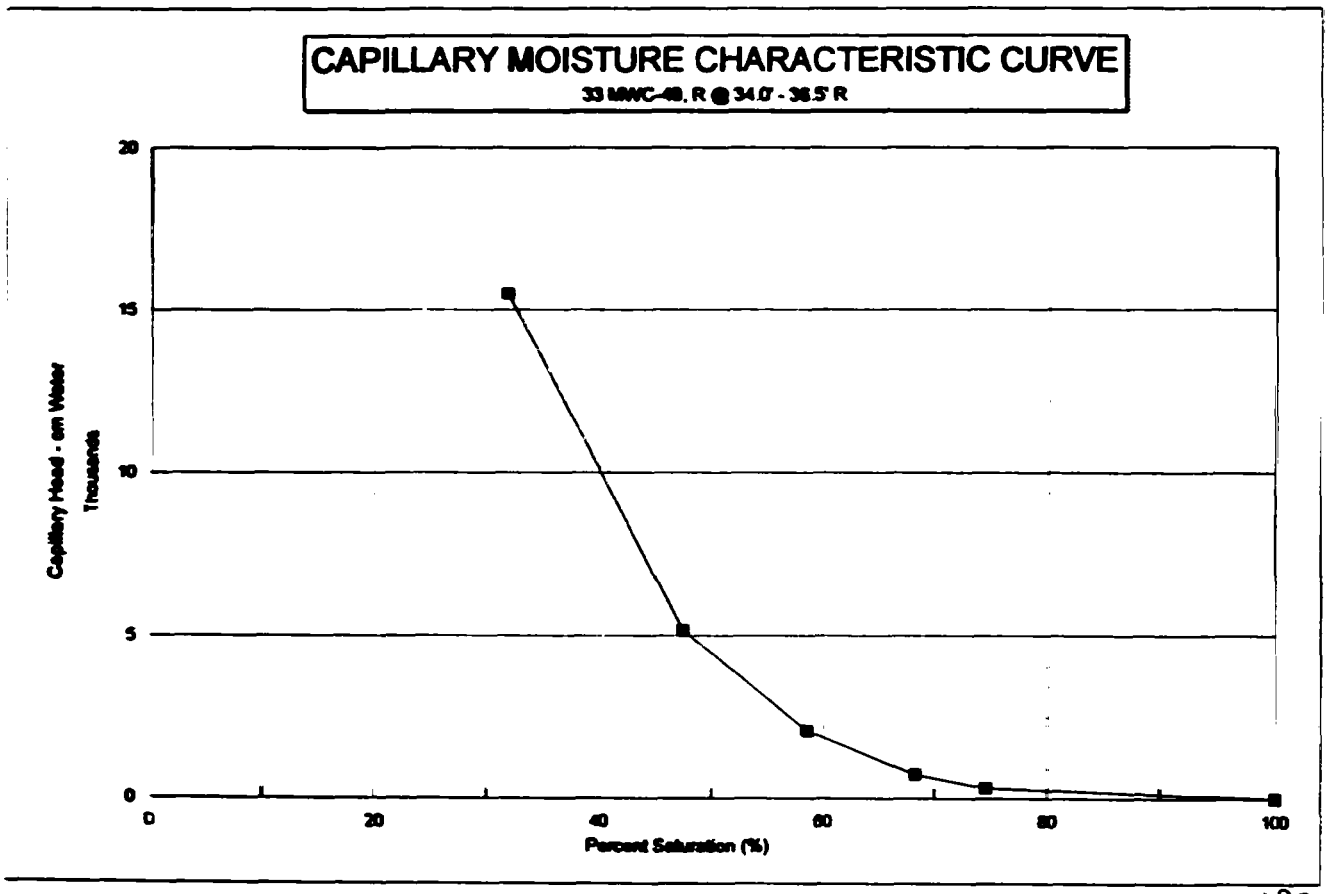

CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-45 @10.0' - 12.5' R
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33MWC-45 @10.0' - 12.5' R
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-49, R @ 34.0' - 36.5'
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-49, R @ 34.0' - 36.5'
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-49, R @ 34.0' - 36.5' R
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
33 MWC-49, R @ 34.0' - 36.5' R
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Percent Saturation (%)

TRIAXIAL, BACK PRESSURE
PERMEABILITY/COMPATIBILITY TESTING
TX/PBP
ASTM D 5084

PERMEABILITY TEST - BACK PRESSURE SATURATED - FLOW PUMP METHOD
ASTM D 5084

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-45	SAMPLED	
DEPTH		TEST STARTED	10/24/00 CL
SAMPLE NO.	X	TEST FINISHED	10/27/00 CL
SOIL DESCR.	#4781.06	CELL NUMBER	20S
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

MOISTURE/DENSITY DATA	BEFORE TEST	AFTER TEST
Wt. Soil + Moisture (g)	527.1	523.3
Wt. Wet Soil & Pan (g)	535.3	531.5
Wt. Dry Soil & Pan (g)	451.0	451.0
Wt. Lost Moisture (g)	84.3	80.4
Wt. of Pan Only (g)	8.2	8.2
Wt. of Dry Soil (g)	442.8	442.8
Moisture Content %	19.0	18.2
Wet Density PCF	132.8	133.6
Dry Density PCF	111.6	113.1

Init. Diameter (in)	2.410	(cm)	6.121
Init. Area (sq in)	4.562	(sq cm)	29.432
Init. Height (in)	3.315	(cm)	8.420
Vol. Bef. Consol. (cu ft)	0.00875		
Vol. After Consol. (cu ft)	0.00863		
Porosity %	32.90		

FLOW PUMP CALCULATIONS

Pump Setting	9
Velocity CM/Sec	5.91E-05
Q (cc/s)	1.89E-06
Height	3.255
Diameter	2.416
Pressure (psi)	1.190
Area after consol. (cm*cm)	29.567
Gradient	10.120
Permeability k (cm/s)	6.3E-09
Back Pressure (psi)	48.0
Cell Pressure (psi)	73.0
Ave. Effective Stress (psi)	24.405

Data entry by: MC Date: 01/09/2001
Checked by: CL Date: 01/15/01
FileName: RCP0C45X

ADVANCED TERRA TESTING, INC.

TRIAXAL COMPRESSION TEST DATA

CLIENT	RMT Inc.	JOB NO.	2473-02
BORING NO.	33MWC-45	SAMPLED	
DEPTH		TEST STARTED	10/24/00 CL
SAMPLE NO.	X	TEST FINISHED	10/27/00 CL
SOIL DESCR.	#4781.06	SETUP NO.	20S
LOCATION	Crab Orchard NWR	SATURATED TEST	Yes
CONF. PRES. PSF	3600	TEST TYPE	TX/Pbp

SATURATION DATA

Cell Pres. (PSI)	Back Pres. (PSI)	Burette Reading (CC)		Pore Pressure (PSI)		Change	B
		Close	Open	Close	Open		
40.0	38.0	1.6	10.2				
50.0	48.0	10.8	12.5	39.1	48.4	9.3	0.93
60.0		12.8	13.1	49.1	58.7	9.6	0.96

CONSOLIDATION DATA

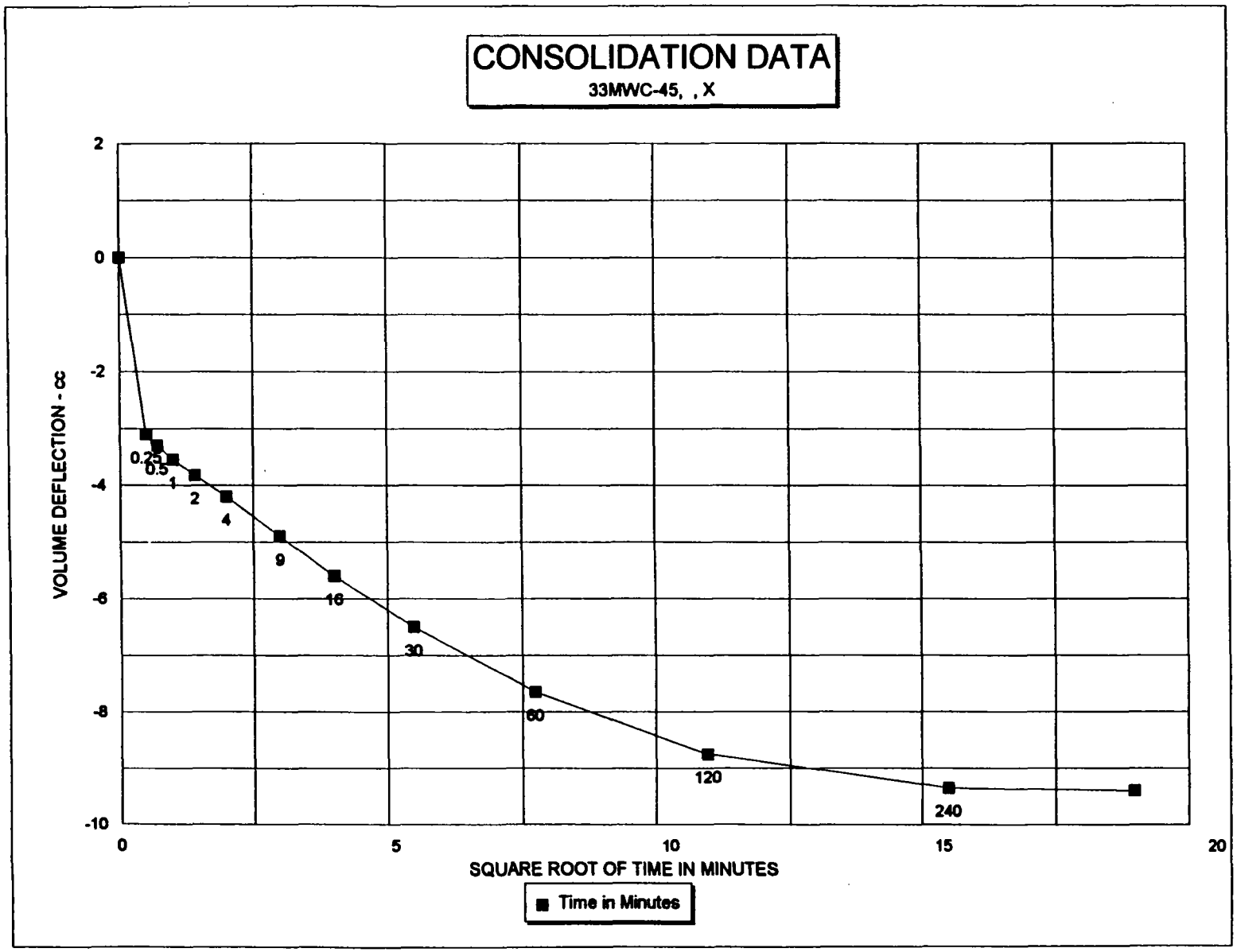
Elapsed Time (Min)	SQRT Time (Min)	Burette Reading (CC)	Volume Defl. (cc)
0.00	0.00	13.10	0.00
0.25	0.50	16.20	-3.10
0.5	0.71	16.40	-3.30
1	1.00	16.65	-3.55
2	1.41	16.93	-3.82
4	2.00	17.30	-4.20
9	3.00	18.00	-4.90
16	4.00	18.70	-5.60
30	5.48	19.60	-6.50
60	7.75	20.75	-7.65
120	10.95	21.85	-8.75
240	15.49	22.45	-9.35
360	18.97	22.50	-9.40

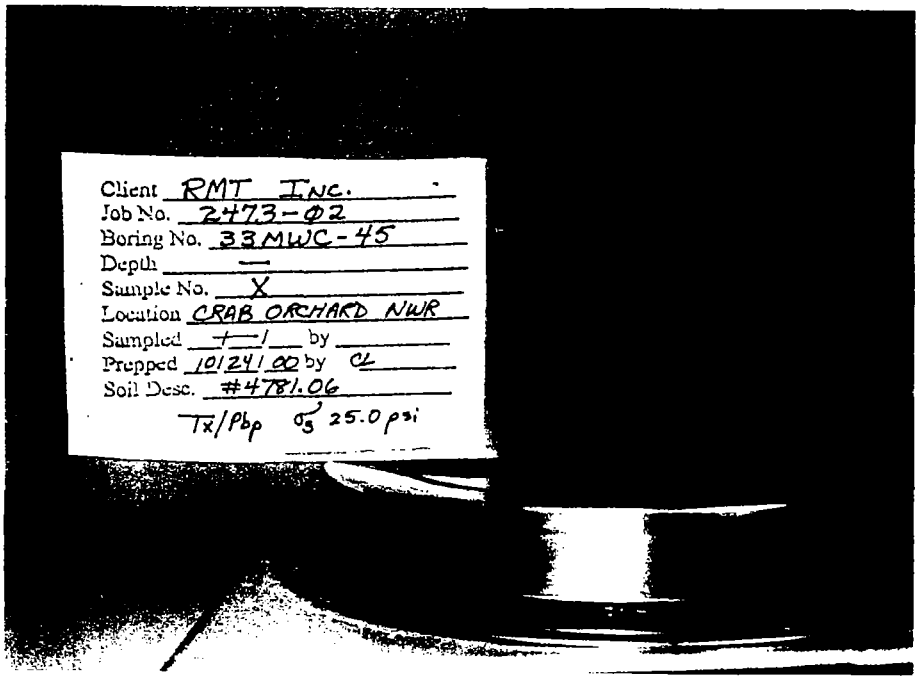
Initial Height (in)	3.315	Init. Vol. (CC)	247.85
Height Change (in)	0.060	Vol. Change (CC)	21.60
Ht. After Cons. (in)	3.255	Cell Exp. (CC)	18.25
Initial Area (sq in)	4.562	Net Change (CC)	3.35
Area After Cons. (sq in)	4.583	Cons. Vol. (CC)	244.50

Data entry by: MC Date: 01/09/2001
Checked by: CL Date: 01/15/01
FileName: RCP0C45X

ADVANCED TERRA TESTING, INC.

186


CONSOLIDATION DATA
33MWC-45, , X
VOLUME DEFLECTION - cc
2
0
-2
-4
-6
-8
-10
0
5
10
15
20
SQUARE ROOT OF TIME IN MINUTES
0.25
0.5
1
2
4
9
16
30
60
120
240
Time in Minutes



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10/30/00

CAPILLARY MOISTURE RETENTION TEST

ASTM D 3152

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT RMT Inc.

JOB NO. 2473-01

SAMPLE DATE

SOIL DESCR. Job # 4781.06

LOCATION Crab Orchard NWR

TEST STARTED 11/10/00 CL/DPM

TEST FINISHED 1/8/01 DPM

MASS DATA

Sample Description	Ring Mass g	As Rec. Mass Samp & Ring g	Sat. Mass Filter & Ring g	0.3 Bar Mass g	0.7 Bar Mass g	2 Bar Mass g	5 Bar Mass g	15 Bar Mass g	Dry Mass Filter, Ring, & Dish g	Dish Wt. g
Filter Mass g		0.224	0.655	0.384	0.318	0.310	0.298	0.280		
I-1-23 SVE @ 5.25' - 7.25'	10.616	47.946	49.569	48.186	47.665	46.917	46.330	44.814	42.365	2.305
I-1-23 SVE @ 5.25' - 7.25' R	10.697	46.487	48.389	46.753	46.236	45.380	44.695	43.040	40.718	2.351
I-1-2 SVE @ 6.0' - 8.0'	10.636	50.241	51.459	50.254	49.907	49.284	48.565	47.680	44.564	0.974
I-1-2 SVE @ 6.0' - 8.0' R	10.477	50.000	50.909	50.271	49.938	49.395	48.823	47.983	44.554	0.991
I-1-23 UC @ 14.0' - 16.0'	10.661	49.627	50.741	50.011	49.679	48.590	47.696	46.343	44.960	2.296
I-1-23 UC @ 14.0' - 16.0' R	10.715	49.761	52.657	50.578	50.118	49.480	48.962	47.585	45.204	2.366
Repository MPE-UC2 @ 45.0' - 47.5'	10.557	51.151	52.007	51.439	51.258	50.856	50.383	48.580	46.961	2.312
Repository MPE-UC2 @ 45.0' - 47.5' R	10.607	50.724	51.847	50.956	50.715	50.279	49.807	47.933	46.388	2.340
Repository MPE-UC1 @ 39.0' - 40.5'	10.654	49.248	50.900	49.578	49.233	48.700	48.094	45.147	43.687	2.302
Repository MPE-UC1 @ 39.0' - 40.5' R	10.422	48.502	49.525	48.783	48.488	47.937	47.340	45.245	42.803	2.293
I-1-23 US @ 32.0' - 34.5'	10.703	51.536	52.525	48.878	48.084	47.399	46.997	46.539	48.126	2.299
I-1-23 US @ 32.0' - 34.5' R	10.563	50.140	51.031	46.905	46.497	45.683	45.350	44.855	46.470	2.307
Repository MPE-US @ 30.5' - 32.5'	10.705	50.462	51.427	49.936	48.995	47.794	47.267	46.450	47.022	2.341
Repository MPE-US @ 30.5' - 32.5' R	10.562	49.537	51.453	47.908	47.698	45.943	45.697	44.836	45.860	2.305

Data Entered By: MC Date: 01/15/2001

Data Checked By: DPM Date: 1/17/01

Filename: RCK01235

ADVANCED TERRA TESTING, INC.

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CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT: RMT Inc.

JOB NO.: 2473-01

SAMPLE DATE:

SOIL DESCR.: Job # 4781.06

LOCATION: Crab Orchard NWR

TEST STARTED: 11/10/00 CL/DPM

TEST FINISHED: 1/8/01 DPM

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	Sample Conditions							0.3 Bar	
	Dry Mass (g)	Unit Wt. (g/cc)	Sat. Mass (g)	Total H2O (g)	Sat. M.C. % D.M.	Sat. M.C. % Vol.	Retained H2O	% DM	% Vol.
I-1-23 SVE @ 5.25' - 7.25'	29.220	1.511	38.298	9.078	31.088	46.950	7.988	27.262	41.199
I-1-23 SVE @ 5.25' - 7.25' R	27.448	1.419	37.037	9.591	34.945	49.603	8.226	29.972	42.543
I-1-2 SVE @ 6.0' - 8.0'	32.730	1.693	40.168	7.438	22.725	38.468	6.504	19.872	33.637
I-1-2 SVE @ 6.0' - 8.0' R	32.862	1.700	39.777	6.915	21.043	35.763	6.548	19.926	33.865
I-1-23 UC @ 14.0' - 16.0'	31.779	1.644	39.425	7.646	24.060	39.544	7.187	22.616	37.170
I-1-23 UC @ 14.0' - 16.0' R	31.699	1.650	41.267	9.368	29.430	46.553	7.580	23.763	39.202
Repository MPE-UC2 @ 45.0' - 47.5'	33.868	1.752	40.795	6.927	20.453	35.825	6.630	19.576	34.289
Repository MPE-UC2 @ 45.0' - 47.5' R	33.217	1.716	40.585	7.368	22.181	38.108	6.748	20.315	34.899
Repository MPE-UC1 @ 39.0' - 40.5'	30.507	1.578	39.591	9.084	29.777	46.981	8.033	26.332	41.545
Repository MPE-UC1 @ 39.0' - 40.5' R	29.864	1.545	38.448	8.584	28.744	44.395	8.113	27.166	41.959
I-1-23 US @ 32.0' - 34.5'	34.900	1.805	41.167	6.267	17.957	32.412	2.891	8.284	14.952
I-1-23 US @ 32.0' - 34.5' R	33.376	1.726	39.813	6.437	19.288	33.291	2.582	7.736	13.354
Repository MPE-US @ 30.5' - 32.5'	33.752	1.746	40.067	6.315	18.710	32.660	5.095	15.095	26.350
Repository MPE-US @ 30.5' - 32.5' R	32.769	1.695	40.236	7.467	22.787	38.618	4.193	12.796	21.685

Data Entered By: MC Date: 01/15/2001

Data Checked By: DPM Date: 01/15/01

Filename: RCK01235

ADVANCED TERRA TESTING, INC.

194

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

CLIENT: RMT Inc.
JOB NO.: 2473-01

SAMPLE DATE:
SOIL DESCR.: Job # 4781.06
LOCATION: Crab Orchard NWR

TEST STARTED: 11/10/00 CL/DPM
TEST FINISHED: 1/8/01 DPM

Moisture Content Data: % D.M. = Moisture Content By Dry Mass; % Vol. = Moisture Content By Volume

Sample Description	0.7 Bar			2.0 Bar			5.0 Bar			15.0 Bar		
	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.	Retained H2O	% DM	% Vol.
I-1-23 SVE @ 5.25' - 7.25'	7.511	25.705	38.845	6.771	23.172	35.018	6.196	21.205	32.045	4.698	16.078	24.297
I-1-23 SVE @ 5.25' - 7.25' R	7.775	28.328	40.211	6.927	25.239	35.825	6.254	22.787	32.344	4.617	16.822	23.878
I-1-2 SVE @ 6.0' - 8.0'	6.223	19.013	32.184	5.608	17.134	29.003	4.901	14.974	25.347	4.034	12.325	20.863
I-1-2 SVE @ 6.0' - 8.0' R	6.281	19.113	32.484	5.746	17.485	29.717	5.186	15.781	26.821	4.364	13.280	22.570
I-1-23 UC @ 14.0' - 16.0'	6.921	21.779	35.794	5.840	18.377	30.203	4.958	15.601	25.642	3.623	11.401	18.737
I-1-23 UC @ 14.0' - 16.0' R	7.186	22.527	37.165	6.556	20.552	33.906	6.050	18.966	31.289	4.691	14.706	24.261
Repository MPE-UC2 @ 45.0' - 47.5'	6.515	19.236	33.694	6.121	18.073	31.657	5.660	16.712	29.272	3.875	11.441	20.041
Repository MPE-UC2 @ 45.0' - 47.5' R	6.573	19.788	33.994	6.145	18.500	31.781	5.685	17.115	29.402	3.829	11.527	19.803
Repository MPE-UC1 @ 39.0' - 40.5'	7.754	25.417	40.102	7.229	23.696	37.387	6.635	21.749	34.315	3.706	12.148	19.167
Repository MPE-UC1 @ 39.0' - 40.5' R	7.884	26.400	40.775	7.341	24.581	37.966	6.756	22.623	34.941	4.679	15.668	24.199
I-1-23 US @ 32.0' - 34.5'	2.163	6.198	11.187	1.486	4.258	7.685	1.096	3.140	5.668	0.656	1.880	3.393
I-1-23 US @ 32.0' - 34.5' R	2.240	6.711	11.585	1.434	4.297	7.416	1.113	3.335	5.756	0.636	1.906	3.289
Repository MPE-US @ 30.5' - 32.5'	4.220	12.503	21.825	3.027	8.968	15.655	2.512	7.443	12.992	1.713	5.075	8.859
Repository MPE-US @ 30.5' - 32.5' R	4.049	12.356	20.941	2.302	7.025	11.906	2.068	6.311	10.695	1.225	3.738	6.335

Data Entered By: MC Date: 01/15/2001
Data Checked By: DPM Date: 01/15/01
Filename: RCK01235

ADVANCED TERRA TESTING, INC.

195

CAPILLARY MOISTURE RETENTION TEST
ASTM D 3152

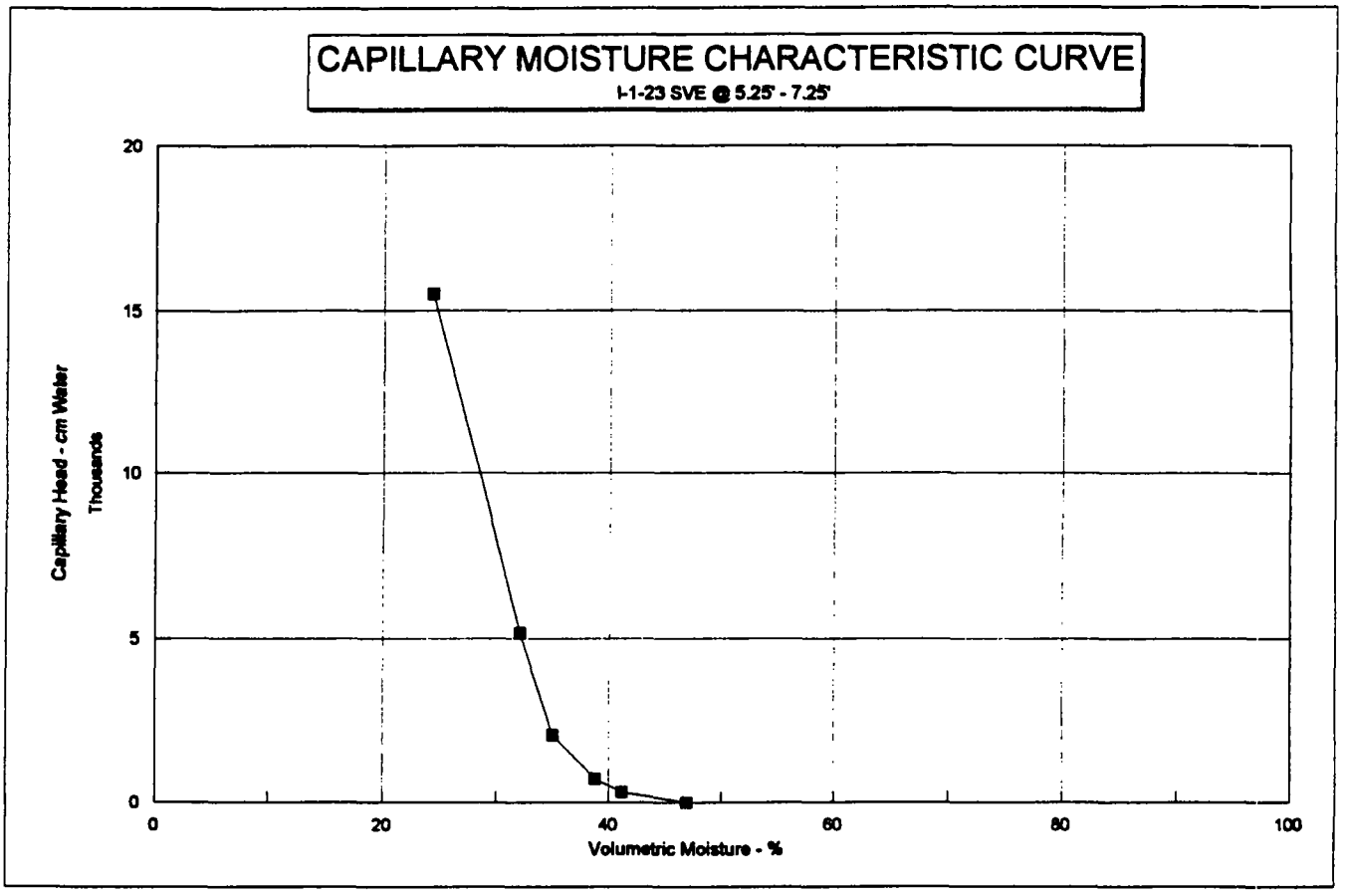
CLIENT	RMT Inc.	JOB NO.	2473-01
SAMPLE DATE		TEST STARTED	11/10/00 CL/DPM
SOIL DESCR.	Job # 4781.08	TEST FINISHED	1/8/01 DPM
LOCATION	Crab Orchard NWR		

	Vol. MC % Sat.	Vol. MC % 0.3 Bar	Vol. MC % 0.7 Bar	Vol. MC % 2 Bar	Vol. MC % 5 Bar	Vol. MC % 15 Bar
I-1-23 SVE @ 5.25' - 7.25'	46.95	41.20	38.85	35.02	32.04	24.30
I-1-23 SVE @ 5.25' - 7.25' R	49.60	42.54	40.21	35.83	32.34	23.88
I-1-2 SVE @ 6.0' - 8.0'	38.47	33.64	32.18	29.00	25.35	20.86
I-1-2 SVE @ 6.0' - 8.0' R	35.76	33.86	32.48	29.72	26.82	22.57
I-1-23 UC @ 14.0' - 16.0'	39.54	37.17	35.79	30.20	25.64	18.74
I-1-23 UC @ 14.0' - 16.0' R	48.55	39.20	37.16	33.91	31.29	24.26
Repository MPE-UC2 @ 45.0' - 47.5'	35.83	34.29	33.69	31.66	29.27	20.04
Repository MPE-UC2 @ 45.0' - 47.5' R	38.11	34.90	33.99	31.78	29.40	19.80
Repository MPE-UC1 @ 39.0' - 40.5'	46.98	41.55	40.10	37.39	34.31	19.17
Repository MPE-UC1 @ 39.0' - 40.5' R	44.39	41.96	40.77	37.97	34.94	24.20
I-1-23 US @ 32.0' - 34.5'	32.41	14.95	11.19	7.69	5.67	3.39
I-1-23 US @ 32.0' - 34.5' R	33.29	13.35	11.58	7.42	5.76	3.29
Repository MPE-US @ 30.5' - 32.5'	32.66	26.35	21.83	15.66	12.99	8.86
Repository MPE-US @ 30.5' - 32.5' R	38.62	21.69	20.94	11.91	10.70	6.34

% Saturation

	Sat.	0.3 Bar	0.7 Bar	2 Bar	5 Bar	15 Bar
I-1-23 SVE @ 5.25' - 7.25'	100.00	87.75	82.74	74.59	68.25	51.75
I-1-23 SVE @ 5.25' - 7.25' R	100.00	85.77	81.07	72.22	65.21	48.14
I-1-2 SVE @ 6.0' - 8.0'	100.00	87.44	83.66	75.40	65.89	54.24
I-1-2 SVE @ 6.0' - 8.0' R	100.00	94.69	90.83	83.09	75.00	63.11
I-1-23 UC @ 14.0' - 16.0'	100.00	94.00	90.52	76.38	64.84	47.38
I-1-23 UC @ 14.0' - 16.0' R	100.00	80.74	76.54	69.83	64.44	49.97
Repository MPE-UC2 @ 45.0' - 47.5'	100.00	95.71	94.05	88.36	81.71	55.94
Repository MPE-UC2 @ 45.0' - 47.5' R	100.00	91.59	89.21	83.40	77.16	51.97
Repository MPE-UC1 @ 39.0' - 40.5'	100.00	88.43	85.36	79.58	73.04	40.80
Repository MPE-UC1 @ 39.0' - 40.5' R	100.00	94.51	91.85	85.52	78.70	54.51
I-1-23 US @ 32.0' - 34.5'	100.00	46.13	34.51	23.71	17.49	10.47
I-1-23 US @ 32.0' - 34.5' R	100.00	40.11	34.80	22.28	17.29	9.88
Repository MPE-US @ 30.5' - 32.5'	100.00	80.68	66.83	47.93	39.78	27.13
Repository MPE-US @ 30.5' - 32.5' R	100.00	56.15	54.23	30.63	27.70	16.41

Data Entered By: MC Date: 01/15/2001
Data Checked By: DPM Date: 01/15/01


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 SVE @ 5.25' - 7.25'
Capillary Head - cm Water
Thousands
20
15
10
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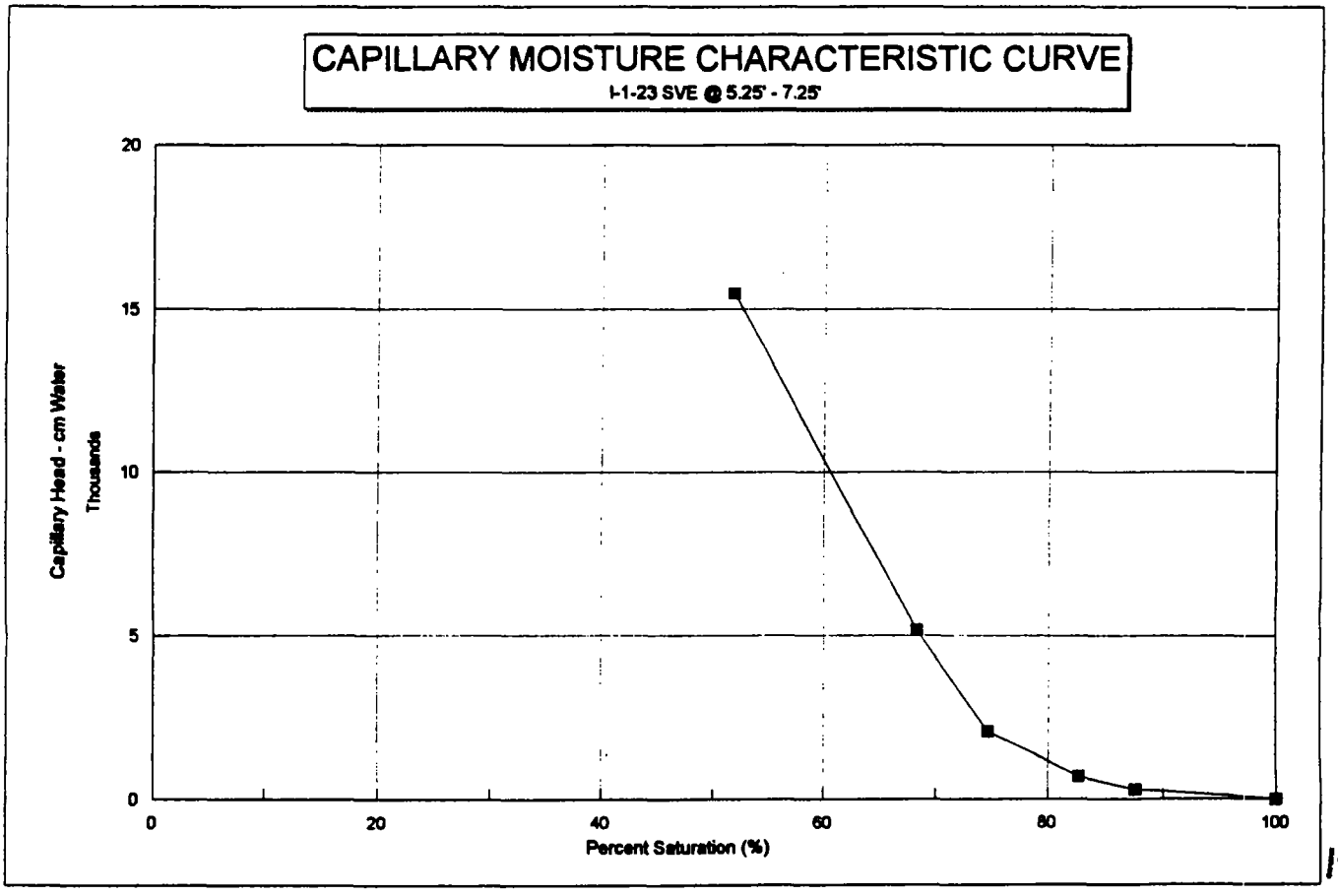
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 SVE @ 5.25' - 7.25'
Capillary Head - cm Water
Thousands
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15
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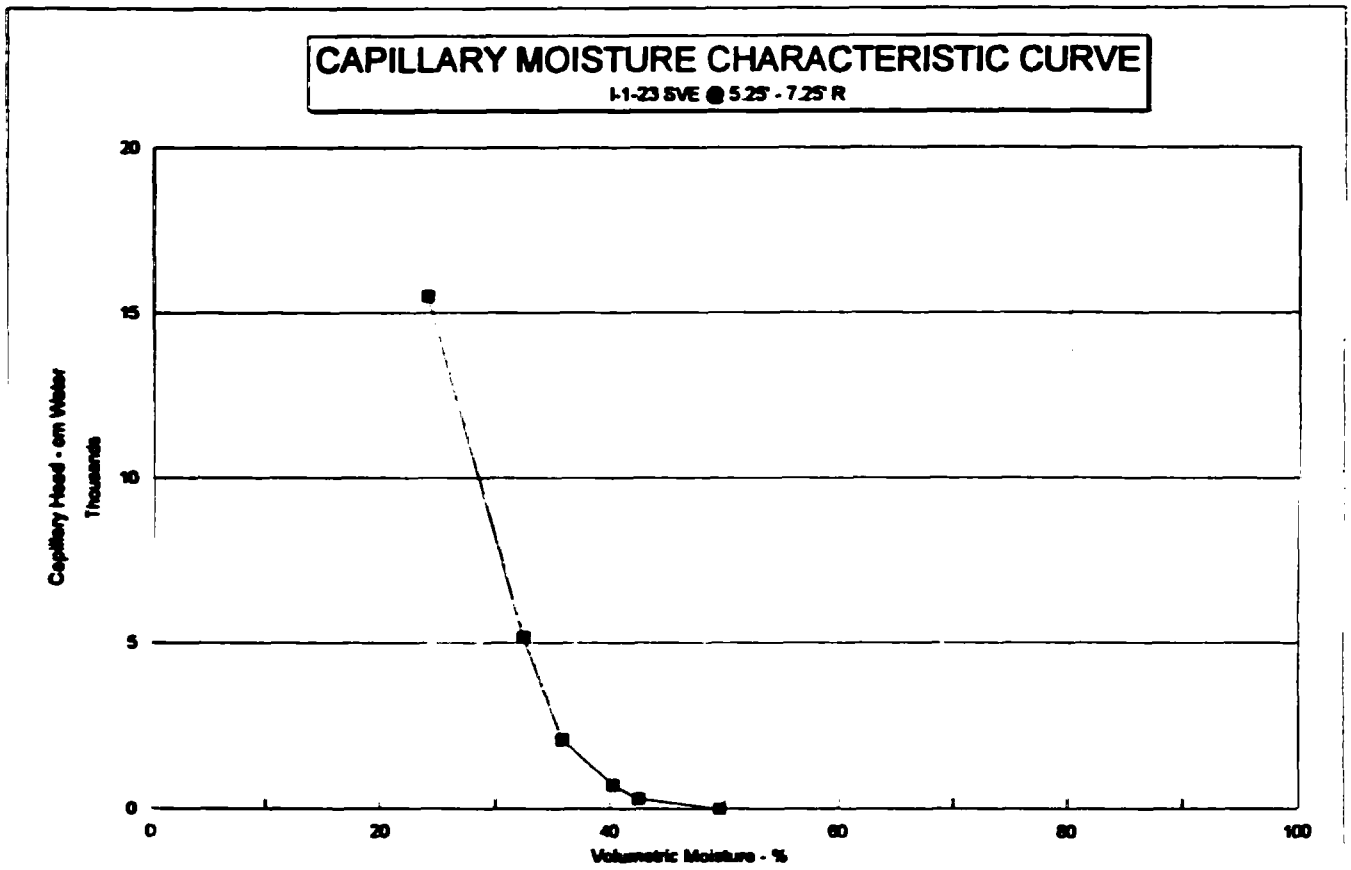
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 SVE @ 5.25' - 7.25' R
Capillary Head - cm Water
Thousands
20
15
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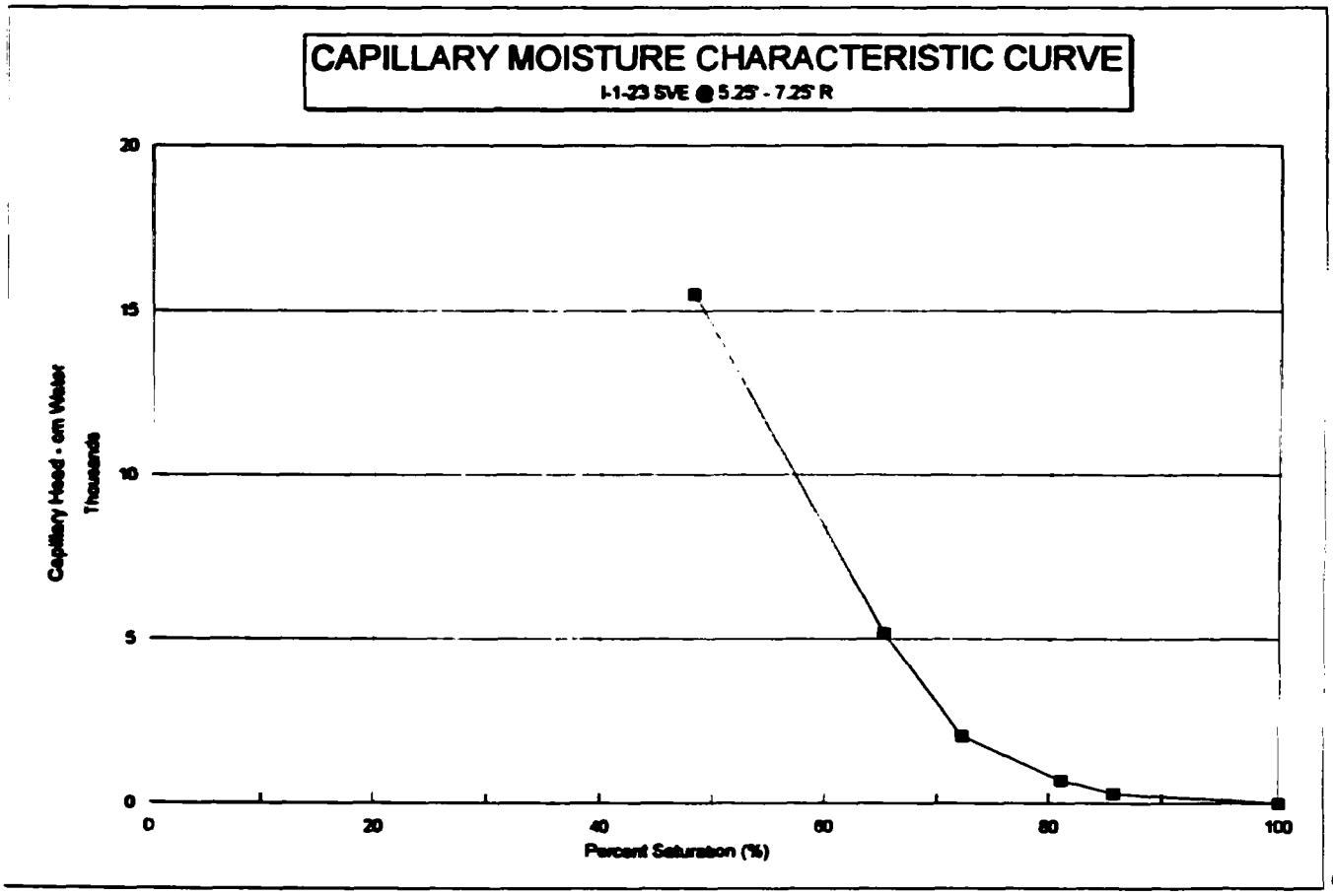
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 SVE @ 5.25' - 7.25' R
Capillary Head - cm Water
Thousands
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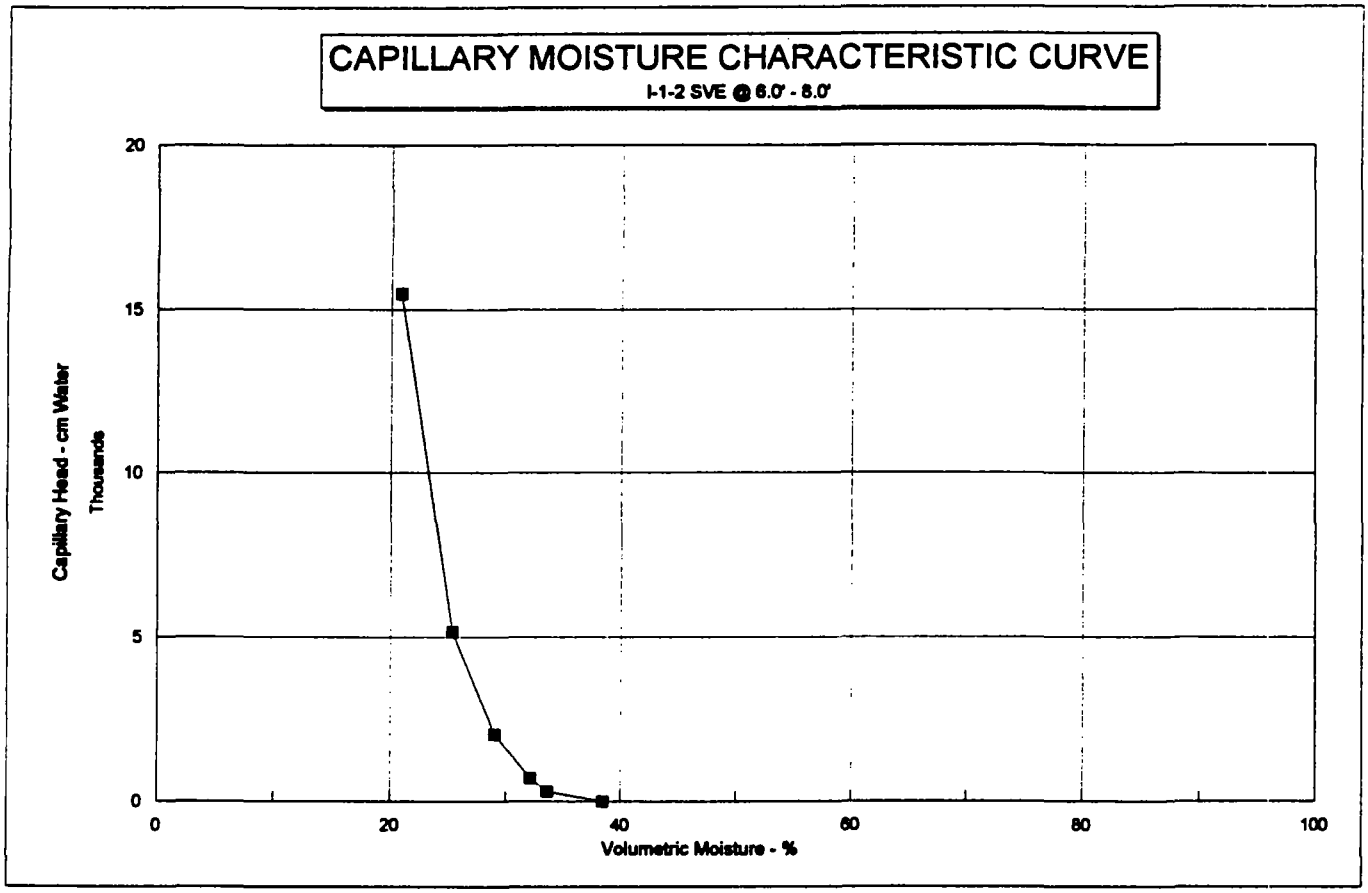
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-2 SVE @ 6.0' - 8.0'
Capillary Head - cm Water
Thousands
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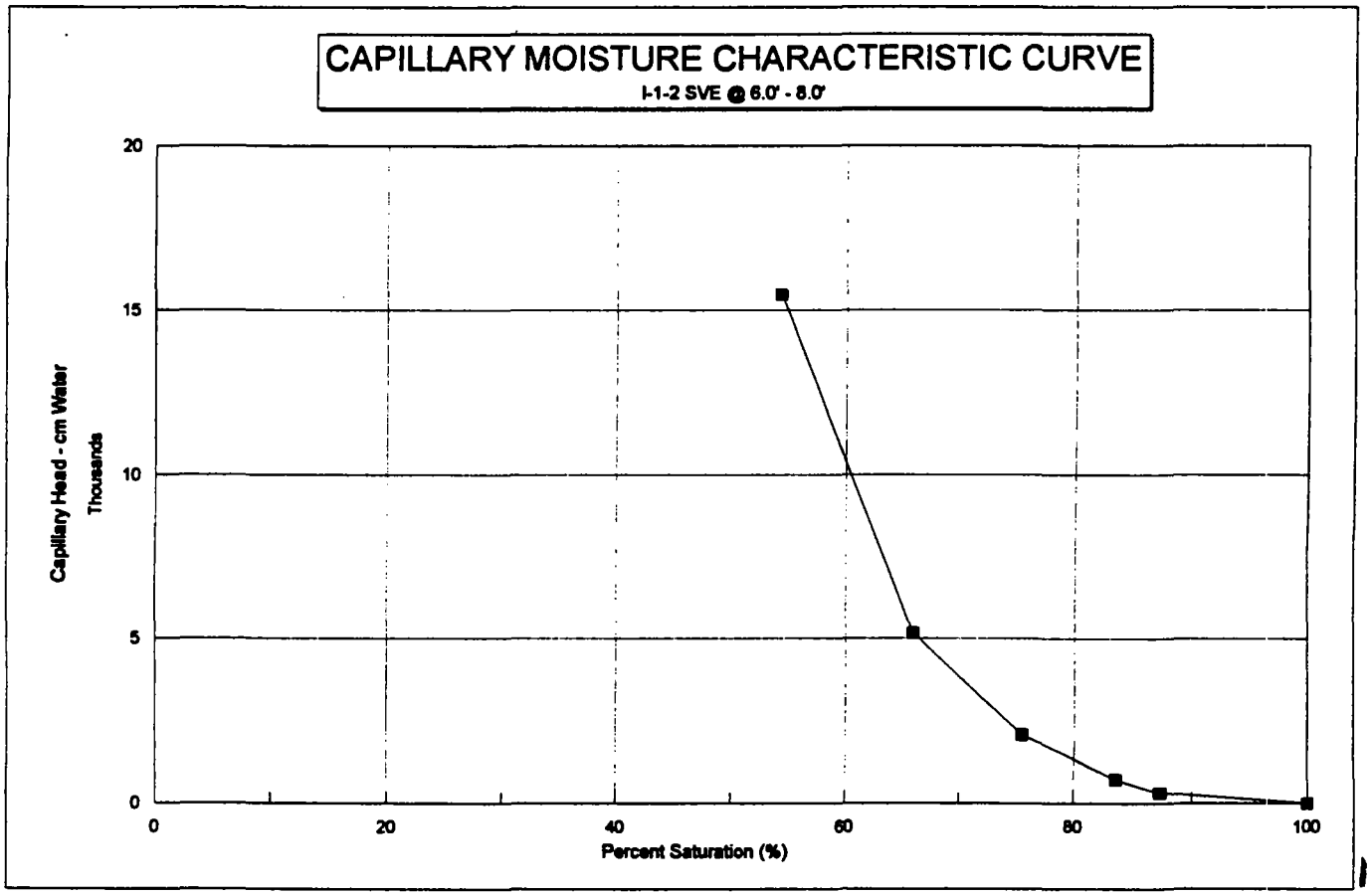
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-2 SVE @ 6.0' - 8.0'
Capillary Head - cm Water
Thousands
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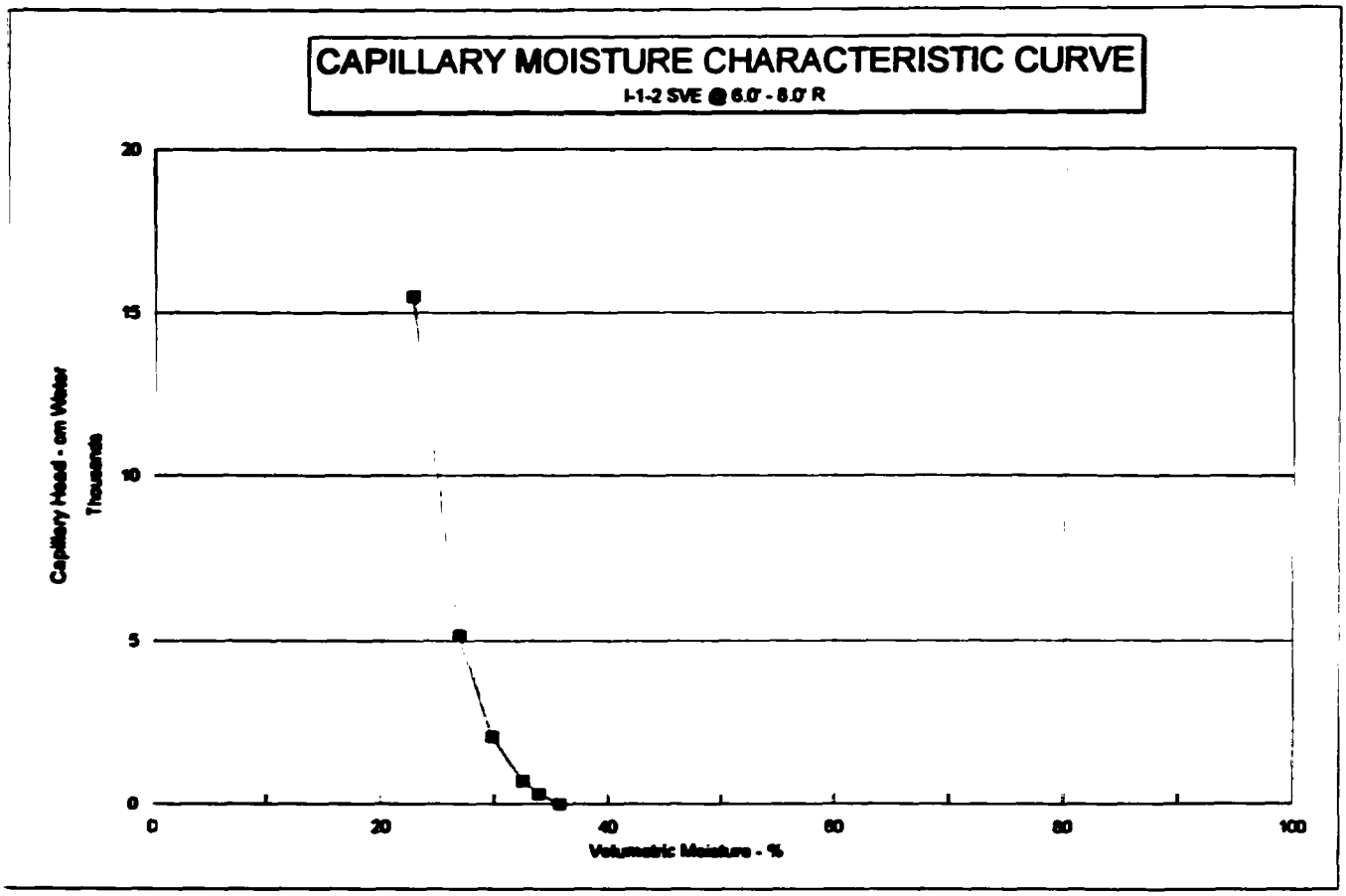
20
40
60
80
100
Percent Saturation (%)

197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I-1-2 SVE @ 6.0' - 8.0' R
Capillary Head - cm Water
Thousands
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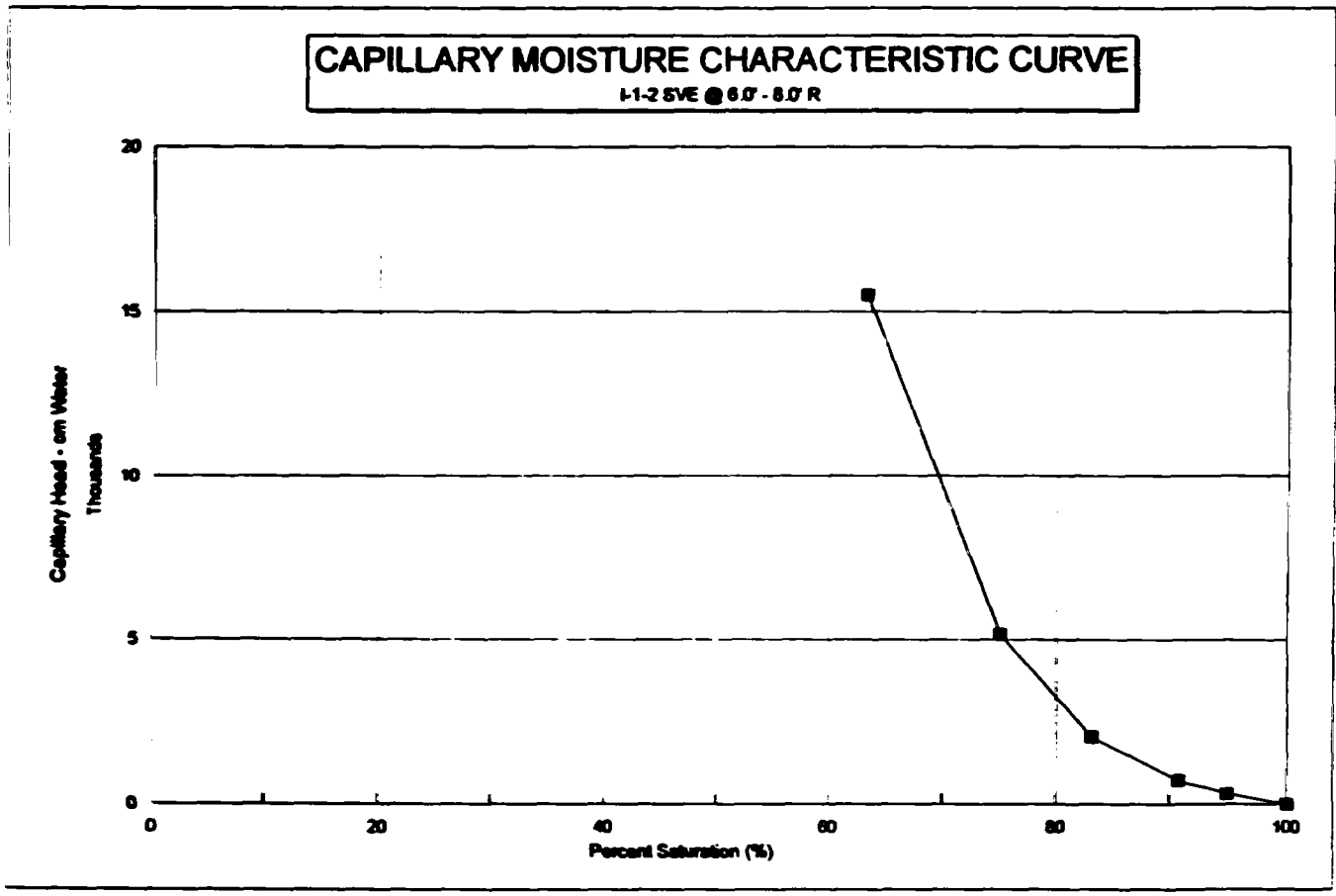
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-2 SVE @ 6.0' - 8.0' R
Capillary Head - cm Water
Thousands
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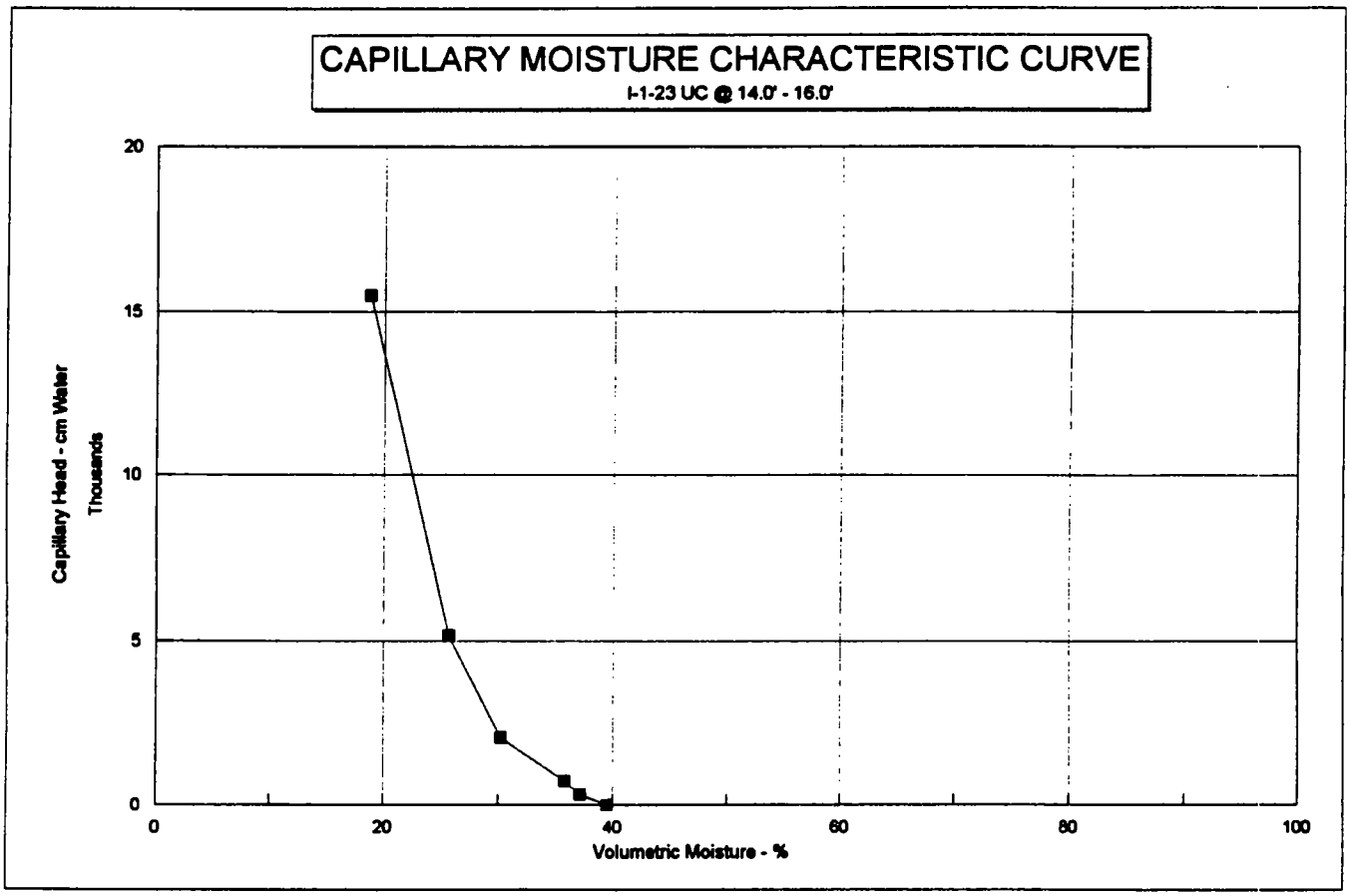
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 UC @ 14.0' - 16.0'
Capillary Head - cm Water
Thousands
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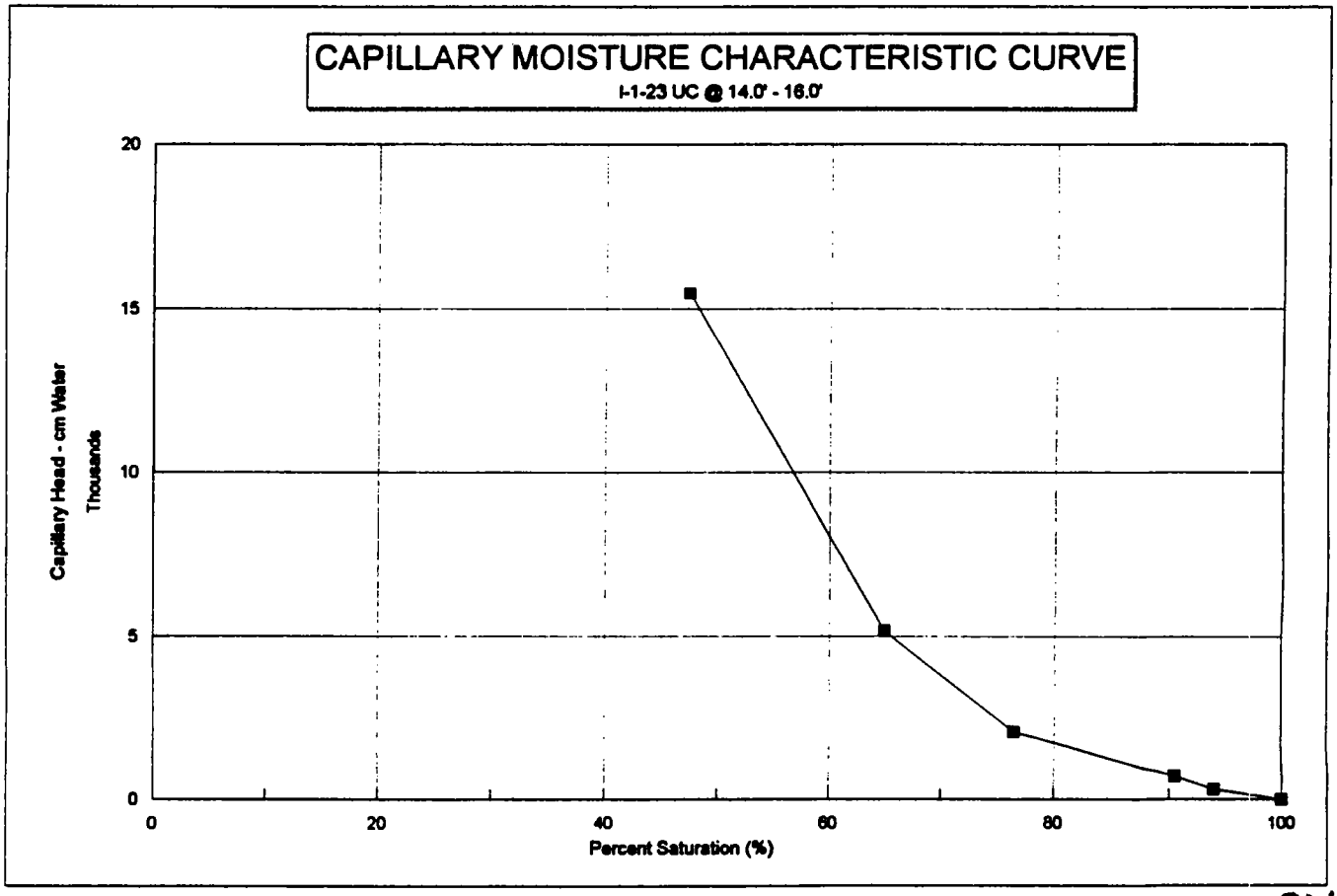
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 UC @ 14.0' - 16.0'
Capillary Head - cm Water
Thousands
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20
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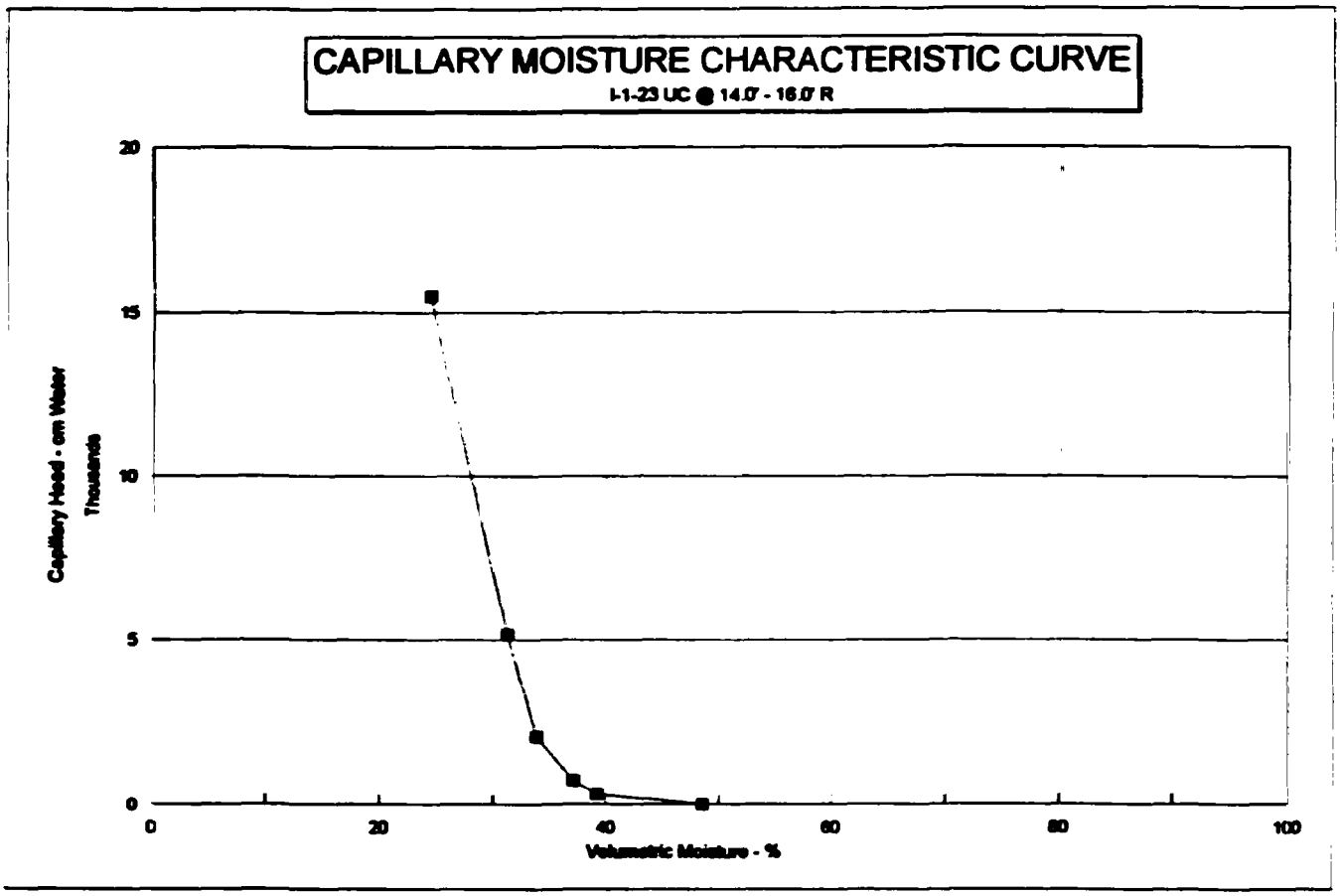
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 UC @ 14.0' - 16.0' R
Capillary Head - cm Water
Thousands
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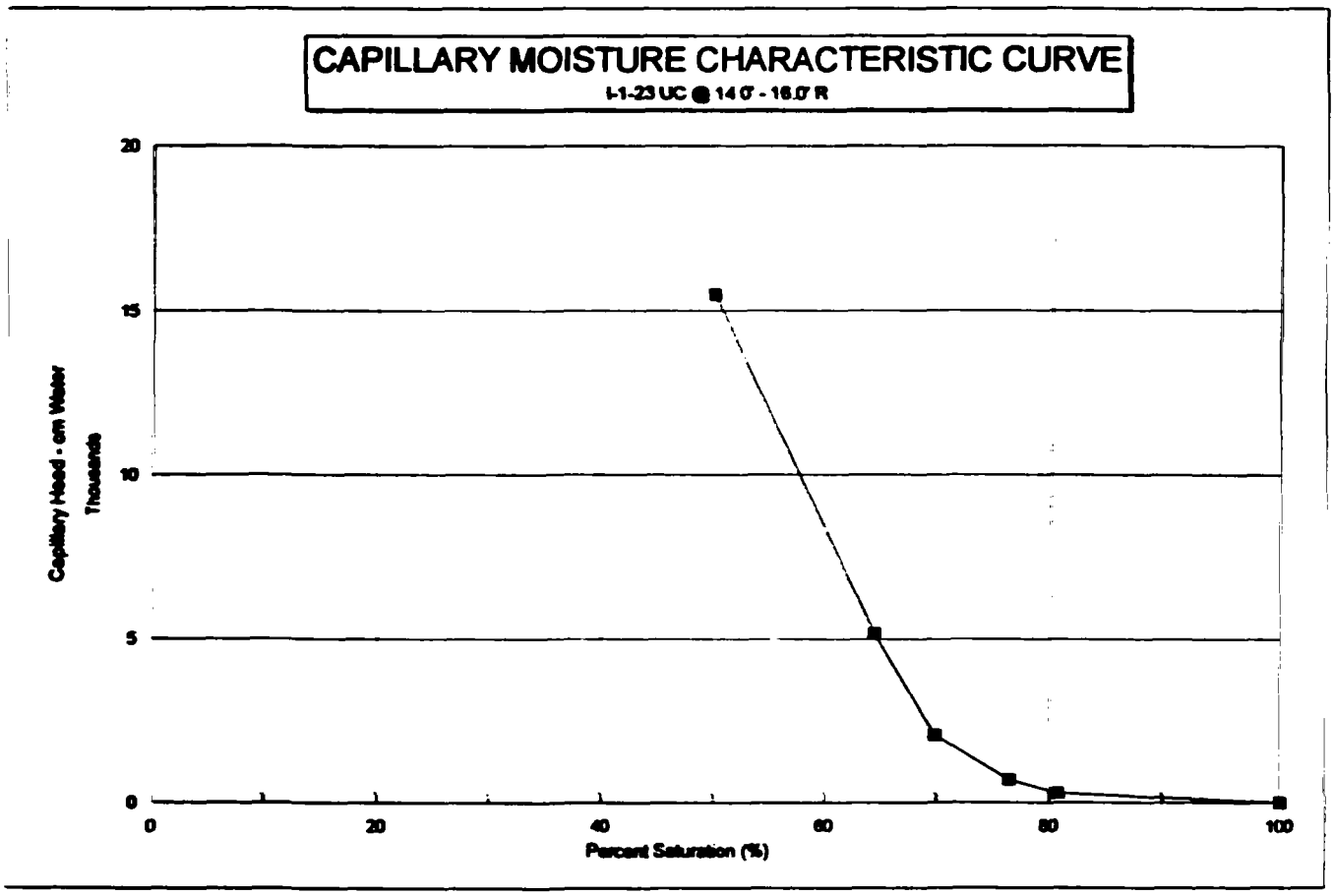
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 UC @ 14.0' - 16.0' R
Capillary Head - cm Water
Thousands
20
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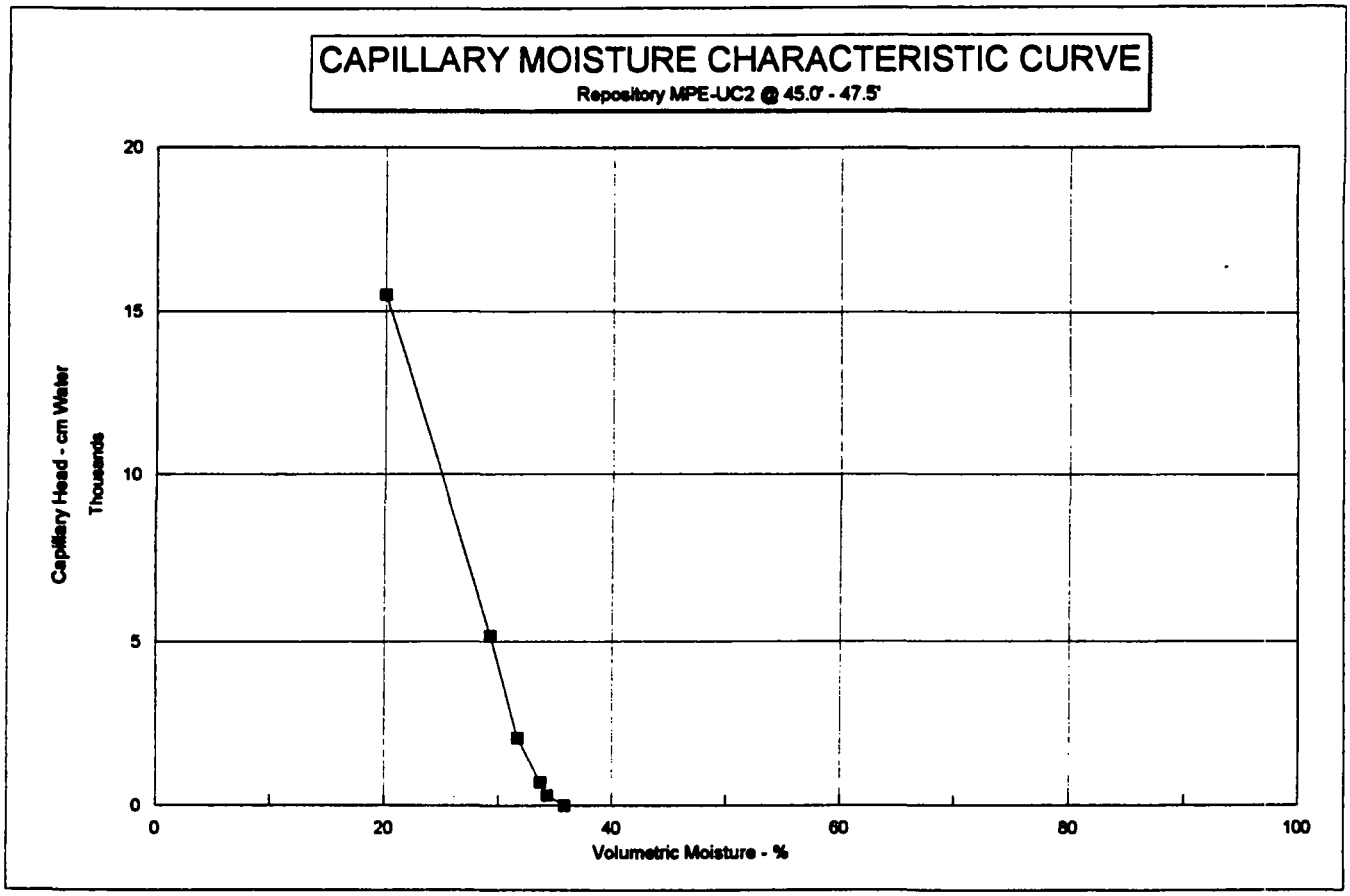
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-UC2 @ 45.0' - 47.5'
Capillary Head - cm Water
Thousands
20
15
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0
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20
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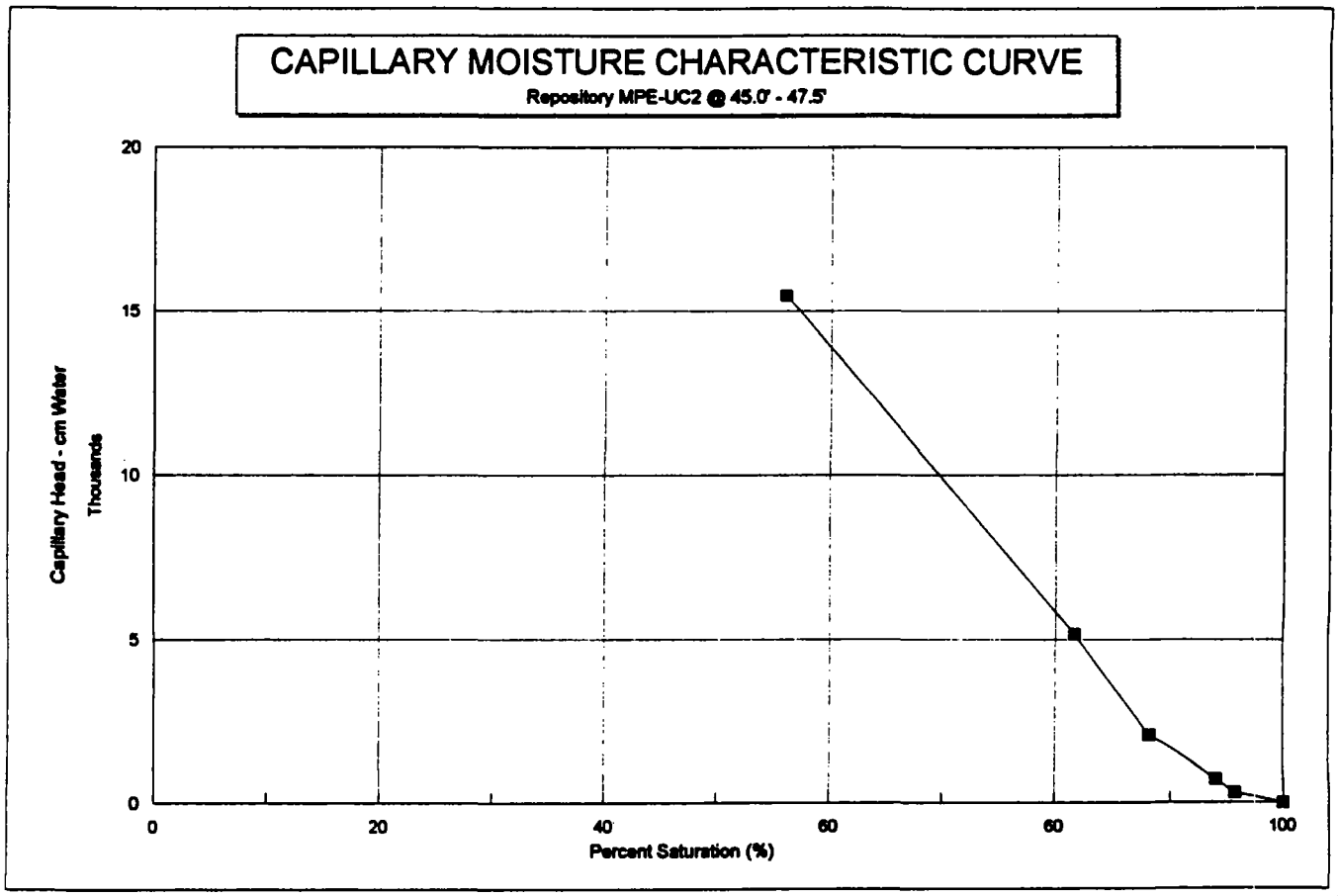
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-UC2 @ 45.0' - 47.5'
Capillary Head - cm Water
Thousands
20
15
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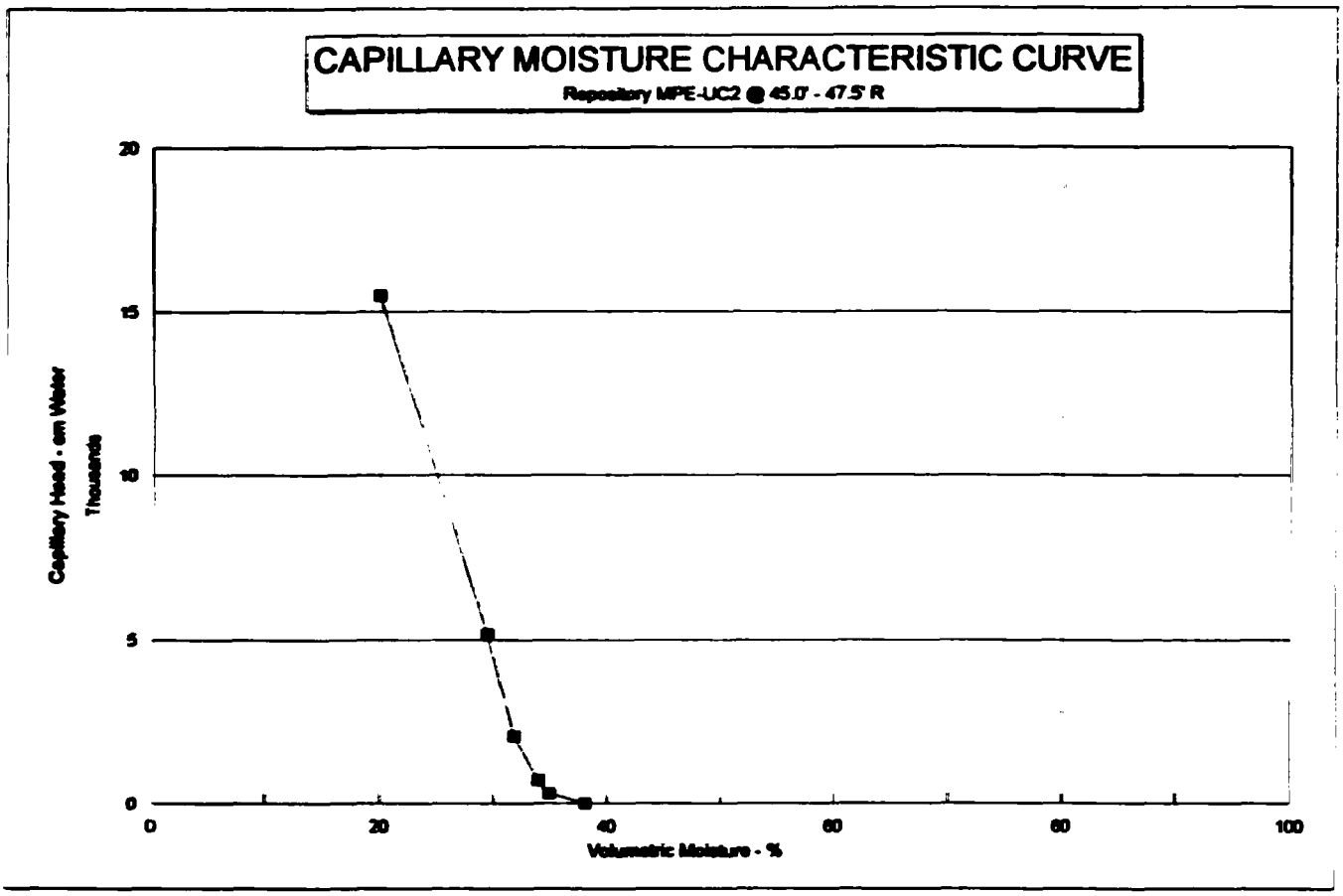
60
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-UC2 @ 45.0' - 47.5' R
Capillary Head - cm Water
Thousands
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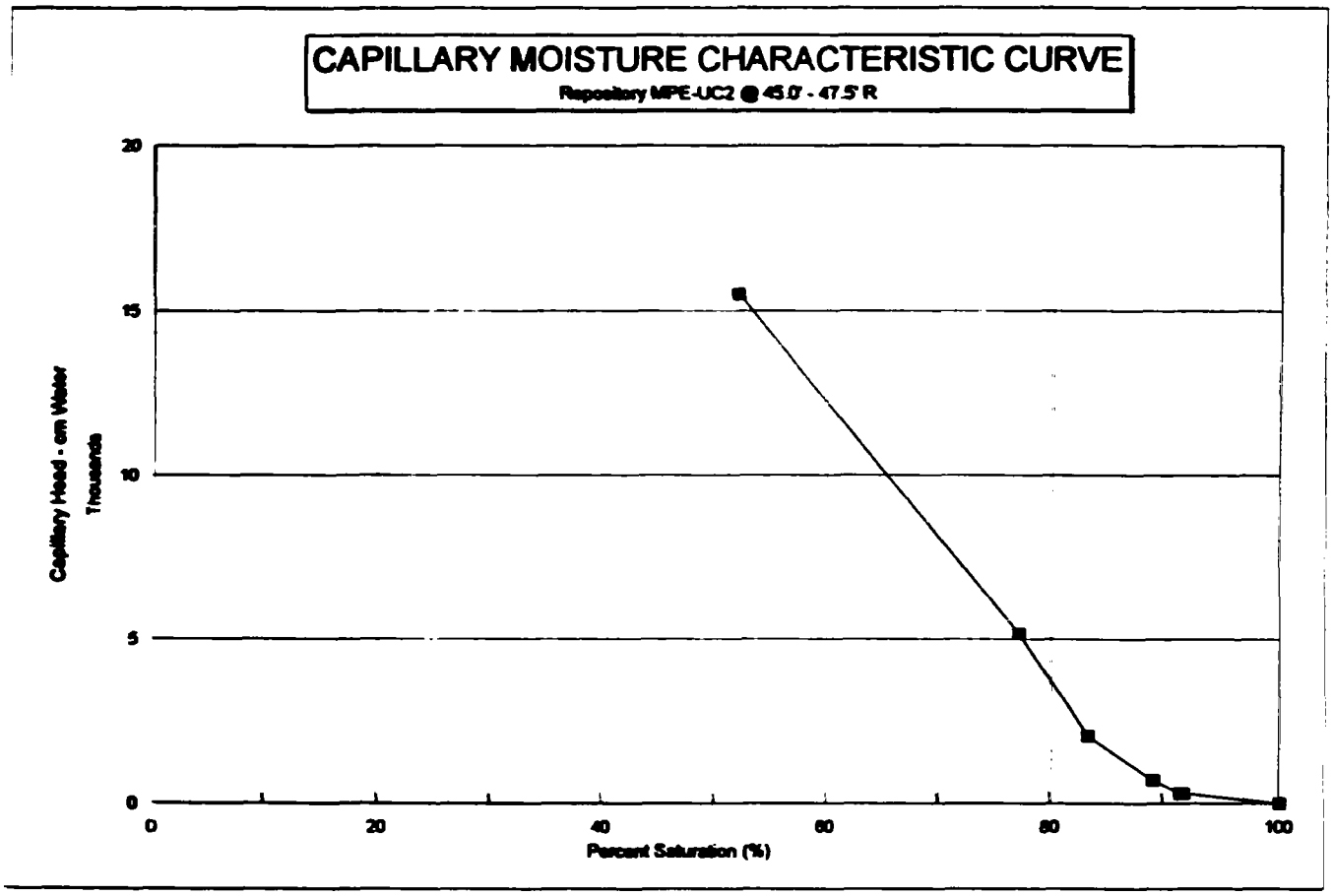
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-UC2 @ 45.0' - 47.5' R
Capillary Head - cm Water
Thousands
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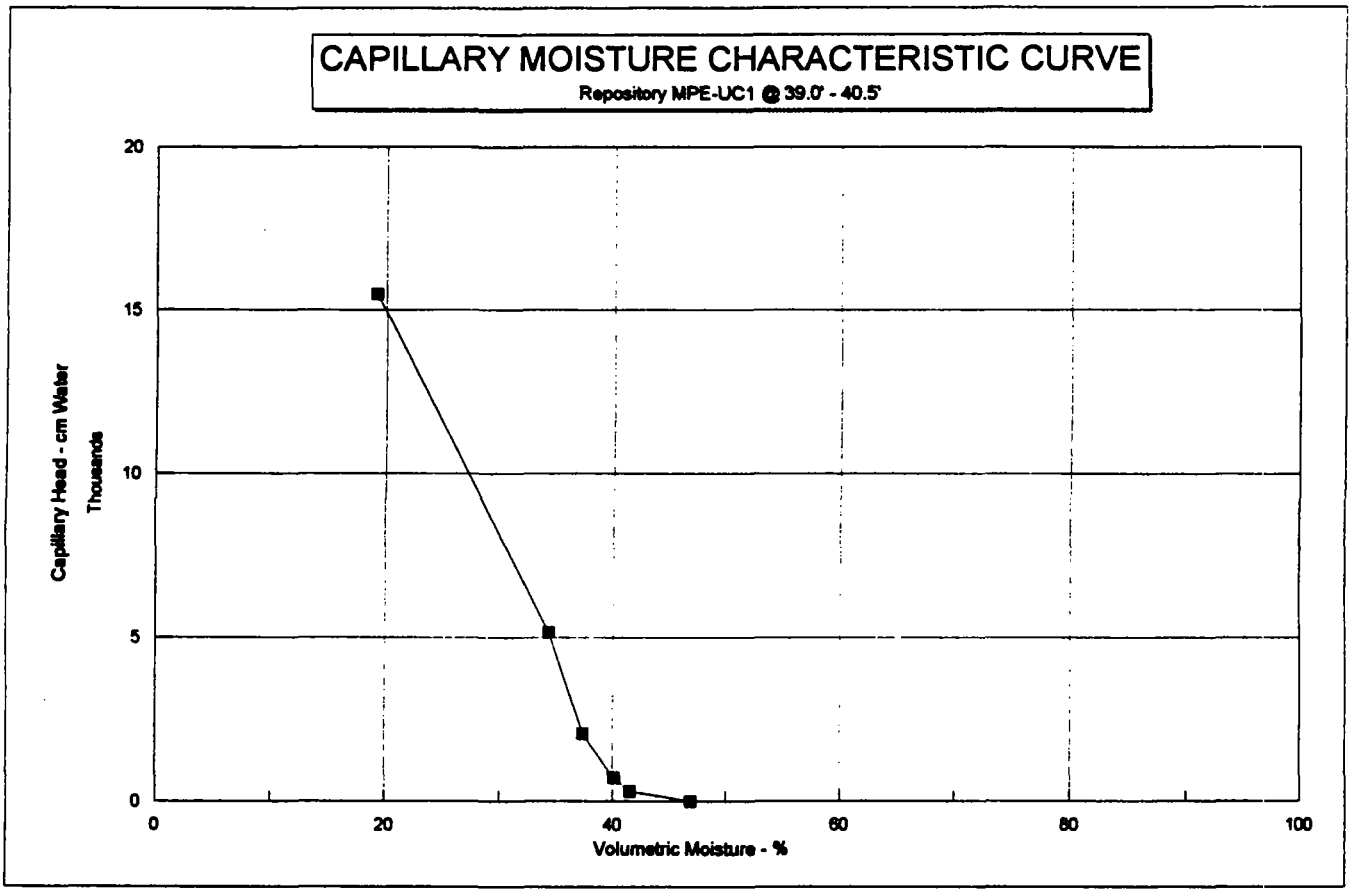
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-UC1 @ 39.0' - 40.5'
Capillary Head - cm Water
Thousands
20
15
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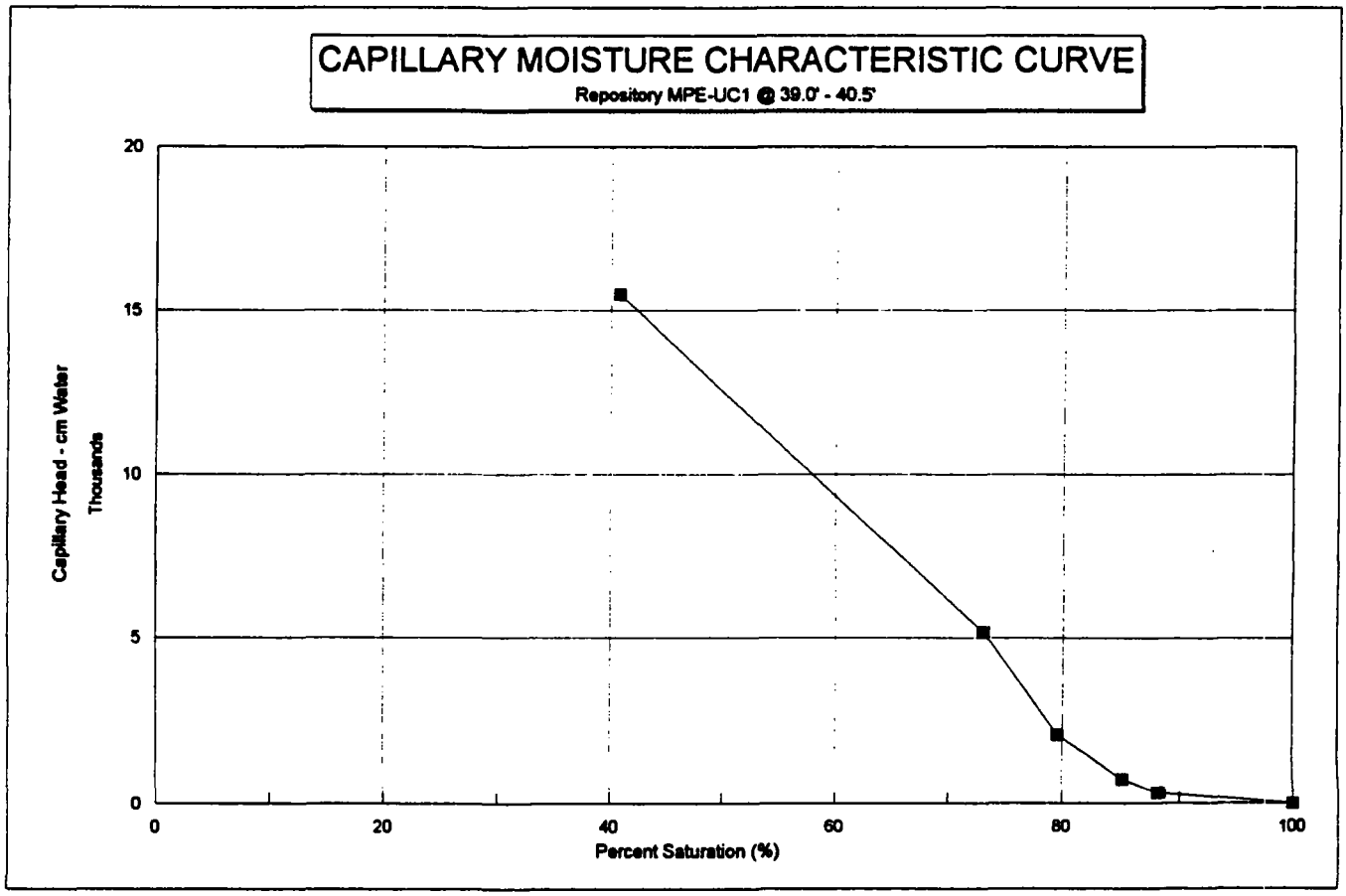
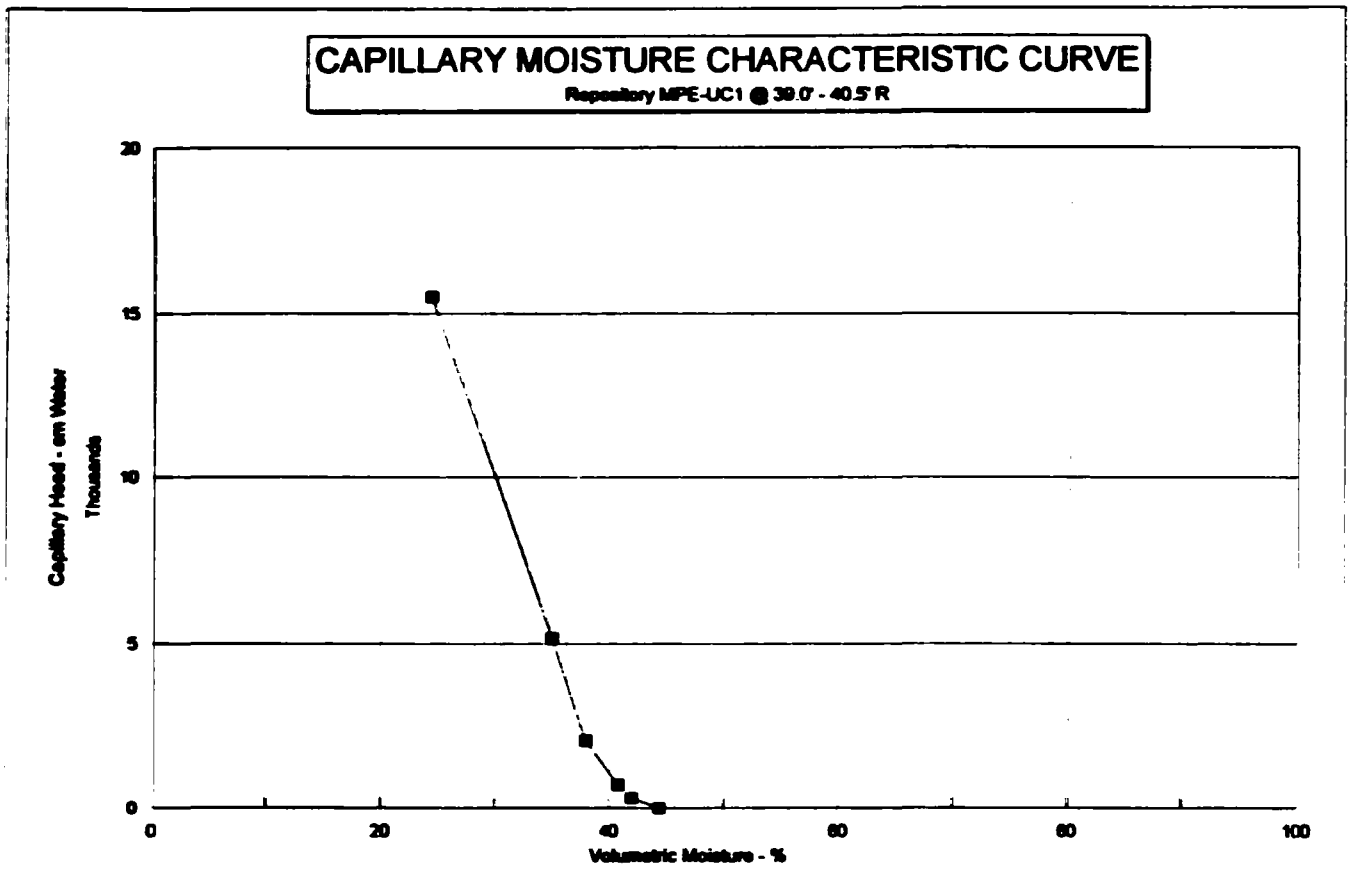
0
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-UC1 @ 39.0' - 40.5'
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-UC1 @ 39.0' - 40.5' R
Capillary Head - cm Water
Thousands
20
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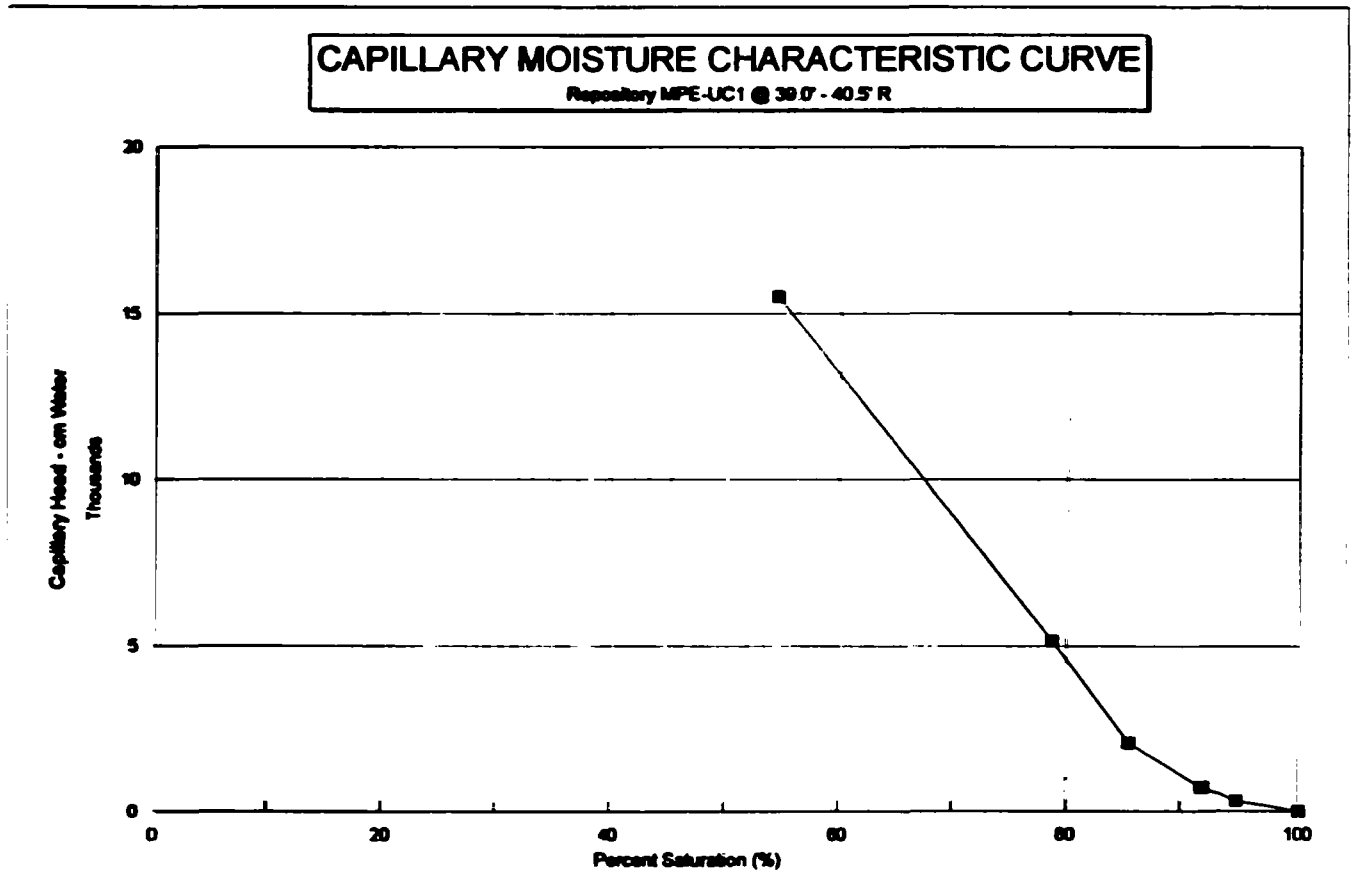
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-UC1 @ 39.0' - 40.5' R
Capillary Head - cm Water
Thousands
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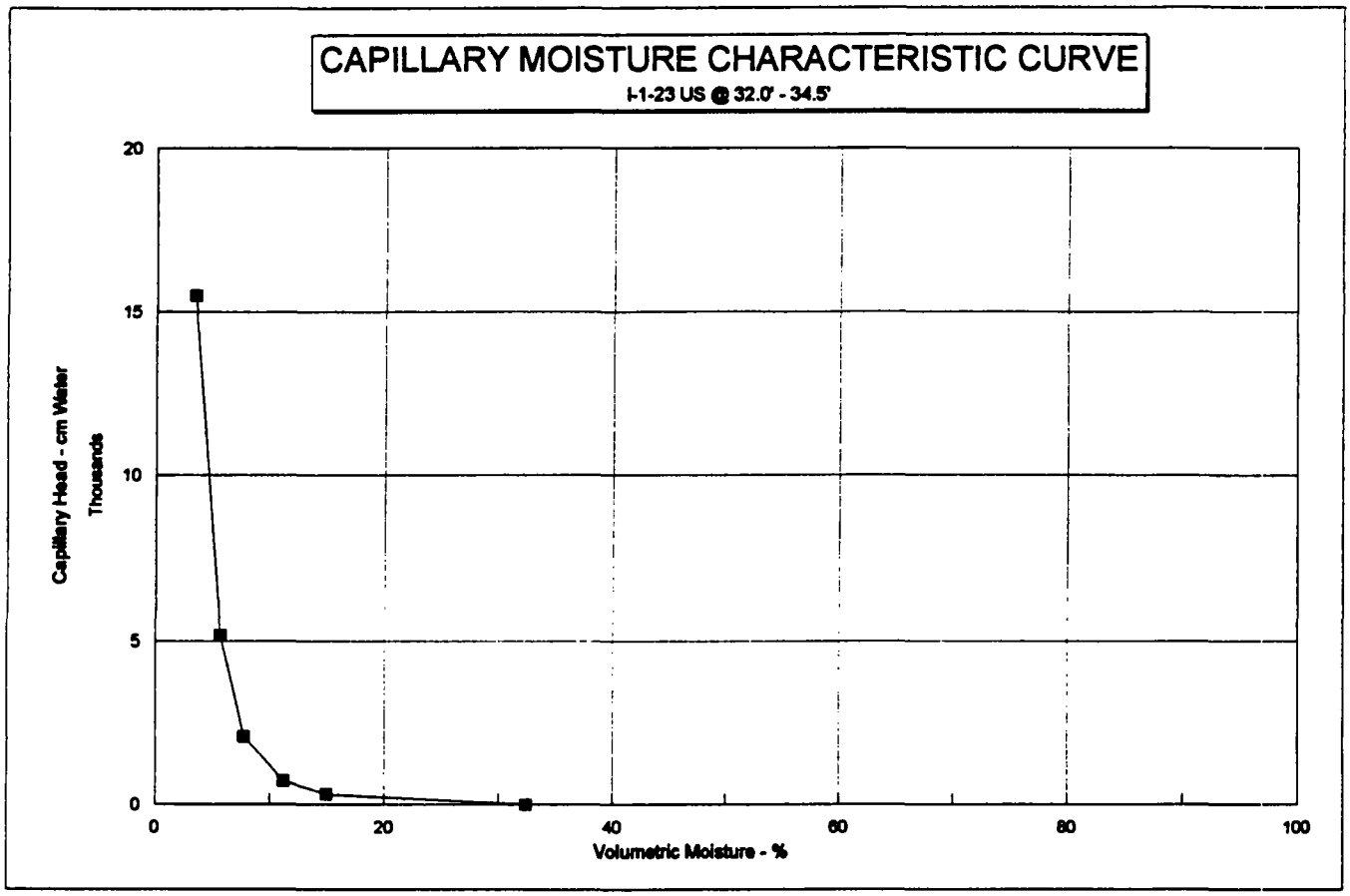
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 US @ 32.0' - 34.5'
Capillary Head - cm Water
Thousands
20
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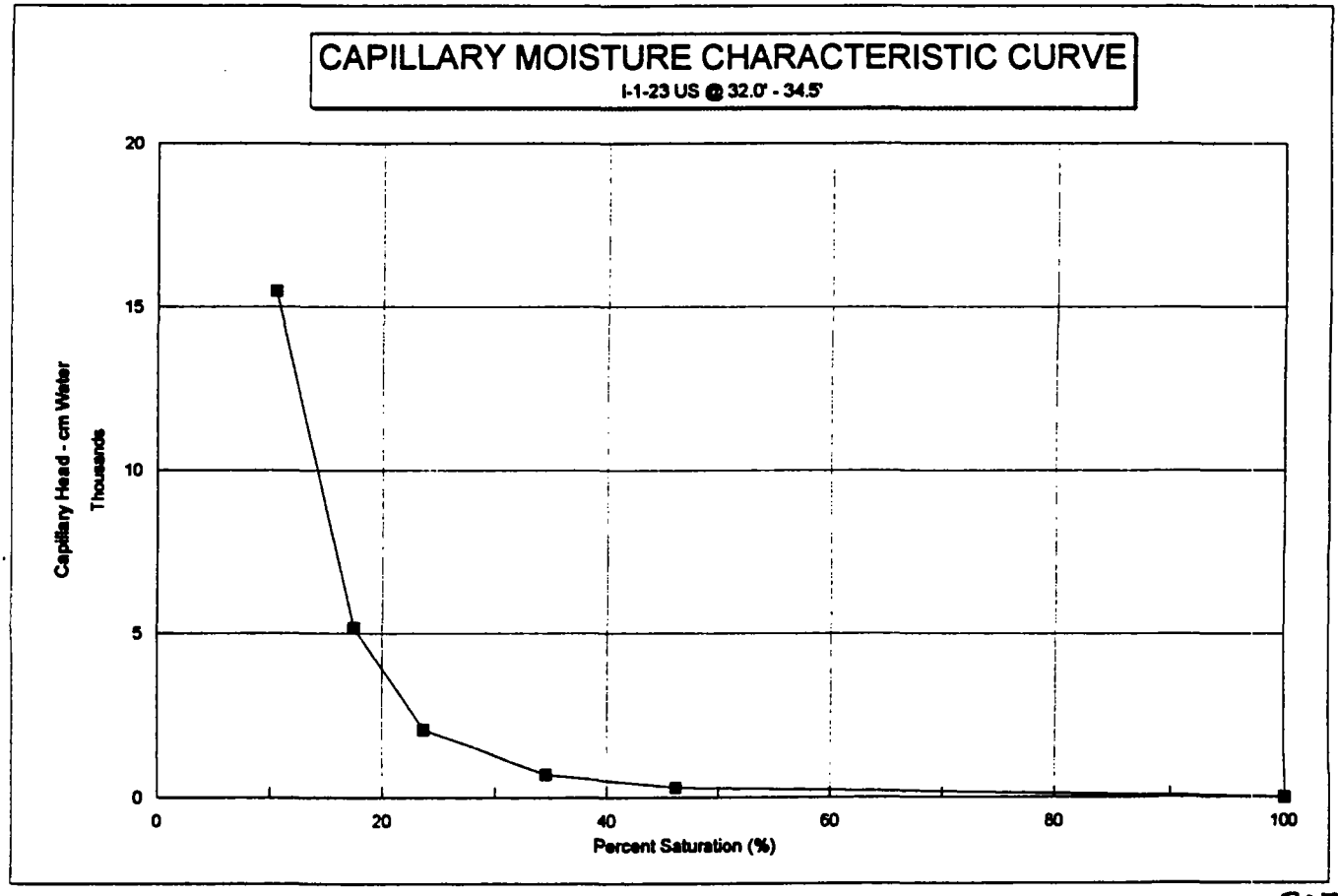
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 US @ 32.0' - 34.5'
Capillary Head - cm Water
Thousands
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40
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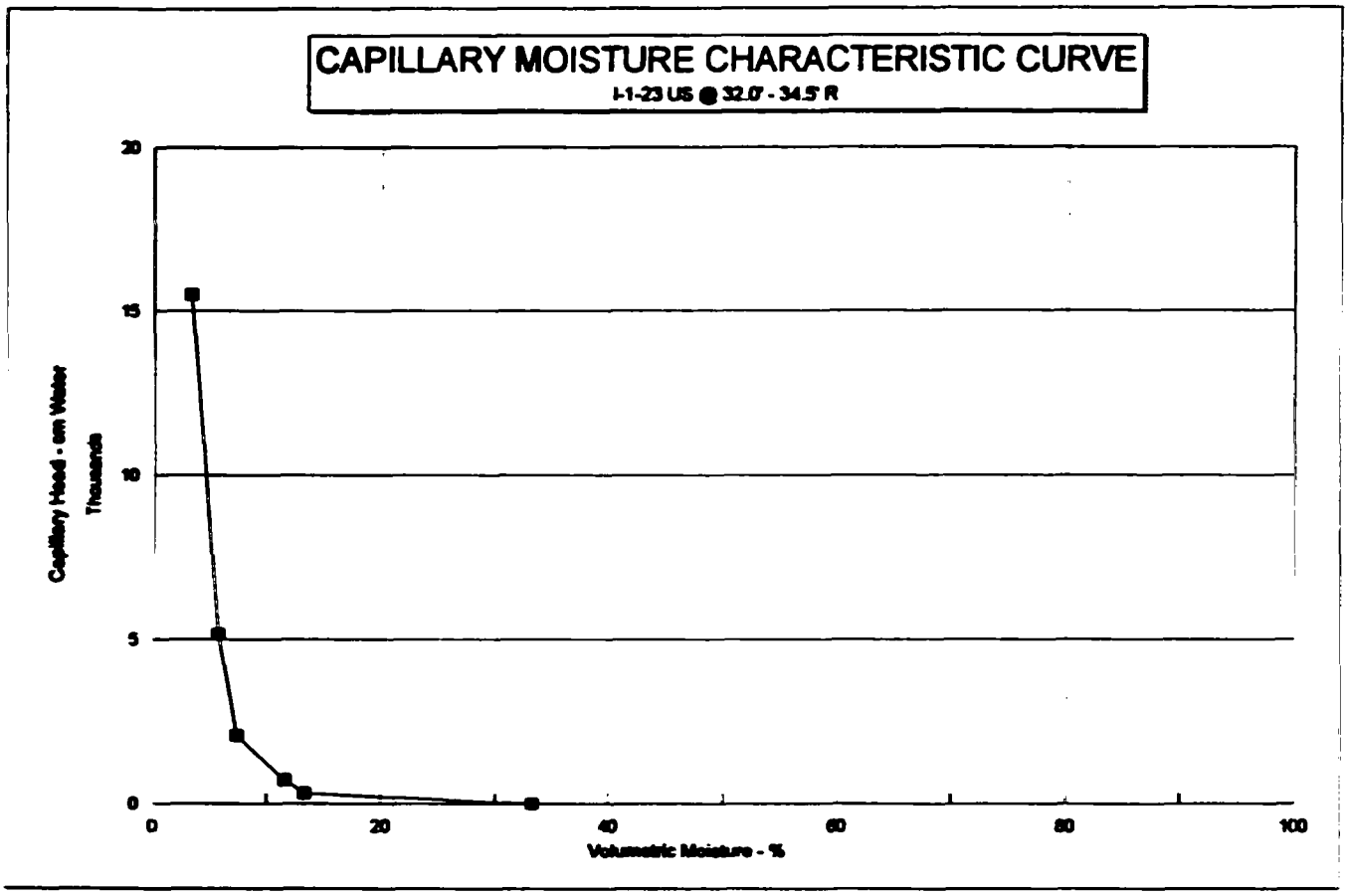
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 US @ 32.0' - 34.5' R
Capillary Head - cm Water
Thousands
20
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20
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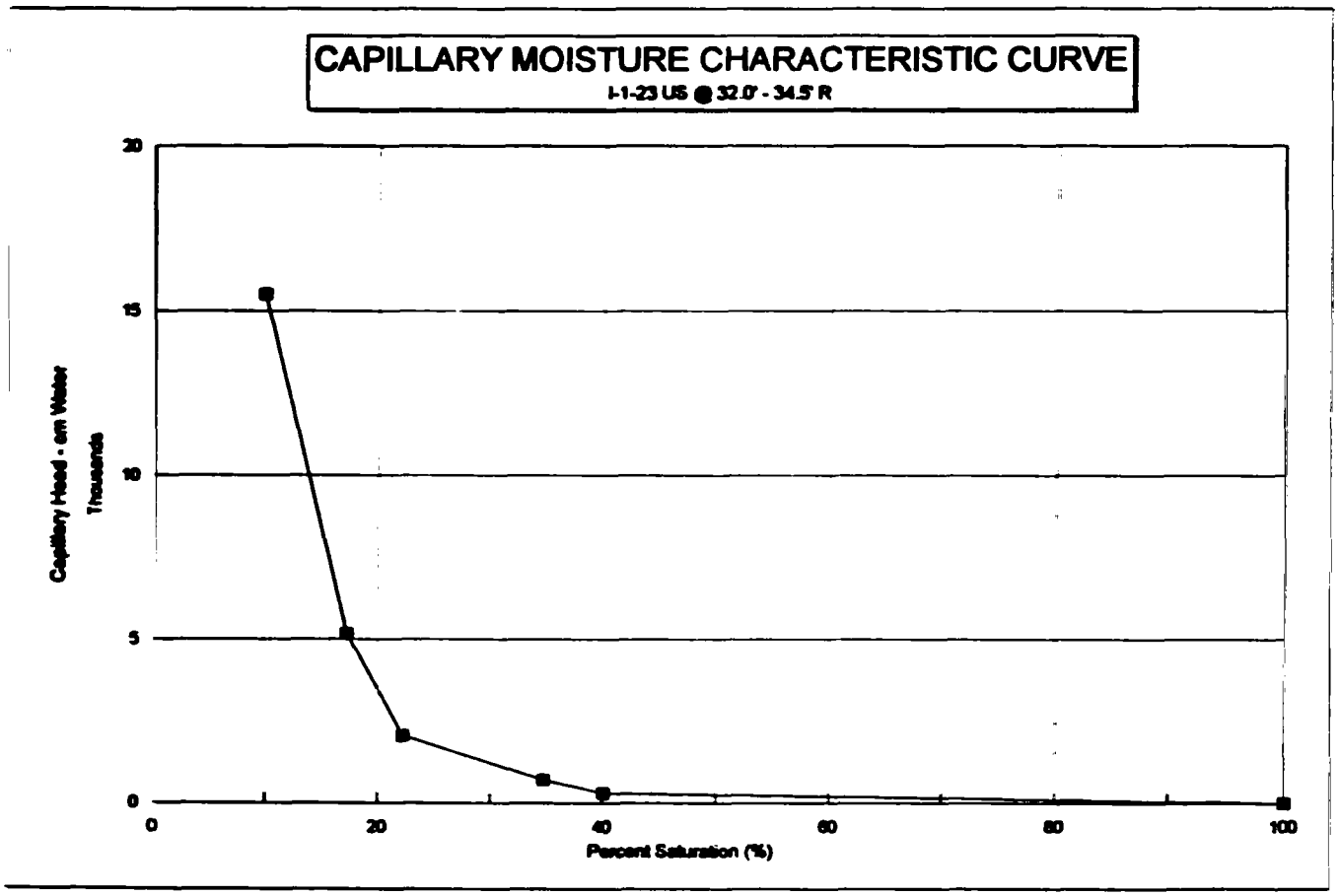
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
I-1-23 US @ 32.0' - 34.5' R
Capillary Head - cm Water
Thousands
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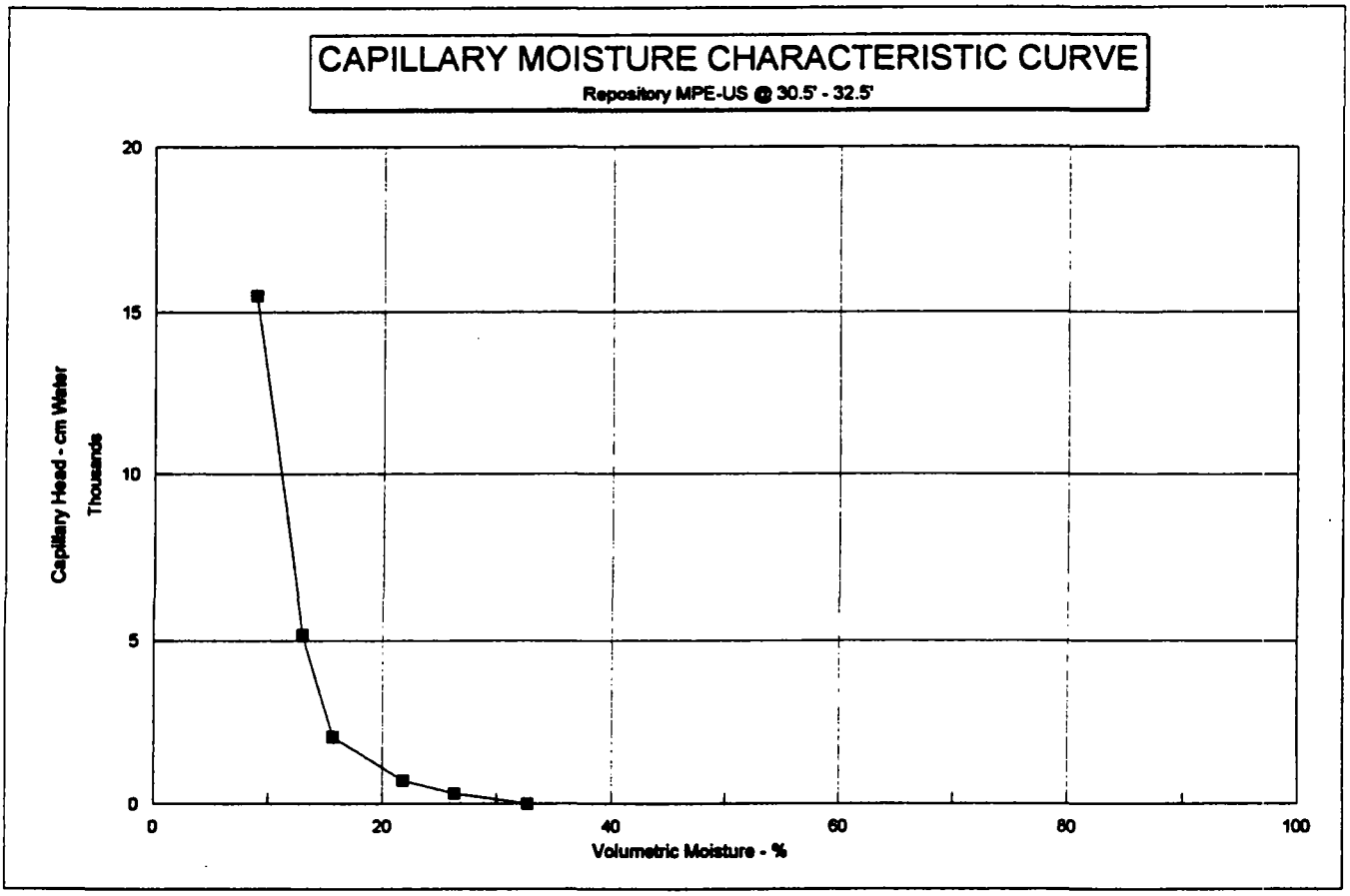
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-US @ 30.5' - 32.5'
Capillary Head - cm Water
Thousands
20
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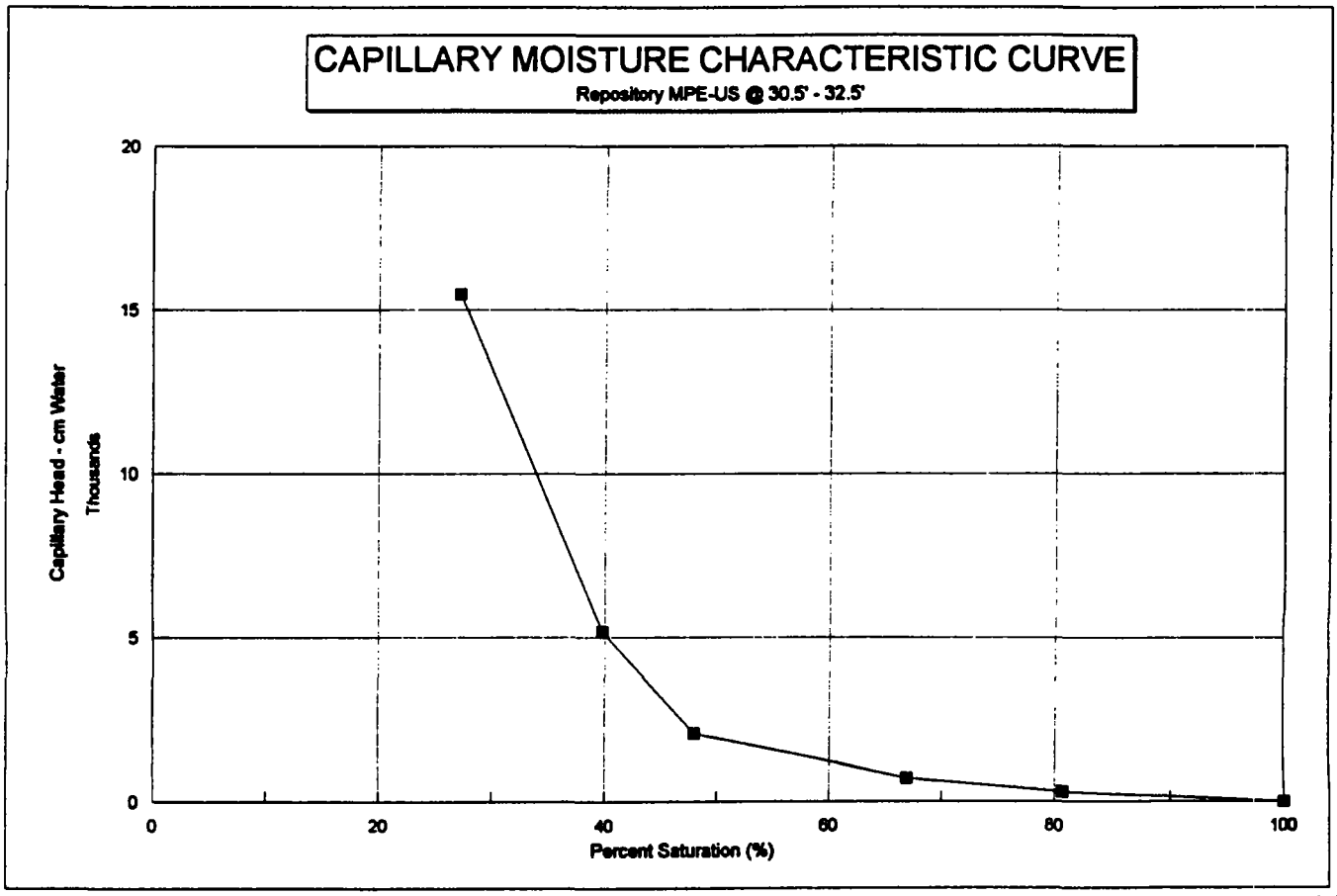
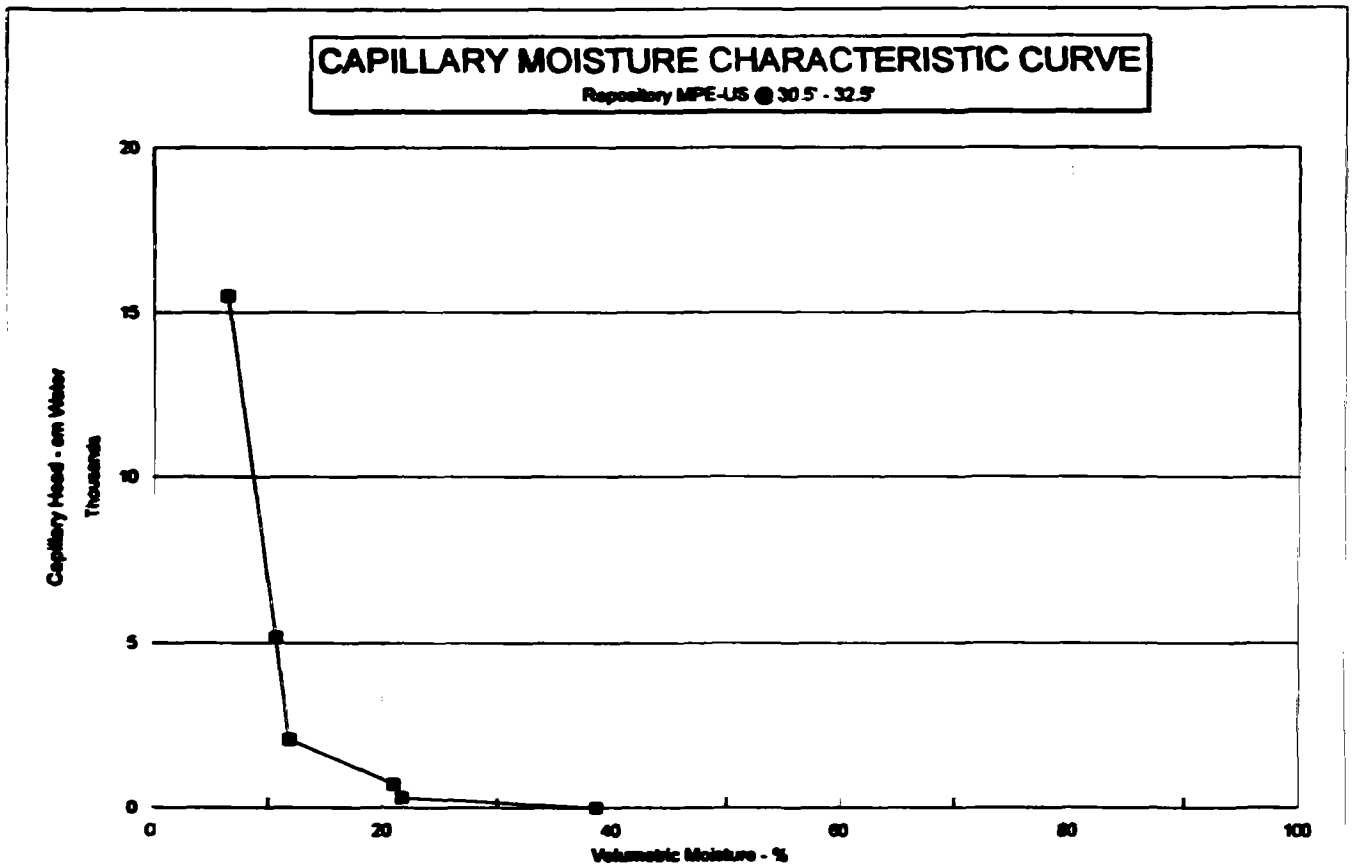
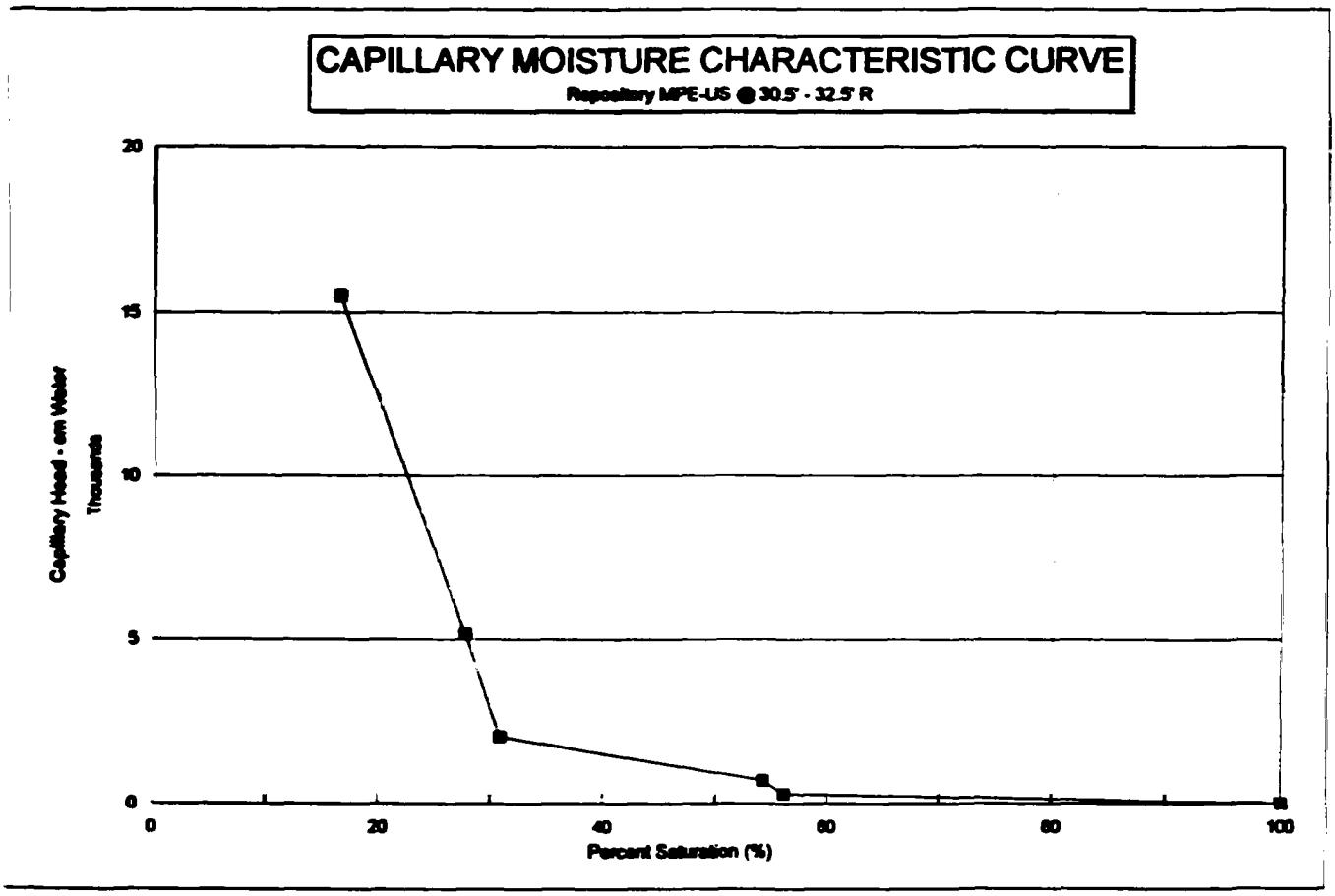
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-US @ 30.5' - 32.5'
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Percent Saturation (%)


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-US @ 30.5' - 32.5'
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Volumetric Moisture - %


CAPILLARY MOISTURE CHARACTERISTIC CURVE
Repository MPE-US @ 30.5' - 32.5' R
Capillary Head - cm Water
Thousands
20
15
10
5
0
0
20
40
60
80
100
Percent Saturation (%)

Appendix R
Soil Nutrient Analysis Laboratory Reports and Phytoremediation Technical References

Phytoremediation – Technical References

Phytoremediation Overview

Phytoremediation is the use of vegetation to remediate or prevent the contamination of soil and groundwater. Plants can enhance the removal of organic pollutants through several mechanisms:

1. Phytotransformation - uptake of a contaminant and transformation in plant tissue to less toxic metabolites.
2. Phytovolatilization - uptake and release of a contaminant to the atmosphere by evapotranspiration of water from plant tissue.
3. Rhizofiltration - accumulation of contaminants by sorption onto plant roots.
4. Rhizosphere bioremediation - stimulation of root-associated degrader microorganisms through release of root exudates and sloughing of root cells.
5. Phytostabilization – prevention of contaminant transport by wind-blown dust, reduction of soil erosion, or hydraulic containment of a contaminant plume.

The rhizosphere is a zone at the root-soil interface under the influence of the root. The rhizosphere of plants can promote the degradation of organic pollutants by several processes, such as with an increase in microbial populations and diversity and a decrease in the acclimation period before organic degradation begins. Plant root exudates can increase microbial concentrations in soil by 10-100 times (Katznelson, 1965).

Phytoremediation Success with the Contaminants of Concern

Clean-up of TCE has been at the forefront of phytoremediation, both in laboratory studies and in field applications. A substantial body of literature has been developed for phytoremediation at the bench- and pilot-scale. Numerous laboratory studies and field applications have demonstrated the effectiveness of hybrid poplar trees in treating organic pollutants (Wichman, 1990; Paterson and Schnoor, 1992; Burken, 1993; Nair et al., 1993; Burken, 1996; Newman et al., 1997; Thompson, 1997; Burken and Schnoor, 1998; Newman et al., 1999; Aitchison, 2000).

Several examples of TCE-related studies and field sites are summarized below.

1. Newman et al. (1997) found that hybrid poplars exposed for 8 months to 50 mg/L TCE readily took up TCE, metabolized it in plant tissue to carbon dioxide, trichloroethanol, dichloroacetic acid, and trichloroacetic acid, and transpired a portion to the atmosphere. TCE was detected in the stems at maximum concentrations of 2×10^{-6} g TCE/g stem, but concentrations were negligible in the leaves. Trichloroacetic acid (TCAA) was detected in the leaves at a maximum concentration of 7×10^{-6} g TCAA/g leaf. Concentrations of trichloroethanol and dichloroacetic acid were less than 4×10^{-7} g/g plant material.

2. Burken and Schnoor (1998) found that hybrid poplars were extremely efficient at taking up TCE from aqueous solution and transpired 70 percent of it from plant tissue. They also found that hybrid poplars readily took up benzene, toluene, ethylbenzene, and xylene, and transpired 41-91 percent of the compound taken up.

3. Newman et al. (1999) exposed hybrid poplar trees to TCE-contaminated water (average concentration = 50 mg/L) under field conditions in lined cells for 3 years. The trees removed 99 percent of the added TCE during the growing season, with approximately 9 percent of the TCE being transpired to the atmosphere. Plant tissue analysis revealed the expected metabolites (e.g., TCAA, dichloroacetic acid, DCE), but at very low concentrations.

4. **Aberdeen Proving Grounds: Edgewood Area J Fields Superfund Site - Edgewood, Maryland.** Weapons testing and past disposal activities at the Aberdeen Proving Grounds have resulted in extensive pollution of this site. Soil and groundwater contaminants include various chlorinated solvents, including trichloroethene (TCE). The site is being used to provide research information on phytoremediation; therefore, extensive monitoring is taking place. Vadose zone soil sampling is being performed for VOC concentrations, metals, and nutrients, and for the evidence of biodegradation activities; plant tissues are being analyzed for VOCs and degradation products; and 14 groundwater wells and four lysimeters are being analyzed for VOCs, metals, and nutrients. Groundwater monitoring data from May of 1997 indicated substantial groundwater uptake, resulting in a 2-foot water table depression beneath the trees. In addition, testing has shown successful transpiration of TCE from the leaves.

5. **Tibbetts Road Superfund Site - Barrington, New Hampshire.** From the 1940s to the present, this site was used as a storage area for industrial wastes from automobile production and painting. The activities led to groundwater contamination with various chlorinated hydrocarbons, including TCE and petroleum hydrocarbons. The site is located in a residential area and has affected private water supplies, leading to the issuance of a local ordinance that restricts the use of groundwater. The implementation of phytoremediation at this site was approved by the EPA in 1998, and the objectives are to provide vadose zone soil treatment and to hydraulically contain the groundwater plume. Monitoring will include measuring groundwater levels; groundwater sampling for terminal electron acceptors, degradation products, and field parameters (pH, dissolved oxygen); and soil sampling of root zone soil for various contaminants of concern.

6. **Carswell Air Force Base Superfund Site - Forth Worth, Texas.** Past activities at Air Force Plant #4 on this site have led to groundwater contamination. The shallow aquifer is contaminated with TCE, and a dissolved plume of TCE extends from the source area. A phytoremediation solution was implemented, with the objectives of containing the plume and reducing TCE concentrations in the groundwater. Monitoring activities at the site include the sampling of 29 groundwater wells for TCE and associated degradation products, groundwater elevation observation, and plant tissue analysis. Since the project was implemented in April of 1996, the water uptake demand of the trees exceeded the precipitation supply for the summer months, and TCE has been recovered from plant tissue, indicating successful uptake from the groundwater.

7. **Ashland Chemical – Milwaukee, Wisconsin.** Historical accidental spills at this chemical distribution facility resulted in soil and groundwater contamination with petroleum-related

organics, PAHs, and chlorinated organics. Phytoremediation was approved by Wisconsin regulators as the remedial solution. RMT, Inc., and Ecolotree, Inc., designed and installed (May, 2000) a 500-tree ECap/EBuffer, using 10- to 15-foot–tall hybrid poplar trees buried up to 10 feet below the surface and a subsurface aeration system (to encourage deep rooting into groundwater). Monitoring at the site includes continual depth to groundwater measurements, soil testing for residual organics, and data-logged soil moisture sensors.

A simple box model (calculations not shown) performed for the Ashland Chemical site suggests that transpiration of contaminants to the atmosphere does not pose an inhalation hazard. This conservative model, which assumes a transpiration rate of 25 gpd/tree, an aqueous contaminant concentration of 50 mg/L, a 30-foot mixing height, and a wind speed of 5 mph, predicts a worst-case atmospheric VOC concentration of only 0.05 ppb, which is six orders of magnitude less than the EPA workplace exposure limit of 100 ppm.

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REPORT NUMBER
H01-008-0505 PAGE 1
ACCOUNT NUMBER
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505 EAST WASHINGTON ST
SUITE 300
IOWA CITY, IA 52240

CLIENT:CRAB ORCHARD

REPORT OF ANALYSIS

REPORT DATE: 01/11/01
DATE RECEIVED: 01/10/01

LAB NO	SAMPLE ID	Chloride (Cl) ppm	NH4-N ppm
19146	E SWALE S W TRANSE CT	8	9.4
19147	W SWALE S W TRANSE CT	13	26.0
19148	E SWALE N W TRANSE CT	13	13.9
19149	W SWALE N W TRANSE CT	13	18.8
19150	E SWALE N E TRANSE CT	8	6.3
19151	W SWALE N E TRANSE CT	12	39.0
19152	E SWALE S E TRANSE CT	13	25.1
19153	W SWALE S E POINT	13	10.3

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David Klinkebiel

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SUITE 300
IOWA CITY, IA 52240

CLIENT: ECOLOTREE

REPORT OF ANALYSIS

REPORT DATE: 01/10/01
DATE RECEIVED: 01/08/01

LAB NO	SAMPLE IDENTIFICATION	PERCENT SAND	PERCENT SILT	PERCENT CLAY	TEXTURAL CLASSIFICATION
19146	E SWALE SW TRANS	14	59	27	SILTY LOAM
19147	W SWALE SW TRANS	12	63	25	SILTY LOAM
19148	E SWALE NW TRANS	12	63	25	SILTY LOAM
19149	W SWALE NW TRANS	12	65	23	SILTY LOAM
19150	E SWALE NE TRANS	12	71	17	SILTY LOAM
19151	W SWALE NE TRANS	12	65	23	SILTY LOAM
19152	E SWALE SE TRANS	14	69	17	SILTY LOAM
19153	W SWALE SE POINT	16	57	27	SILTY LOAM

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SOIL ANALYSIS

CLIENT	GROWER	
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LAB NUMBER 19146 SAMPLE ID E SWALE S W TRANSECT SIGNATURE

TEST	RESULTS	SOIL TEST RATINGS (Very Low / Low / Medium / Optimum / Very High)
Soil pH	6.4	
Buffer pH	7.05	
Phosphorus (P)	1 ppm	
Potassium (K)	72 ppm	
Calcium (Ca)	1128 ppm	
Magnesium (Mg)	571 ppm	
Sulphur (S)	10 ppm	
Boron (B)	0.2 ppm	
Copper (Cu)	0.7 ppm	
Iron (Fe)	29 ppm	
Manganese (Mn)	21 ppm	
Zinc (Zn)	0.2 ppm	
Sodium (Na)	112 ppm	
Soluble Salts	0.08 mmho/cm	
Organic Matter	1.2 %	
NO_3-N	4.17 ppm	

CATION EXCHANGE CAPACITY: 11.1 meq/100g

CATION SATURATION

%K	1.7
%Ca	50.8
%Mg	42.9
%H	.0
%Na	4.4

SOIL TEST METHOD

SOIL FERTILITY GUIDELINES

CROP: POPLAR TREES YIELD GOAL: PREV. CROP: COOL SEASON G
LB/ACRE

LIME	N	P_2O_5	K_2O	Mg	S	B	Cu	Mn	Zn
0	120	150	250	0	4	0.9	1	0	5

Cl 8 ppm Very Low Recommendation 44 lbs/acre Chloride Fert.
If Potash (KCL) is used as a Potassium source, enough
Chloride will be added to satisfy Chloride Fertility.
Soluble Salts Salinity Effects Mostly Negligible.

POPLAR TREES:
Apply 1/2 Nitrogen broadcast in spring and sidedress
the rest in June.
Apply all other nutrients broadcast prior to planting.

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SOIL ANALYSIS

CLIENT	GROWER	
ECOLOTREE 505 EAST WASHINGTON ST SUITE 300 IOWA CITY, IA 52240	CRAB ORCHARD DATE RECEIVED: 01/10/01	REPORT H01-008-0505 DATE 01/11/01 ACCOUNT 01851 PAGE 2 A&L AGRONOMIST David Klinkebiel

LAB NUMBER 19147 SAMPLE ID W SWALE S W TRANSECT SIGNATURE

TEST	RESULTS	SOIL TEST RATINGS (Very Low / Low / Medium / Optimum / Very High)
Soil pH	5.5	
Buffer pH	6.84	
Phosphorus (P)	2 ppm	
Potassium (K)	68 ppm	
Calcium (Ca)	1260 ppm	
Magnesium (Mg)	578 ppm	
Sulphur (S)	39 ppm	
Boron (B)	0.2 ppm	
Copper (Cu)	0.8 ppm	
Iron (Fe)	42 ppm	
Manganese (Mn)	16 ppm	
Zinc (Zn)	0.2 ppm	
Sodium (Na)	162 ppm	
Soluble Salts	0.24 mmho/cm	
Organic Matter	1.2 %	
NO_3-N	7.64 ppm	

CATION EXCHANGE CAPACITY: 13.9 meq/100g

CATION SATURATION

%K	1.3
%Ca	45.3
%Mg	34.7
%H	13.8
%Na	5.1

SOIL TEST METHOD

SOIL FERTILITY GUIDELINES

CROP: POPLAR TREES YIELD GOAL: PREV. CROP: COOL SEASON GI

LB/ACRE

LIME	N	P_2O_5	K_2O	Mg	S	B	Cu	Mn	Zn
331	120	150	250	0	0	0.9	1	0	5

Cl 13 ppm Very Low Recommendation 34 lbs/acre Chloride Fert.
If Potash (KCl) is used as a Potassium source, enough Chloride will be added to satisfy Chloride Fertility.
Soluble Salts Salinity Effects Mostly Negligible.

POPLAR TREES:
Apply 1/2 Nitrogen broadcast in spring and sidedress the rest in June.
Apply all other nutrients broadcast prior to planting.

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SOIL ANALYSIS

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LAB NUMBER 19148 SAMPLE ID E SWALE N W TRANSECT SIGNATURE

TEST	RESULTS	SOIL TEST RATINGS (Very Low / Low / Medium / Optimum / Very High)
Soil pH	7.0	
Buffer pH	7.19	
Phosphorus (P)	2 ppm	
Potassium (K)	71 ppm	
Calcium (Ca)	1443 ppm	
Magnesium (Mg)	556 ppm	
Sulphur (S)	25 ppm	
Boron (B)	0.2 ppm	
Copper (Cu)	1.1 ppm	
Iron (Fe)	55 ppm	
Manganese (Mn)	18 ppm	
Zinc (Zn)	0.8 ppm	
Sodium (Na)	170 ppm	
Soluble Salts	0.24 mmho/cm	
Organic Matter	1.3 %	
NO_3-N	5.05 ppm	

CATION EXCHANGE CAPACITY

12.8 meq/100g

CATION SATURATION

%K	1.4
%Ca	56.4
%Mg	36.2
%H	.0
%Na	5.8

SOIL TEST METHOD

SOIL FERTILITY GUIDELINES

CROP: POPLAR TREES YIELD GOAL: PREV. CROP: COOL SEASON G

LB/ACRE

LIME	N	P_2O_5	K_2O	Mg	S	B	Cu	Mn	Zn
0	120	150	250	0	0	0.9	0	0	0

Cl 13ppm Very Low Recommendation 34 lbs/acre Chloride Fert.
If Potash (KCl) is used as a Potassium source, enough Chloride will be added to satisfy Chloride Fertility.
Soluble Salts Salinity Effects Mostly Negligible.

POPLAR TREES:
Apply 1/2 Nitrogen broadcast in spring and sidedress the rest in June.
Apply all other nutrients broadcast prior to planting.

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SOIL ANALYSIS

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LAB NUMBER 19149 SAMPLE ID W SWALE N W TRANSECT SIGNATURE

TEST	RESULTS	SOIL TEST RATINGS (Very Low / Low / Medium / Optimum / Very High)
Soil pH	5.8	
Buffer pH	6.96	
Phosphorus (P)	3 ppm	
Potassium (K)	52 ppm	
Calcium (Ca)	969 ppm	
Magnesium (Mg)	500 ppm	
Sulphur (S)	84 ppm	
Boron (B)	0.1 ppm	
Copper (Cu)	0.7 ppm	
Iron (Fe)	34 ppm	
Manganese (Mn)	22 ppm	
Zinc (Zn)	0.2 ppm	
Sodium (Na)	226 ppm	
Soluble Salts	0.43 mmho/cm	
Organic Matter	1.1 %	
NO_3-N	6.88 ppm	

CATION EXCHANGE CAPACITY: 10.6 meq/100g

CATION SATURATION

%K	1.3
%Ca	45.7
%Mg	39.3
%H	4.5
%Na	9.3

SOIL TEST METHOD

SOIL FERTILITY GUIDELINES

CROP: POPLAR TREES YIELD GOAL: PREV. CROP: COOL SEASON GI

LB/ACRE

LIME	N	P_2O_5	K_2O	Mg	S	B	Cu	Mn	Zn
0	120	150	250	0	0	1.0	1	0	5

Cl 13ppm Very Low Recommendation 34 lbs/acre Chloride Fert.
If Potash (KCl) is used as a potassium source, enough
Chloride will be added to satisfy Chloride Fertility.
Soluble Salts Very slightly Saline: yields of very salt sensitive crops

POPLAR TREES:
Apply 1/2 Nitrogen broadcast in spring and sidedress
the rest in June.
Apply all other nutrients broadcast prior to planting.

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LAB NUMBER 19150 SAMPLE ID E SWALE N E TRANSECT SIGNATURE

TEST	RESULTS	SOIL TEST RATINGS (Very Low / Low / Medium / Optimum / Very High)
Soil pH	7.4	
Buffer pH	7.18	
Phosphorus (P)	7 ppm	
Potassium (K)	36 ppm	
Calcium (Ca)	840 ppm	
Magnesium (Mg)	319 ppm	
Sulphur (S)	20 ppm	
Boron (B)	0.5 ppm	
Copper (Cu)	0.9 ppm	
Iron (Fe)	66 ppm	
Manganese (Mn)	26 ppm	
Zinc (Zn)	0.6 ppm	
Sodium (Na)	164 ppm	
Soluble Salts	0.17 mmho/cm	
Organic Matter	1.2 %	
NO_3-N	4.47 ppm	

CATION EXCHANGE CAPACITY

7.7 meq/100g

CATION SATURATION

%K	1.2
%Ca	54.5
%Mg	34.5
%H	.0
%Na	9.3

SOIL TEST METHOD

SOIL FERTILITY GUIDELINES

CROP: POPLAR TREES YIELD GOAL: PREV. CROP: COOL SEASON G

LB/ACRE

LIME	N	P_2O_5	K_2O	Mg	S	B	Cu	Mn	Zn
0	120	150	300	0	0	0.7	1	0	1

Cl 8 ppm Very Low Recommendation 44 lbs/acre Chloride Fert.
If Potash (KCl) is used as a Potassium Source, enough
Chloride will be added to satisfy Chloride Fertility.
Soluble Salts Salinity Effects Mostly Negligible.

POPLAR TREES:
Apply 1/2 Nitrogen broadcast in spring and sidedress
the rest in June.
Apply all other nutrients broadcast prior to planting.

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SOIL ANALYSIS

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LAB NUMBER 19151 SAMPLE ID W SWALE N E TRANSECT SIGNATURE

TEST	RESULTS	SOIL TEST RATINGS (Very Low / Low / Medium / Optimum / Very High)
Soil pH	5.1	
Buffer pH	6.42	
Phosphorus (P)	4 ppm	
Potassium (K)	55 ppm	
Calcium (Ca)	599 ppm	
Magnesium (Mg)	270 ppm	
Sulphur (S)	38 ppm	
Boron (B)	0.2 ppm	
Copper (Cu)	0.8 ppm	
Iron (Fe)	129 ppm	
Manganese (Mn)	40 ppm	
Zinc (Zn)	0.3 ppm	
Sodium (Na)	127 ppm	
Soluble Salts	0.20 mmho/cm	
Organic Matter	1.7 %	
NO_3-N	9.51 ppm	

CATION EXCHANGE CAPACITY

12.9 meq/100g

CATION SATURATION

%K	1.1
%Ca	23.2
%Mg	17.4
%H	54.0
%Na	4.3

SOIL TEST METHOD

SOIL FERTILITY GUIDELINES

CROP: POPLAR TREES YIELD GOAL: PREV. CROP: COOL SEASON GF

LIME	N	P_2O_5	K_2O	Mg	S	B	Cu	Mn	Zn
3380	120	150	250	0	0	0.9	1	0	5

LB/ACRE

Cl 12 ppm Very Low Recommendation 36 lbs/acre Chloride Fert.
If Potash (KCl) is used as a Potassium source, enough
Chloride will be added to satisfy Chloride Fertility.
Soluble Salts Salinity Effects Mostly Negligible.

POPLAR TREES:
Apply 1/2 Nitrogen broadcast in spring and sidedress
the rest in June.
Apply all other nutrients broadcast prior to planting.

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SOIL ANALYSIS

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LAB NUMBER 19152 SAMPLE ID E SWALE S E TRANSECT SIGNATURE

TEST	RESULTS	SOIL TEST RATINGS (Very Low / Low / Medium / Optimum / Very High)
Soil pH	7.3	
Buffer pH	7.31	
Phosphorus (P)	5 ppm	
Potassium (K)	39 ppm	
Calcium (Ca)	945 ppm	
Magnesium (Mg)	313 ppm	
Sulphur (S)	55 ppm	
Boron (B)	0.6 ppm	
Copper (Cu)	0.8 ppm	
Iron (Fe)	44 ppm	
Manganese (Mn)	33 ppm	
Zinc (Zn)	0.6 ppm	
Sodium (Na)	304 ppm	
Soluble Salts	0.38 mmho/cm	
Organic Matter	1.1 %	
NO_3-N	3.62 ppm	

CATION EXCHANGE CAPACITY: 8.8 meq/100g

CATION SATURATION

%K	1.1
%Ca	53.7
%Mg	29.6
%H	.0
%Na	15.0

SOIL TEST METHOD

SOIL FERTILITY GUIDELINES

CROP: POPLAR TREES YIELD GOAL: PREV. CROP: COOL SEASON

LIME	N	P_2O_5	K_2O	Mg	S	B	Cu	Mn	Zn
0	120	150	300	0	0	0.6	1	0	1

Cl 13 ppm Very Low Recommendation 34 lbs/acre Chloride Fert.
If Potash (KCl) is used as a Potassium source, enough Chloride will be added to satisfy Chloride Fertility.
Soluble Salts Salinity Effects Mostly Negligible.

POPLAR TREES:
Apply 1/2 Nitrogen broadcast in spring and sidedress the rest in June.
Apply all other nutrients broadcast prior to planting.

A&L Heartland Laboratories, Inc.

P.O. Box 455 • 111 Linn Street • Atlantic, IA 50022-0455 • (712) 243-6933 • FAX (712) 243-5213

SOIL ANALYSIS

CLIENT	GROWER	
ECOLOTREE 505 EAST WASHINGTON ST SUITE 300 IOWA CITY, IA 52240	CRAB ORCHARD DATE RECEIVED: 01/10/01	REPORT H01-008-0505 DATE 01/11/01 ACCOUNT 01851 PAGE 8 A&L AGRONOMIST David Klinkebiel

LAB NUMBER 19153 SAMPLE ID W SWALE S E POINT SIGNATURE

TEST	RESULTS	SOIL TEST RATINGS (Very Low / Low / Medium / Optimum / Very High)
Soil pH	7.2	
Buffer pH	7.18	
Phosphorus (P)	1 ppm	
Potassium (K)	60 ppm	
Calcium (Ca)	1276 ppm	
Magnesium (Mg)	556 ppm	
Sulphur (S)	10 ppm	
Boron (B)	0.2 ppm	
Copper (Cu)	0.6 ppm	
Iron (Fe)	19 ppm	
Manganese (Mn)	19 ppm	
Zinc (Zn)	0.2 ppm	
Sodium (Na)	169 ppm	
Soluble Salts	0.09 mmho/cm	
Organic Matter	1.1 %	
NO_3-N	6.64 ppm	

CATION EXCHANGE CAPACITY: 11.9 meq/100g

CATION SATURATION

%K	1.3
%Ca	53.6
%Mg	38.9
%H	.0
%Na	6.2

SOIL TEST METHOD

SOIL FERTILITY GUIDELINES

CROP: POPLAR TREES YIELD GOAL: PREV. CROP: COOL SEASON GF

LIME	N	P_2O_5	K_2O	Mg	S	B	Cu	Mn	Zn
0	120	150	250	0	4	0.9	2	0	5

LB/ACRE

Cl 13 ppm Very Low Recommendation 34 lbs/acre Chloride Fert.
If Potash (KCl) is used as a Potassium source, enough
Chloride will be added to satisfy Chloride Fertility.
Soluble Salts Salinity Effects Mostly Negligible.

POPLAR TREES:
Apply 1/2 Nitrogen broadcast in spring and sidedress
the rest in June.
Apply all other nutrients broadcast prior to planting.

Appendix S
Water Quality Criteria

Crab Orchard Superfund Site (Williamson (?)); Paul Lake, 8-13-99;
wqc for variety of substances

	CAS#	AATC	CATC	HH	
1,2-dichloroethylene	540-59-0	(14)	(1.1)mg/L	-	-
1,2-dichloroethylene	540-59-0	(14)	(1.1)m	-	-
1,2-dichlorobenzene	95-50-1	210	170 u	5.5 mg	(HTC)
trans-1,2-dichloroethylene	156-60-5	-	-	34 mg	(HTC)
cis-1,2-dichloroethylene	no separate criteria, see above				
tetrachloroethylene	127-18-4	1.2	0.15 m	2.8 ug	(HNC)
trichloroethylene	79-01-6	12	0.94 m	25 ug	(HNC)
toluene	108-88-3	1300	110 u	62 mg	(HTC)
vinyl chloride	75-01-4	(40)	(4) m	120 ug	(HNC)
xylene(s)	1330-20-7	1.5	0.12 m	62 mg	(HTC)
2-chlorophenol	95-57-8	510	41 u	130 ug	(HTC)
3-methyl-4-chlorophenol	59-50-7	310	25 u	-	
2,4-dimethylphenol	105-67-9	740	220 u	740 ug	(HTC)
chlorinated-p-dioxins	no criteria				
chlorinated dibenzofurans	no criteria				
phenol		0.1 mg/L	-	302.208g)	
naphthalene	91-20-3	510	68 u	-	
PCBs	1336-36-3	-	-	1.5X10-5 ug	(HNC)
cadmium		9.7	1.1 u	302.208e)	
chromium +3		1.7	0.21 mg	302.208e)	
chromium +6		16	11 u	302.208e)	
copper		18	12 u	302.208e)	
iron		1 m	-	302.208g)	
lead		96	20 m	302.208e)	

AATC acute aq life; CATC chronic aq life
( ) " advisory" (not enough data for legal criterion)

Appendix T
Pilot Test Calculations

RMT
744 Heartland Trail
Madison, WI 53717-1934
Tel. (608) 831-4444 • Fax (608) 831-3334

SHEET____ OF ____

PROJECT / PROPOSAL NAME / LOCATION: Crab Orchard NWR			PROJECT / PROPOSAL NO. 4781.07
SUBJECT: VOCs mass removal			
PREPARED BY: Dan Hook	DATE: 12/19/00		FINAL ☐
CHECKED BY: BSS	DATE: 12/21/00		REVISION ☐

Area 9 Repository (MPE)

Water: Average extraction rate = 0.34 gpm
Average Total VOCs Concentration = 959.9 µg/L
Total time of MPE pilot test = 89.1 hours

$$\text{Average VOCs mass removal} = \frac{0.34\,gal}{min}\left|\frac{959.9\,\mu g}{L}\right|\frac{g}{10^6\,\mu g}\left|\frac{lb}{453\,g}\right|\frac{60\,min}{hr}\left|\frac{3.785\,L}{gal}\right. = 0.00016\,\frac{lbs}{hr}$$

$$\text{Total VOCs removed (via water)} = \left(0.00016\,\frac{lb}{hr}\right)(89.1\,hr) = 0.014\ lbs$$

Air: Average extraction rate = 27.3 scfm
Average Total VOCs Concentration = 82108 µg/m³
Total time of MPE pilot test = 89.1 hrs.

$$\text{Average VOCs mass removal} = \frac{27.3\,ft^3}{min}\left|\frac{82108\,\mu g}{m^3}\right|\frac{g}{10^6\,\mu g}\left|\frac{60\,min}{hr}\right|\frac{lb}{453\,g}\left|\frac{m^3}{35.3\,ft^3}\right. = 0.0084\,\frac{lb}{hr}$$

$$\text{Total VOCs removed (via air)} = \left(0.0084\,\frac{lb}{hr}\right)(89.1\,hr) = 0.75\ lbs$$

FORM 383A

744 Heartland Trail
Madison, WI 53717-1934
Tel. (608) 831-4444 • Fax (608) 831-3334

SHEET____ OF ____

PROJECT / PROPOSAL NAME / LOCATION: Crab Orchard NWR			PROJECT / PROPOSAL NO. 4781.07
SUBJECT: VOCs mass removal			
PREPARED BY: Dan Haak	DATE: 12/20/00		FINAL ☐
CHECKED BY: BBS	DATE: 12/21/00		REVISION ☐

Building I-1-23 (MPE)

Water: Average extraction rate = 6.27 gpm
Average VOCs Concentration = 949.3 µg/L
Total time of MPE pilot test = 77 hours

$$\text{Average VOCs mass removal} = \frac{6.27\ gal}{min} \cdot \frac{949.3\ \mu g}{L} \cdot \frac{g}{10^6\ \mu g} \cdot \frac{lb}{453\ g} \cdot \frac{60\ min}{hr} \cdot \frac{3.785\ L}{gal} = 0.0030\ \frac{lb}{hr}$$

$$\text{Total VOCs removed (water)} = (0.0030\ lb/hr)(77\ hr) = 0.23\ lbs.$$

Air: Average extraction rate = 17.9 scfm
Average VOCs Concentration = 95507.8 µg/m³
Total time of MPE pilot test = 77 hours

$$\text{Average VOCs mass removal} = \frac{17.9\ ft^3}{min.} \cdot \frac{95507.8\ \mu g}{m^3} \cdot \frac{g}{10^6\ \mu g} \cdot \frac{60\ min}{hr} \cdot \frac{lb}{453\ g} \cdot \frac{m^3}{35.3\ ft^3} = 0.0064\ \frac{lb}{hr}$$

$$\text{Total VOCs removed (air)} = (0.0064\ \frac{lb}{hr})(77\ hr) = 0.49\ lbs.$$

FORM 3E1A

RMI
744 Heartland Trail
Madison, WI 53717-1934
Tel. (608) 831-4444 • Fax (608) 831-3334

SHEET_____ OF _____

PROJECT / PROPOSAL NAME / LOCATION: Crab Orchard NWR		PROJECT / PROPOSAL NO.
SUBJECT: VOCs mass removal		4781.07
PREPARED BY: Dan Hack	DATE: 12/20/00	FINAL ☐
CHECKED BY: BSS	DATE: 12/21/00	REVISION ☐

Building I-1-23 (SVE)

No water extracted

Air: Average extraction rate = 38.8 scfm
Average VOCs Concentration = 13475 $\mu g/m^3$
Total time of SVE pilot test = 44.5 hrs.

$$\text{Average VOCs mass removal} = \frac{38.8\,ft^3}{min} \cdot \frac{13475\,\mu g}{m^3} \cdot \frac{g}{10^6\,\mu g} \cdot \frac{60\,min}{hr} \cdot \frac{lb}{453\,g} \cdot \frac{m^3}{35.3\,ft^3} = 0.0019\ \frac{lb}{hr}$$

$$\text{Total VOCs removed} = \left(0.0019\,\frac{lb}{hr}\right)(44.5\,hr) = 0.086\ lb$$

Building I-1-2 (SVE)

No water extracted

Air: Average extraction ration rate = 60.8 scfm
Average VOCs Concentration = 2135 $\mu g/m^3$
Total time of SVE pilot test = 46 hrs

$$\text{Average VOCs mass removal} = \frac{60.8\,ft^3}{min} \cdot \frac{2135\,\mu g}{m^3} \cdot \frac{g}{10^6\,\mu g} \cdot \frac{60\,min}{hr} \cdot \frac{lb}{453\,g} \cdot \frac{m^3}{35.3\,ft^3} = 0.00049\ \frac{lb}{hr}$$

$$\text{Total VOCs removed} = \left(0.00049\,\frac{lb}{hr}\right)(46\,hr) = 0.022\ lb$$

FORM 383A

RMT
744 Heartland Trail
Madison, WI 53717-1934
Tel. (608) 831-4444 • Fax (608) 831-3334

SHEET ____ OF ____

PROJECT / PROPOSAL NAME / LOCATION: CONWR		PROJECT / PROPOSAL NO. 4781.07
SUBJECT: VOCs Mass Breakthru		
PREPARED BY: Dan Haak	DATE: 12/14/00	FINAL ☐
CHECKED BY: BSS	DATE: 12/22/00	REVISION ☐

MPE-Repository

Minimum 10/21/00 8:25 100 $\mu g/m^3$ VOCs
Maximum 311 $\mu g/m^3$ VOCs
airflow rate = 5.1 ft^3/min

?. ok

Min. $\frac{5.1\,ft^3}{min} \cdot \frac{100\,\mu g}{m^3} \cdot \frac{g}{10^6\,\mu g} \cdot \frac{60\,min}{hr} \cdot \frac{lb}{453.6\,g} \cdot \frac{m^3}{35.3\,ft^3} = 0.0000019 \frac{lb\ VOCs}{hr}$ or $0.000046 \frac{lb\ VOCs}{day}$

Max. $3.11 \times .0000019 = .0000059 \frac{lb\ VOCs}{hr}$ or $.00014 \frac{lb\ VOCs}{day}$

MPE - I-1-23

Minimum 10/25/00 15:00 260 $\mu g/m^3$ VOCs
Maximum 701 $\mu g/m^3$ VOCs
airflowrate = 19.5 ft^3/min

?

Min. $\left(\frac{19.5\,ft^3}{min}\right)\left(\frac{260\,\mu g}{m^3}\right)\left(\frac{g}{10^6\,\mu g}\right)\left(\frac{60\,min}{hr}\right)\left(\frac{lb}{453.6\,g}\right)\left(\frac{m^3}{35.3\,ft^3}\right) = .000019 \frac{lb\ VOCs}{hr}$ or $.00046 \frac{lb\ VOCs}{day}$

Max. $\left(\frac{701}{260}\right) \times .000019 = .000051 \frac{lb\ VOCs}{hr}$ or $.0012 \frac{lb\ VOCs}{day}$

- PID samples were all <1 ppm at effluent sampling port.
- No detects found in effluent during SVE at I-1-2

2 Carbon canisters from Repository were moved to I-1-2

2 Carbon canisters at I-1-23 were used for SVE then MPE tests

4 carbon canisters were unused

8 total canister on-site

6/6

FORM 383A

Appendix U
Evaluation of Data Quality and Summary Tables for Validated Laboratory Data

Integrated Environmental Solutions

744 Heartland Trail 53717-1934
P.O. Box 8923 53708-8923
Madison, WI
Telephone: 608-831-4444
Fax: 608-831-3334

EVALUATION OF DATA QUALITY FROM ANALYSES OF SAMPLES COLLECTED FOR THE GROUNDWATER REMEDIAL ACTION PRE-DESIGN FIELDWORK

REVISION 0

CRAB ORCHARD NATIONAL WILDLIFE REFUGE
PCB OPERABLE UNIT
MARION, ILLINOIS

PREPARED BY
RMT, INC.
MADISON, WISCONSIN

May 2001

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b

Section 1
Introduction

1.1 Background

This report presents the findings of the data validation that included a systematic review of the analytical data for compliance with the procedures and criteria established in the Pre-Design Workplan for the Groundwater Remedial Action, Revision 1 (RMT, 2000b); the Field Sampling and Analysis Plan (FSP; RMT, 2000a); and the Quality Assurance Project Plan (QAPP; RMT, 2000c). This evaluation details the Quality Control (QC) activities and actions regarding specific QC criteria exceedences. It also addresses the overall quality and usability of the data for the purposes of the Remedial Action Preliminary Design.

RMT, Inc. (RMT), collected soil and groundwater samples at Sites 32/33 in September 2000. The sampling program and procedures were performed in accordance with the Workplan (RMT, 2000b), the FSP (RMT, 2000a), and the QAPP (RMT, 2000c) approved by the United States Environmental Protection Agency (USEPA), Region 5. Primary field samples included a total of 377 soil samples that were analyzed for volatile organic compounds (VOCs) in the on-site laboratory. Confirmatory analysis of VOCs was performed in the off-site laboratory for a portion (55 samples) of the samples. A total of 27 groundwater samples from soil borings and monitoring wells were analyzed at the off-site laboratory for VOCs and inorganic indicator parameters. Field quality control samples were also collected in accordance with the approved workplans.

The on-site mobile laboratory analyses were performed by Environmental Chemistry Consulting Services, Inc. (ECCS). Severn Trent Laboratories, Inc., in North Canton, Ohio, and Austin, Texas (STL North Canton and STL Austin), performed the off-site analyses of soil and groundwater samples. The samples were organized into several Sample Delivery Groups (SDGs) for laboratory analysis and reporting.

1.2 Summary of Data Validation Procedures

The data generated for the pre-design program were assessed for technical credibility, usability, and compliance with the procedures and QC criteria established in the analytical methods and laboratory Standard Operating Procedures (SOPs) described in the QAPP.

Data validation demonstrated that all data are usable for the purposes defined in the Workplan. The data quality objectives (DQOs) for definitive-level data specified in the QAPP were

attained, the specified Quantitation Limits were achieved, and the sample holding times were met, except where indicated otherwise. The generated data met the completeness required by the QAPP. The procedures specified in the QAPP were implemented, and all deliverables specified in the QAPP were included in the data packages. Data accuracy, precision, sensitivity, and completeness were assessed based on method-specific criteria and USEPA data validation guidance documents.

All analytical forms were checked for the following information: raw data, including chromatograms, quantitation reports, data system printouts, and mass spectra for samples, standards, blanks, and laboratory spikes/laboratory duplicates or matrix spike/matrix spike duplicates (MS/MSDs). Portions of the calculations, such as spike recoveries, calibration response factors, analyte quantitation, etc., were randomly spot-checked.

This data validation report documents the results of the data review for acceptable analytical reporting. The assessment compares calibrations, instrument performance, compound identification and quantitation, and QC checks (blanks, spikes, internal standards, duplicates, laboratory control samples, serial dilutions) with established acceptance criteria. The frequency at which these performance measures were made was compared with the requirements specified in the approved laboratory SOPs. Specific QC criteria exceedences and their effect on the data quality were identified by data qualifiers.

Section 2
Summary of Sampling Program

In September and October 2000, RMT, Inc. (RMT), collected soil and groundwater samples at Sites 32/33 of the PCB Operable Unit as part of the pre-design fieldwork program for the groundwater remedial action.

The sampling program and procedures were performed in accordance with a Workplan (RMT, 2000) approved by the United States Environmental Protection Agency (USEPA). Field samples included 377 soil samples analyzed in the mobile laboratory, 55 soil samples analyzed in the fixed-based off-site laboratory, and 27 groundwater samples analyzed in the off-site laboratory. Only a cursory data review was performed on the results from the analysis of water and air samples collected during the pilot tests, and on the results from the analysis of the investigative-derived waste samples (soil and wastewater). This data validation report does not discuss those samples.

The on-site mobile laboratory analyses were performed in accordance with ECCS's Standard Operating Procedures (SOPs), in conjunction with Method 5035 (SW-846). ECCS's SOPs for the Mobile Laboratory include details for the purge and trap analysis of VOCs using Gas Chromatography (GC) with Photo-Ionization and/or Electrolytic Conductivity Detectors (PID/ELCD). To delineate samples with different levels of VOC contamination, ECCS was using two instruments during the mobile laboratory analysis of VOCs. To discern soil with VOCs at concentrations of greater than 1 mg/kg, a GC with a Flame Ionization Detector (FID) with direct injection of the methanol extracts was employed prior to the GC/PID/ELCD. The samples with observed concentrations were then subjected to VOC analysis by the purge and trap using GC/PID and ELCD.

The off-site laboratory (STL North Canton) analyzed the soil samples using Method 8260B in conjunction with Method 5035 (SW-846). Water samples were analyzed for VOCs in accordance with the Contract Laboratory Program Statement of Work (CLP SOW) OLC02.1. The laboratory analyzed water samples for general wet chemistry parameters alkalinity, ammonia-nitrogen, chloride, nitrate and nitrite as nitrogen, sulfate, total dissolved solids (TDS), and total organic carbon (TOC) using published methods (e.g., EPA 600) and Laboratory SOPs. STL Austin analyzed the water samples for dissolved gases in accordance with a laboratory SOP.

Field quality control samples, including trip blanks, field duplicates, and matrix spikes/matrix spike duplicates (MSs/MSDs), were collected in accordance with the approved Workplan.

Section 3
Data Quality Evaluation

Data validation was accomplished by comparing the quality assurance and quality control (QA/QC) results contained in the laboratory data packages with the requirements specified in the approved Quality Assurance Project Plan (RMT, 2000c); the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA, 1994); the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA, 1999); and the general guidelines published in EPA 600, Methods for Chemical Analysis of Water and Waste, EPA 600/4-79-020 (USEPA, 1983) with subsequent revisions, where appropriate. Particular attention was paid to raw data, chain-of-custody forms, initial and continuing calibrations, blanks, laboratory control samples (LCSs), MS/MSDs, and spike and duplicate analyses. The discussion that follows describes the QA/QC results and evaluation.

3.1 Usability

The data quality objectives for the project were met, and the data are usable for the purposes as defined in the approved workplan. The procedures specified in the methods were implemented, and the data packages were found to contain all of the deliverables specified in the QAPP.

3.2 Sample Tracking

Laboratory reports received from STL were compared with shipping records to confirm that results were received for each sample that was shipped. All of the results for all sampling locations were received.

3.3 Holding Times and Sample Preservation

Required holding times were met, with the following exceptions. As an additional screening, ECCS analyzed 24 "extra" soil samples in the mobile laboratory using the GC/FID only. These samples were preserved outside the Method 5035 recommended 48-hour holding time for VOC preservation. However, they were analyzed within 14 days. ECCS qualified all detections in these samples with an "F" flag. A data validation qualifier (j) was also added to the sample detections to indicate estimated results. The analysis of TDS from sample GW-32/00-504-001015 was initiated within the 7-day holding time, but it was completed 1 day past the holding

time. This exceedence is not believed to have affected the TDS result significantly, and no action was taken.

The VOC analyses in the on-site mobile laboratory were preserved and analyzed immediately upon receipt of samples by the on-site analyst. VOC analyses in the off-site laboratory were performed within 14 days of sample collection. Metals were analyzed within the 6-month time requirement. Alkalinity analyses were performed within 14 days of sample collection. TDS was analyzed within 7 days; and chloride, nitrogen species, sulfate, and TOC were analyzed within 28 days of sample collection.

3.4 Instrument Performance Check

Satisfactory gas chromatograph/mass spectrometer (GC/MS) instrument performance checks ensure adequate mass resolution, compound identification, and, to some degree, sensitivity. The criteria established for instrument performance checks were met at all times. The analyses of the instrument performance check solutions were performed at the required frequency (every 12 hours of sample analysis per instrument). Bromofluorobenzene (BFB) was used as the check compound in VOC analysis.

The ion abundance ratio, signal-to-noise ratio, retention times, and the mass assignment criteria were met for all instrument performance checks. The ion abundances were correctly normalized to the appropriate m/z (mass/charge) ratio.

3.5 Calibrations

Initial calibration establishes that the instrument is capable of acceptable performance at the beginning of the analytical sequence and that the calibration curve is linear. Continuing calibration verifies the calibration and evaluates daily instrument performance.

3.5.1 GC/MS Calibration

Initial calibrations containing target compounds and system monitoring compounds were performed at the required frequency and concentration levels. Initial calibrations of the GC/MS at five concentrations were performed after instrument performance check criteria were met and prior to the analysis of samples and blanks. Internal standards were added to all calibration standards and samples (including blanks and MS/MSD). The GC/MS calibration was verified every 12 hours with one mid-range standard.

The minimum relative response factor (RRF) criterion was met in the GC/MS analyses. The stability of the compound response factors was indicated by acceptable percent

relative standard deviation (%RSD) values of the RRFs. The percent difference (% D) criteria for continuing calibration were met.

3.5.2 GC Calibration

During the GC/ELCD, GC/FID, and GC/PID analysis of VOCs in the mobile laboratory, ECCS analyzed blanks and calibration standards during the initial calibration sequence using a 5-point initial calibration of the standard mixture of select VOCs. Continuing calibration, including the analysis of blanks, was performed with the mid-point standard after the analysis of 10 or fewer samples to verify the calibration and evaluate instrument performance.

During the GC/FID analysis, STL Austin performed a 7-point initial calibration of the dissolved gases (methane, ethane, and ethene). Continuing calibration, including the analysis of blanks, was performed once every 12-hour analytical period. All GC calibration results were acceptable. Good peak resolution was achieved, and RTs (retention times) of the analytical constituents and surrogates were within the correct RT windows. Overall, acceptable instrument stability and performance were maintained in the GC analyses.

3.5.3 Inorganic Calibration

Initial calibrations and continuing calibration verifications, including initial and continuing calibration blanks, were performed at the required frequency and concentration level as specified in the methods. All calibration results were within QC acceptance criteria.

3.6 Internal Standard Responses and Retention Times in the GC/MS Analysis

The quantitative determination of the VOCs is based on the use of internal standards added immediately prior to analysis. Therefore, satisfactory internal standard responses in all calibration standards, samples, and blanks are critical.

ECCS used 2-bromo-1-chloropropane as an internal standard in the GC/ELCD analysis, and fluorobenzene as an internal standard in the GC/PID analysis with acceptable results.

STL used three internal standard constituents (1,4-dichlorobenzene-d4; fluorobenzene; and chlorobenzene-d5) in the GC/MS analysis of VOCs. All internal standard area counts and retention times (RTs) were within the QC limits.

3.7 Compound Identification and Quantitation

To verify that VOCs were not erroneously identified, the retention times (RTs) of the samples were checked to see if they were within the standard RT and if the mass spectra of the samples and standards matched in the GC/MS analysis. The ion abundance ratio and response factor criteria were met.

The QC criteria of the GC analyses were acceptable: the retention times of the surrogates, matrix spikes, and analytical compounds were within the correct RT windows. The samples were diluted if off-scale chromatographic peaks were present.

During the analysis of VOCs in the on-site mobile laboratory, GC/FID was used to screen samples and discern elevated concentrations of VOCs. Some of the reported VOC results are based on GC/FID analysis when the VOC concentration was greater than 1 mg/kg. ECCS indicated these analysis results with an "F" qualifier. During the early phase of the project, chlorinated VOC results were quantified using the initial calibration of the GC/ELCD. The GC/PID was used to quantify the nonchlorinated constituents. Because of the noted better performance of the GC/PID, and the absence of potential interferences with the GC/PID, chlorinated VOCs were later quantified using the GC/PID data. All samples were also analyzed using the GC/ELCD for confirmation.

Tentatively identified compounds (TICs) were reported from some samples analyzed by STL for VOCs. The identification and quantitation of 1,4-dichlorobenzene; 1,2,3-trichlorobenzene; and 1,2,4-trichlorobenzene that were reported as TICs, were based on the calibration of these constituents. The other TICs were identified using mass spectral library search and quantitation using the nearest internal standard and a response factor of 1. Occasionally, a method blank contained a TIC constituent.

3.8 Method Blanks and Preparation Blanks

Method blanks and preparation blanks were analyzed to assess potential sample contamination resulting from laboratory procedures. A method or preparation blank (procedural blank) is carried through the same analytical steps (preparation and analysis) as the samples.

One or two method blanks were analyzed daily in the on-site mobile laboratory. Vinyl chloride and tetrachloroethene (PCE) were reported in some method blanks. The reports of vinyl chloride were a result of a baseline interference at the GC retention time of vinyl chloride. ECCS investigated the source for the PCE detections in the method blanks. However, the source remains unknown. ECCS qualified the affected vinyl chloride and PCE results in the sample with a "B" qualifier. A data validation qualifier (u) was also added to indicate that the sample results should be considered as nondetected. A "j" qualifier was added to samples

SB-127-H, SB-127-J, and SB-127-H Dup (=Fdup 023) for vinyl chloride to indicate that the sample detections should be considered suspect. O-Xylene was detected in one method blank at a low level. ECCS qualified associated sample results with a "B" qualifier, and some sample results were considered as nondetected (u) during data validation.

A total of eighteen method blanks were analyzed by STL for VOCs in water. Low levels of methylene chloride were detected in two method blanks. Benzene; 1,4-dichlorobenzene; and tetrachloroethene (PCE) were each detected in one method blank in water. One tentatively identified compound (TIC) was also detected in two method blanks in water.

Eleven method blanks were analyzed for VOCs in soil. Acetone was detected in nine method blanks, and methylene chloride was detected in three method blanks in soil. One tentatively identified compound (TIC) was also detected in two method blanks in soil.

Seven method blanks were analyzed for dissolved gases. Six to eight preparation blanks were analyzed for the same wet chemistry parameters as the samples. No methane, ethane, ethene, or wet chemistry parameters were detected in these blanks above reporting limits.

Data validation qualifiers were added to the sample data on the basis of blank contamination. When the concentrations of the common laboratory contaminants, acetone and methylene chloride, in the sample were less than 10 times the associated blank value, and when the concentrations of other constituents in the sample were less than five times the associated blank value, the sample results were qualified as nondetected ("u") in accordance with USEPA (1999) data validation guidance.

3.9 Trip Blanks

To assess the potential for sample contamination during sample collection, shipment, and storage, 13 trip blanks were analyzed for VOCs. Low levels of carbon disulfide and chloromethane were detected in two trip blanks; and low levels of acetone, bromodichloromethane, methylene chloride, and a TIC were each detected in one trip blank. Data validation qualifiers were added to the sample data on the basis of trip blank detections (see above). Some trip blank constituents were also qualified as nondetected on the basis of method and/or holding blank detections.

3.10 Holding/Storage Blanks

ECCS analyzed nine VOC holding/storage blanks in the on-site mobile laboratory to assess potential sample contamination during sample storage. One of the nine blanks contained benzene and TCE as a result of instrument carry-over. No other VOCs were detected in the holding blanks in the mobile laboratory.

STL analyzed three laboratory holding/storage blanks for VOCs. Low levels of methylene chloride were detected in two holding blanks. Two TICs were detected in one holding blank. Data validation qualifiers were added to the sample results on the basis of holding blank detections (see above).

3.11 Matrix Spikes/Matrix Spike Duplicates

Matrix spikes (MSs) and matrix spike duplicates (MSDs) provide information about the effects of the sample matrix on the sample preparation and measurement performance. A matrix spike consists of a sample that is spiked with a group of target constituents representative of the method analytes and carried through the appropriate steps of the analysis, including extraction, distillation, and digestion. Laboratory control sample analyses were performed for low-level VOCs in water rather than the MS/MSD analysis, in accordance with the method specifications.

All analytical constituents were injected into 18 MS/MSD samples and one MS sample for VOCs analyzed in the on-site mobile laboratory using GC/FID, GC/ELCD, and GC/PID. The MS recovery of vinyl chloride from sample SB32/33-405-E was below 60 percent. The MS and MSD recoveries of vinyl chloride from samples SB32/33-207-E and SB32/33-209-E were below 60 percent. All other associated quality control data were acceptable. No action was taken during data validation on the basis of MS/MSD results alone.

During the analyses in the off-site laboratory, five spike compounds were used in 13 MS/MSD analyses performed for VOCs in soil. All spike recoveries and RPDs were acceptable. Two of the samples used for MS/MSD analyses were from the CONWR site. The MS recovery of trichloroethene (TCE) from SB32/33-134-N was below the laboratory control limit likely due to matrix interferences. However, the MSD recovery was within control limits. Acceptable LCS results demonstrated that the analytical system was operating within control limits. All other MS/MSD analysis results for VOCs were within QC limits.

All analytical constituents were injected into six MS/MSD samples for dissolved gases, and into four to 11 MS/MSD samples for wet chemistry parameters. Eight laboratory duplicate analyses were performed for TDS. The recoveries and RPDs for methane, ethane, and ethene were acceptable. The recoveries of alkalinity and chloride from sample GW32/33-502 in one MS/MSD analysis were below the control limits. A data validation qualifier (j) was added to the affected sample results because of these exceedences. The recovery of nitrate + nitrite from the same sample was above the control limit. These nitrogen species were not detected in the sample. Therefore, no action was required. Five other nitrate + nitrite spike analyses were performed with samples that were not from the CONWR site. Therefore, the control limit exceedences among those analyses did not affect the CONWR sample data. The recovery of alkalinity from another sample was low. However, the sample was not from the CONWR site,

and did not affect the CONWR sample data. All other spike and duplicate analysis results for the wet chemistry parameters were acceptable. Acceptable laboratory performance was also demonstrated by acceptable LCS data.

3.12 Surrogate/System Monitoring Compound (SMC) Spikes

Surrogate/SMC spikes are compounds similar to the analytes of interest in chemical behavior, but they are not normally found in environmental samples. Laboratory performance of individual samples and blanks was established by spiking all samples and blanks prior to extraction and analysis to determine surrogate/SMC spike recoveries among the samples, blanks, and MSs/MSDs in the sample and blank matrices.

During the on-site analyses of VOCs, ECCS used 1,4-dichlorobutadiene as a surrogate in the GC/ELCD analysis and 4-bromochlorobenzene as a surrogate in the GC/PID analysis. Nonane was used as a surrogate in the GC/FID analysis. When a sample dilution was required due to a high concentration of a target constituent, a surrogate compound was diluted out. The laboratory qualified the surrogate result with "DO" qualifiers. If the surrogate recovery in an undiluted sample was below 60 or above 140 percent, the sample was reanalyzed, except for sample SB-422-P (30-32'), which had high recoveries of the GC/ELCD and GC/PID surrogate. A data validation qualifier (j) was added to the sample results to indicate a potentially high bias for the reported VOC concentrations. All other surrogate recoveries in the final results were acceptable.

During the off-site laboratory analyses, STL, Inc., used bromofluorobenzene (BFB) as the surrogate compound in the VOC analysis of water samples using the CLP method. The VOC surrogates in the soil sample analysis included 4-bromofluorobenzene; dibromofluoromethane; 1,2-dichloroethane-d4; and toluene-d8. All surrogate recoveries were acceptable.

3.13 Laboratory Control Samples

The laboratory control samples (LCSs) were used to monitor the overall performance of all steps in the analysis, including the sample preparation. Sixteen LCS analyses were performed with the analytical batches of water samples for VOCs. Twelve VOCs were used in LCS analysis of water samples. Eight LCS/LCS duplicate analyses were performed for VOCs in soil and one for VOCs in water. Six VOCs were used in the soil LCS analyses.

All analytical constituents were used in two LCS and five LCS/LCS duplicate analyses for dissolved gases, and in five to eight LCS or LCS/LCS duplicate analyses for wet chemistry parameters. The acceptance criteria were met for all LCS and LCS/LCS duplicate analyses.

3.14 Blind Field Duplicate Samples

ECCS, Inc., analyzed thirty-four pairs of blind field duplicates for VOCs in the on-site mobile laboratory. STL, Inc., analyzed five pairs of blind field duplicates for VOCs in soil in the off-site laboratory. STL also analyzed three pairs of blind field duplicates in the groundwater for VOCs, dissolved gases, and inorganic indicator parameters.

Tables 2 though 4 show the comparison of the reported analytes in the duplicate pairs for VOCs and inorganic parameters that were analyzed by STL. Relative percent difference (RPD) values were calculated for only those pairs in which both reported results were above the Reporting Limit. Constituents that were less than the Limit of Detection are not shown. The detections of acetone in all duplicate pairs for soil and the detections of methylene chloride in one duplicate pair for soil and groundwater were qualified as nondetected during data validation on the basis of blank detections, and are not shown.

Heterogeneity of samples and the difficulty in replicating the analytical results from small sample aliquots decrease the precision expressed as an RPD between some duplicates. Field duplicates measure both field and laboratory precision. As expected, the variability is greater than for the laboratory duplicates, which measure only laboratory precision.

The precision of the samples expressed as relative percent differences is good. With the exception of two RPD values for VOCs in soil, all RPDs were below 35 percent. All RPDs for VOCs in water were below 25 percent. Three RPD values calculated for the inorganic parameters in water samples exceeded 35 percent. There are no required criteria for field duplicate analysis comparability. Therefore, no data validation qualifiers were added to the sample data on the basis of these findings.

The comparison of the blind field duplicate results for VOCs analyzed in the on-site laboratory is presented in the attached spreadsheet. Among the 34 duplicate pairs analyzed by ECCS, five RPD values exceeded 35 percent when both VOC results were above reporting limits.

Section 4
References

RMT. 2000a. Field sampling plan for the groundwater remedial action pre-design fieldwork program, PCB Operable Unit – Sites 32/33, Crab Orchard National Wildlife Refuge, Marion, Illinois. Revision 1, August 2000. RMT, Inc.

RMT. 2000b. Pre-design workplan for the groundwater remedial action, Revision 1, Crab Orchard National Wildlife Refuge, PCB Operable Unit, Sites 32/33, Marion, Illinois. (RMT, 2000). Revision 1, August 2000. RMT, Inc.

RMT. 2000c. Quality assurance project plan for the groundwater remedial action pre-design fieldwork program, PCB Operable Unit – Sites 32/33, Crab Orchard National Wildlife Refuge, Marion, Illinois. Revision 1, August 2000. RMT, Inc.

USEPA. 1983. Methods for chemical analysis of water and waste, EPA 600/4-79-020 with subsequent revisions.

USEPA. 1994. USEPA contract laboratory program, national functional guidelines for inorganic data review.

USEPA. 1999. USEPA contract laboratory program, national functional guidelines for organic data review.

Table 1
Index of Laboratory and Data Validation Qualifiers

Laboratory Qualifiers

INORGANIC DATA	
D	Analyte value is from a diluted analysis.
J	Reported value is less than the reporting limit, but greater than zero.
L	Serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.
N	Spiked sample recovery is not within control limits.
U	Analyte was tested for but was not detected; value indicates the detection limit.
ORGANIC DATA	
B	Analyte was present in the method blank, or during the on-site mobile laboratory analysis; baseline interference resulted in a spurious peak that contributed to the sample result.
D	Analyte value is from a diluted analysis.
DO	A surrogate compound was diluted out when a sample dilution was required due to a high concentration of a target constituent.
E	Reported concentration exceeded the calibration range of the instrument. The result is estimated.
F	Indicates that the analysis result is based on GC/FID analysis performed in the on-site mobile laboratory.
J	Reported value is less than the reporting limit, but greater than zero.
N	Indicates presumptive evidence of a tentatively identified compound (TIC). Identification is based on mass spectral library search.
Q	A compound that was reported as a TIC was quantitated against the response factor of a calibration standard.
U	The compound was analyzed for but not detected; the value indicates the detection limit.

Data Validation Qualifiers

b	Analyte was present in the trip blank.
s	Analyte was present in the laboratory holding/storage blank.
u	Analyte was present at less than 10 times the concentration in the associated method (B), trip (b), field (f), and/or laboratory storage blank for common laboratory contaminants, or at less than 5 times the blank concentration of other analytes, and is therefore qualified as nondetectable (u) according to USEPA data validation procedures.
j	When specific QC criteria are outside the established control limits, the reported concentration or the Quantitation Limit is approximate.

Table 2
Detected VOC Parameters for Blind Field Duplicates in Soil
(units µg/kg)

PARAMETER	SB-131 08-10' 09/29/00	SB-131 08-10' DUP 09/29/00	RPD %	SB-202 10-12' 09/18/00	SB-202 10-12' DUP 09/18/00	RPD %	SB-306 44-46' 10/16/00	SB-306 44-46' DUP 10/16/00	RPD %	SB-413 34-36' 09/15/00	SB-413 34-36' DUP 09/15/00	RPD %	SB-423 20-22' 10/02/00	SB-423 20-22' DUP 10/02/00	RPD %
Chlorobenzene	<210	<210	--	750	530	34	<210	<220	--	<470	<470	--	<2,200	<2,100	--
1,2-Dichloroethene, total	180 J	170 J	--	5,000	3,100	47	<210	<220	--	230 J	240 J	--	3,400	2,500	31
4-Methyl-2-pentanone	<840	<840	--	<2,400	<1,200	--	<840	<860	--	<1,900	<1,900	--	1,100 J	1,100 J	--
Tetrachloroethene	<210	<210	--	<600	<300	--	<210	<220	--	660	720	9	480 J	<2,100	--
Toluene	<210	<210	--	<600	<300	--	<210	<220	--	<470	<470	--	430 J	350 J	--
Trichloroethene	2,300	2,000	14	17,000	9,900	53	<210	<220	--	11,000	12,000	9	49,000	40,000	20

Notes:
Analysis results are from GC/MS analyses performed by STL, Inc.
-- = either one or both values are less than the Quantitation Limit; therefore, an RPD calculation is of limited significance and was not done.
J = reported value is less than the reporting limit, but greater than zero.
No other VOCs were detected or were qualified as ND.

Prepared by: KKS
QC review by: PMP

Table 3
Detected VOCs for Blind Field Duplicate Pairs in Groundwater
(units µg/L)

PARAMETER	GW-303 10/17/00	GW-303 DUP 10/17/00	RPD %	33MWC-07 10/31/00	33MWC-07 DUP 10/31/00	RPD %	33MWC-45 10/31/00	33MWC-45 DUP 10/31/00	RPD %
Benzene	<420	<310	--	1,100 J	1,100 J	--	<1	<1	--
Chlorobenzene	<420	<310	--	18,000	19,000	5	<1	<1	--
Chloroform	<420	<310	--	<3,100	<5,000	--	0.28 J	0.40 J	--
cis-1,2-Dichloroethene	5,700	5,600	2	9,800	10,000	2	<1	<1	--
Ethane	23	21	9	1.4	1.4	0	<0.5	<0.5	--
Ethene	20	25	22	1.5	1.4	7	<0.5	<0.5	--
Methane	1,200 D	1,400 D	15	28	27	4	390 D	310 D	23
Tetrachloroethene	2,000	2,000	0	<3,100	<5,000	--	<1	<1	--
Trichloroethene	510	530	4	52,000	57,000	9	<1	0.19 J	--
Vinyl chloride	2,100	2,100	0	<3,100	<5,000	--	<1	<1	--

Notes:
Analysis results are from GC/MS analyses performed by STL, Inc.
-- = either one or both values are less than the Quantitation Limit; therefore, an RPD calculation is of limited significance and was not done.
D = analyte value is from a diluted analysis.
D = reported value is less than the reporting limit, but greater than zero.
No other VOCs were detected or were qualified as ND.

Prepared by: KKS
QC review by: PMP

Table 4
Detected Indicator Parameters for Blind Field Duplicate Pairs in Groundwater
(units mg/L)

PARAMETER	GW-303 10/17/00	GW-303 DUP 10/17/00	RPD %	33MWC-07 10/31/00	33MWC-07 DUP 10/31/00	RPD %	33MWC-45 10/31/00	33MWC-45 DUP 10/31/00	RPD %
Alkalinity as $CaCO_3$	290	520	57	480	470	2	480	470	2
Ammonia nitrogen	<0.2	<0.2	--	<0.2	<0.2	--	1.2	1.3	8
Chloride	25.4	26.0	2	54.2	53.8	1	202	198	2
Nitrate + nitrite	<0.1	<0.1	--	0.1	0.1	0	<0.1	<0.1	--
Sulfate	26.0	26.4	2	481	492	2	22.7	22.6	0.4
Total dissolved solids	370	590	46	1,200	1,200	0	790	780	1
Total organic carbon	2	3	40	4	4	0	3	3	0

Notes:
Analyses were performed by STL, Inc.
-- = both values are less than the Quantitation Limit; therefore, an RPD calculation is of limited significance and was not done.
No other inorganic parameters listed were detected.

Prepared by: KKS
QC review by: PMP

Crab Orchard - Pre Design Fieldwork. On-Site Soil Borings.

LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-007	SB-100 10'-12'	9/12/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	TETRACHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	TRICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-007	SB-100 10'-12'	9/12/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-011	SB-102 10'-12'	9/12/2000	1,1,1-TRICHLOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	SB-102 10'-12'	9/12/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	SB-102 10'-12'	9/12/2000	1,1-DICHLOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	SB-102 10'-12'	9/12/2000	1,1-DICHLOROETHENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	SB-102 10'-12'	9/12/2000	1,2-DICHLOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	SB-102 10'-12'	9/12/2000	BENZENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	**SB-102 10'-12'**	**9/12/2000**	**CIS-1,2-DICHLOROETHENE**	**310 UG/KG**	**360 UG/KG**	**14.93**
ECCS-011	SB-102 10'-12'	9/12/2000	ETHYLBENZENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	SB-102 10'-12'	9/12/2000	TETRACHLOROETHENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	SB-102 10'-12'	9/12/2000	TOLUENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	SB-102 10'-12'	9/12/2000	TRANS-1,2-DICHLOROETHENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	**SB-102 10'-12'**	**9/12/2000**	**TRICHLOROETHENE**	**11000 UG/KG F**	**11000 UG/KG F**	**0.00**
ECCS-011	SB-102 10'-12'	9/12/2000	VINYL CHLORIDE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-011	SB-102 10'-12'	9/12/2000	XYLENE, M + P	< 250 UG/KG	< 250 UG/KG	0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-026	SB-110 16'-18'	9/13/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	TETRACHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	TRICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-026	SB-110 16'-18'	9/13/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-046	SB-120 16'-18'	9/14/2000	1,1,1-TRICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-046	SB-120 16'-18'	9/14/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-046	SB-120 16'-18'	9/14/2000	1,1-DICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-046	SB-120 16'-18'	9/14/2000	1,1-DICHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-046	SB-120 16'-18'	9/14/2000	1,2-DICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-046	SB-120 16'-18'	9/14/2000	BENZENE	< 50 UG/KG	< 500 UG/KG	163.64
ECCS-046	**SB-120 16'-18'**	**9/14/2000**	**CIS-1,2-DICHLOROETHENE**	**1100 UG/KG**	**1500 UG/KG**	**30.77**
ECCS-046	SB-120 16'-18'	9/14/2000	ETHYLBENZENE	< 50 UG/KG	< 500 UG/KG	163.64
ECCS-046	SB-120 16'-18'	9/14/2000	TETRACHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-046	SB-120 16'-18'	9/14/2000	TOLUENE	< 50 UG/KG	< 500 UG/KG	163.64
ECCS-046	SB-120 16'-18'	9/14/2000	TRANS-1,2-DICHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-046	**SB-120 16'-18'**	**9/14/2000**	**TRICHLOROETHENE**	**5000 UG/KG**	**6100 UG/KG**	**19.82**
ECCS-046	SB-120 16'-18'	9/14/2000	VINYL CHLORIDE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-046	SB-120 16'-18'	9/14/2000	XYLENE, M + P	< 50 UG/KG	< 500 UG/KG	163.64

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-071	SB-121 34'-36'	9/15/2000	1,1,1-TRICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	1,1-DICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	1,1-DICHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	1,2-DICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	BENZENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	CIS-1,2-DICHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	ETHYLBENZENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	TETRACHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	TOLUENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	TRANS-1,2-DICHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	**SB-121 34'-36'**	**9/15/2000**	**TRICHLOROETHENE**	**4100 UG/KG**	**4100 UG/KG**	**0.00**
ECCS-071	SB-121 34'-36'	9/15/2000	VINYL CHLORIDE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-071	SB-121 34'-36'	9/15/2000	XYLENE, M + P	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-255	SB-123 08'-10'	9/30/2000	1,1,1-TRICHLOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-255	SB-123 08'-10'	9/30/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-255	SB-123 08'-10'	9/30/2000	1,1-DICHLOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-255	SB-123 08'-10'	9/30/2000	1,1-DICHLOROETHENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-255	SB-123 08'-10'	9/30/2000	1,2-DICHLOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-255	SB-123 08'-10'	9/30/2000	BENZENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-255	**SB-123 08'-10'**	**9/30/2000**	**CIS-1,2-DICHLOROETHENE**	**1500 UG/KG**	**1200 UG/KG**	**22.22**
ECCS-255	SB-123 08'-10'	9/30/2000	ETHYLBENZENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-255	SB-123 08'-10'	9/30/2000	TETRACHLOROETHENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-255	SB-123 08'-10'	9/30/2000	TOLUENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-255	SB-123 08'-10'	9/30/2000	TRANS-1,2-DICHLOROETHENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-255	**SB-123 08'-10'**	**9/30/2000**	**TRICHLOROETHENE**	**5400 UG/KG**	**4400 UG/KG**	**20.41**
ECCS-255	SB-123 08'-10'	9/30/2000	VINYL CHLORIDE	250 UG/KG JBu	250 UG/KG JBu	0.00
ECCS-255	SB-123 08'-10'	9/30/2000	XYLENE, M + P	< 250 UG/KG	< 250 UG/KG	0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT		DUP RESULT		%RPD
ECCS-257	SB-123 18'-20'	9/30/2000	1,1,1-TRICHLOROETHANE	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-257	SB-123 18'-20'	9/30/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-257	SB-123 18'-20'	9/30/2000	1,1-DICHLOROETHANE	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-257	SB-123 18'-20'	9/30/2000	1,1-DICHLOROETHENE	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-257	SB-123 18'-20'	9/30/2000	1,2-DICHLOROETHANE	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-257	SB-123 18'-20'	9/30/2000	BENZENE	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-257	**SB-123 18'-20'**	**9/30/2000**	**CIS-1,2-DICHLOROETHENE**	**850 UG/KG**		**940 UG/KG**		**10.06**
ECCS-257	SB-123 18'-20'	9/30/2000	ETHYLBENZENE	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-257	SB-123 18'-20'	9/30/2000	TETRACHLOROETHENE	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-257	SB-123 18'-20'	9/30/2000	TOLUENE	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-257	SB-123 18'-20'	9/30/2000	TRANS-1,2-DICHLOROETHENE	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-257	**SB-123 18'-20'**	**9/30/2000**	**TRICHLOROETHENE**	**6900 UG/KG**		**6800 UG/KG**		**1.46**
ECCS-257	SB-123 18'-20'	9/30/2000	VINYL CHLORIDE	250 UG/KG	JBu	250 UG/KG	JBu	0.00
ECCS-257	SB-123 18'-20'	9/30/2000	XYLENE, M + P	< 250 UG/KG		< 250 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	1,1-DICHLOROETHANE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	1,1-DICHLOROETHENE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	1,2-DICHLOROETHANE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	BENZENE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	ETHYLBENZENE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	TETRACHLOROETHENE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	TOLUENE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	**SB-125 36'-38'**	**9/30/2000**	**TRICHLOROETHENE**	**35 UG/KG**	**J**	**95 UG/KG**		**92.31**
ECCS-264	SB-125 36'-38'	9/30/2000	VINYL CHLORIDE	< 50 UG/KG		< 50 UG/KG		0.00
ECCS-264	SB-125 36'-38'	9/30/2000	XYLENE, M + P	< 50 UG/KG		< 50 UG/KG		0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-226	SB-126 40'-42'	9/27/2000	1,1,1-TRICHLOROETHANE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	1,1-DICHLOROETHANE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	1,1-DICHLOROETHENE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	1,2-DICHLOROETHANE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	BENZENE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	CIS-1,2-DICHLOROETHENE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	ETHYLBENZENE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	TETRACHLOROETHENE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	TOLUENE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	TRANS-1,2-DICHLOROETHENE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	**SB-126 40'-42'**	**9/27/2000**	**TRICHLOROETHENE**	**150000 UG/KG**	**350000 UG/KG**	**80.00**
ECCS-226	SB-126 40'-42'	9/27/2000	VINYL CHLORIDE	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-226	SB-126 40'-42'	9/27/2000	XYLENE, M + P	< 5000 UG/KG	< 25000 UG/KG	133.33
ECCS-220	SB-127 14'-16'	9/27/2000	1,1,1-TRICHLOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-220	SB-127 14'-16'	9/27/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-220	SB-127 14'-16'	9/27/2000	1,1-DICHLOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-220	SB-127 14'-16'	9/27/2000	1,1-DICHLOROETHENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-220	SB-127 14'-16'	9/27/2000	1,2-DICHLOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-220	SB-127 14'-16'	9/27/2000	BENZENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-220	**SB-127 14'-16'**	**9/27/2000**	**CIS-1,2-DICHLOROETHENE**	**5900 UG/KG**	**5500 UG/KG**	**7.02**
ECCS-220	SB-127 14'-16'	9/27/2000	ETHYLBENZENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-220	SB-127 14'-16'	9/27/2000	TETRACHLOROETHENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-220	SB-127 14'-16'	9/27/2000	TOLUENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-220	SB-127 14'-16'	9/27/2000	TRANS-1,2-DICHLOROETHENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-220	**SB-127 14'-16'**	**9/27/2000**	**TRICHLOROETHENE**	**26000 UG/KG**	**24000 UG/KG**	**8.00**
ECCS-220	**SB-127 14'-16'**	**9/27/2000**	**VINYL CHLORIDE**	**590 UG/KG J**	**UG/KG Jj**	**100.00**
ECCS-220	SB-127 14'-16'	9/27/2000	XYLENE, M + P	< 1000 UG/KG	< 1000 UG/KG	0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-246	SB-131 06'-08'	9/29/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-246	SB-131 06'-08'	9/29/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-246	SB-131 06'-08'	9/29/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-246	SB-131 06'-08'	9/29/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-246	SB-131 06'-08'	9/29/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-246	SB-131 06'-08'	9/29/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-246	**SB-131 06'-08'**	**9/29/2000**	**CIS-1,2-DICHLOROETHENE**	**95 UG/KG**	**86 UG/KG**	**9.94**
ECCS-246	SB-131 06'-08'	9/29/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-246	SB-131 06'-08'	9/29/2000	TETRACHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-246	SB-131 06'-08'	9/29/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-246	SB-131 06'-08'	9/29/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-246	**SB-131 06'-08'**	**9/29/2000**	**TRICHLOROETHENE**	**1200 UG/KG**	**1100 UG/KG**	**8.70**
ECCS-246	SB-131 06'-08'	9/29/2000	VINYL CHLORIDE	< 50 UG/KG	50 UG/KG JBu	0.00
ECCS-246	SB-131 06'-08'	9/29/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-343	SB-133 26'-28'	10/3/2000	1,1,1-TRICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	SB-133 26'-28'	10/3/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	SB-133 26'-28'	10/3/2000	1,1-DICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	SB-133 26'-28'	10/3/2000	1,1-DICHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	SB-133 26'-28'	10/3/2000	1,2-DICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	SB-133 26'-28'	10/3/2000	BENZENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	**SB-133 26'-28'**	**10/3/2000**	**CIS-1,2-DICHLOROETHENE**	**1800 UG/KG**	**1800 UG/KG**	**0.00**
ECCS-343	SB-133 26'-28'	10/3/2000	ETHYLBENZENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	SB-133 26'-28'	10/3/2000	TETRACHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	SB-133 26'-28'	10/3/2000	TOLUENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	SB-133 26'-28'	10/3/2000	TRANS-1,2-DICHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	**SB-133 26'-28'**	**10/3/2000**	**TRICHLOROETHENE**	**10000 UG/KG**	**10000 UG/KG**	**0.00**
ECCS-343	SB-133 26'-28'	10/3/2000	VINYL CHLORIDE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-343	SB-133 26'-28'	10/3/2000	XYLENE, M + P	< 500 UG/KG	< 500 UG/KG	0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-140	SB-202 18'-20'	9/18/2000	1,1,1-TRICHLOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-140	SB-202 18'-20'	9/18/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-140	SB-202 18'-20'	9/18/2000	1,1-DICHLOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-140	SB-202 18'-20'	9/18/2000	1,1-DICHLOROETHENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-140	SB-202 18'-20'	9/18/2000	1,2-DICHLOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-140	SB-202 18'-20'	9/18/2000	BENZENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-140	**SB-202 18'-20'**	**9/18/2000**	**CIS-1,2-DICHLOROETHENE**	**3000 UG/KG**	**2000 UG/KG**	**40.00**
ECCS-140	**SB-202 18'-20'**	**9/18/2000**	**ETHYLBENZENE**	**810 UG/KG J**	**510 UG/KG J**	**45.45**
ECCS-140	**SB-202 18'-20'**	**9/18/2000**	**TETRACHLOROETHENE**	**410 UG/KG JB**	**< 1000 UG/KG**	**83.69**
ECCS-140	SB-202 18'-20'	9/18/2000	TOLUENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-140	SB-202 18'-20'	9/18/2000	TRANS-1,2-DICHLOROETHENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-140	**SB-202 18'-20'**	**9/18/2000**	**TRICHLOROETHENE**	**11000 UG/KG**	**6100 UG/KG**	**57.31**
ECCS-140	SB-202 18'-20'	9/18/2000	VINYL CHLORIDE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-140	SB-202 18'-20'	9/18/2000	XYLENE, M + P	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-159	SB-208 10'-12'	9/19/2000	1,1,1-TRICHLOROETHANE	< 500 UG/KG	< 250 UG/KG	66.67
ECCS-159	SB-208 10'-12'	9/19/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 500 UG/KG	< 250 UG/KG	66.67
ECCS-159	SB-208 10'-12'	9/19/2000	1,1-DICHLOROETHANE	< 500 UG/KG	< 250 UG/KG	66.67
ECCS-159	SB-208 10'-12'	9/19/2000	1,1-DICHLOROETHENE	< 500 UG/KG	< 250 UG/KG	66.67
ECCS-159	SB-208 10'-12'	9/19/2000	1,2-DICHLOROETHANE	< 500 UG/KG	< 250 UG/KG	66.67
ECCS-159	SB-208 10'-12'	9/19/2000	BENZENE	< 500 UG/KG	< 250 UG/KG	66.67
ECCS-159	SB-208 10'-12'	9/19/2000	CIS-1,2-DICHLOROETHENE	< 500 UG/KG	< 250 UG/KG	66.67
ECCS-159	SB-208 10'-12'	9/19/2000	ETHYLBENZENE	< 500 UG/KG	< 250 UG/KG	66.67
ECCS-159	SB-208 10'-12'	9/19/2000	TETRACHLOROETHENE	500 UG/KG JBu	110 UG/KG J	127.87
ECCS-159	SB-208 10'-12'	9/19/2000	TOLUENE	< 500 UG/KG	< 250 UG/KG	66.67
ECCS-159	SB-208 10'-12'	9/19/2000	TRANS-1,2-DICHLOROETHENE	< 500 UG/KG	< 250 UG/KG	66.67
ECCS-159	**SB-208 10'-12'**	**9/19/2000**	**TRICHLOROETHENE**	**6100 UG/KG**	**2300 UG/KG**	**90.48**
ECCS-159	**SB-208 10'-12'**	**9/19/2000**	**VINYL CHLORIDE**	**31 UG/KG J**	**< 250 UG/KG**	**155.87**
ECCS-159	SB-208 10'-12'	9/19/2000	XYLENE, M + P	< 500 UG/KG	< 250 UG/KG	66.67

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-322	SB-210 36'-38'	10/2/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	TETRACHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	TRICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-322	SB-210 36'-38'	10/2/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	SB-211 18'-20'	9/20/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	SB-211 18'-20'	9/20/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	SB-211 18'-20'	9/20/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	SB-211 18'-20'	9/20/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	SB-211 18'-20'	9/20/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	SB-211 18'-20'	9/20/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	SB-211 18'-20'	9/20/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	SB-211 18'-20'	9/20/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	**SB-211 18'-20'**	**9/20/2000**	**TETRACHLOROETHENE**	**22 UG/KG J**	**< 50 UG/KG**	**77.78**
ECCS-189	SB-211 18'-20'	9/20/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	SB-211 18'-20'	9/20/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	**SB-211 18'-20'**	**9/20/2000**	**TRICHLOROETHENE**	**310 UG/KG**	**290 UG/KG**	**6.67**
ECCS-189	SB-211 18'-20'	9/20/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-189	SB-211 18'-20'	9/20/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-175	SB-212 10'-12'	9/20/2000	1,1,1-TRICHLOROETHANE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	SB-212 10'-12'	9/20/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	SB-212 10'-12'	9/20/2000	1,1-DICHLOROETHANE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	SB-212 10'-12'	9/20/2000	1,1-DICHLOROETHENE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	SB-212 10'-12'	9/20/2000	1,2-DICHLOROETHANE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	SB-212 10'-12'	9/20/2000	BENZENE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	SB-212 10'-12'	9/20/2000	CIS-1,2-DICHLOROETHENE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	SB-212 10'-12'	9/20/2000	ETHYLBENZENE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	**SB-212 10'-12'**	**9/20/2000**	**TETRACHLOROETHENE**	**3600 UG/KG F**	**1700 UG/KG F**	**71.70**
ECCS-175	SB-212 10'-12'	9/20/2000	TOLUENE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	SB-212 10'-12'	9/20/2000	TRANS-1,2-DICHLOROETHENE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	**SB-212 10'-12'**	**9/20/2000**	**TRICHLOROETHENE**	**44000 UG/KG F**	**22000 UG/KG F**	**66.67**
ECCS-175	SB-212 10'-12'	9/20/2000	VINYL CHLORIDE	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-175	SB-212 10'-12'	9/20/2000	XYLENE, M + P	< 5000 UG/KG	< 2500 UG/KG	66.67
ECCS-201	SB-214 08'-10'	9/26/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	TETRACHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	**SB-214 08'-10'**	**9/26/2000**	**TRICHLOROETHENE**	**23 UG/KG J**	**22 UG/KG J**	**4.44**
ECCS-201	SB-214 08'-10'	9/26/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-201	SB-214 08'-10'	9/26/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-205	SB-216 08'-10'	9/26/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	TETRACHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	TRICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-205	SB-216 08'-10'	9/26/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	TETRACHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	**SB-218 20'-22'**	**10/4/2000**	**TRICHLOROETHENE**	**200 UG/KG**	**150 UG/KG**	**28.57**
ECCS-351	SB-218 20'-22'	10/4/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-351	SB-218 20'-22'	10/4/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-113	SB-411 36'-38'	9/17/2000	1,1,1-TRICHLOROETHANE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	SB-411 36'-38'	9/17/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	SB-411 36'-38'	9/17/2000	1,1-DICHLOROETHANE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	SB-411 36'-38'	9/17/2000	1,1-DICHLOROETHENE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	SB-411 36'-38'	9/17/2000	1,2-DICHLOROETHANE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	SB-411 36'-38'	9/17/2000	BENZENE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	SB-411 36'-38'	9/17/2000	CIS-1,2-DICHLOROETHENE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	SB-411 36'-38'	9/17/2000	ETHYLBENZENE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	**SB-411 36'-38'**	**9/17/2000**	**TETRACHLOROETHENE**	**2600 UG/KG JB**	**2600 UG/KG JB**	**0.00**
ECCS-113	SB-411 36'-38'	9/17/2000	TOLUENE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	SB-411 36'-38'	9/17/2000	TRANS-1,2-DICHLOROETHENE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	**SB-411 36'-38'**	**9/17/2000**	**TRICHLOROETHENE**	**100000 UG/KG**	**120000 UG/KG E**	**18.18**
ECCS-113	SB-411 36'-38'	9/17/2000	VINYL CHLORIDE	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-113	SB-411 36'-38'	9/17/2000	XYLENE, M + P	< 5000 UG/KG	< 5000 UG/KG	0.00
ECCS-060	SB-413 34'-36'	9/15/2000	1,1,1-TRICHLOROETHANE	< 1000 UG/KG	< 500 UG/KG	66.67
ECCS-060	SB-413 34'-36'	9/15/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 1000 UG/KG	< 500 UG/KG	66.67
ECCS-060	SB-413 34'-36'	9/15/2000	1,1-DICHLOROETHANE	< 1000 UG/KG	< 500 UG/KG	66.67
ECCS-060	SB-413 34'-36'	9/15/2000	1,1-DICHLOROETHENE	< 1000 UG/KG	< 500 UG/KG	66.67
ECCS-060	SB-413 34'-36'	9/15/2000	1,2-DICHLOROETHANE	< 1000 UG/KG	< 500 UG/KG	66.67
ECCS-060	SB-413 34'-36'	9/15/2000	BENZENE	< 1000 UG/KG	< 500 UG/KG	66.67
ECCS-060	SB-413 34'-36'	9/15/2000	CIS-1,2-DICHLOROETHENE	< 1000 UG/KG	190 UG/KG J	136.13
ECCS-060	SB-413 34'-36'	9/15/2000	ETHYLBENZENE	< 1000 UG/KG	< 500 UG/KG	66.67
ECCS-060	**SB-413 34'-36'**	**9/15/2000**	**TETRACHLOROETHENE**	**760 UG/KG J**	**590 UG/KG**	**25.19**
ECCS-060	SB-413 34'-36'	9/15/2000	TOLUENE	< 1000 UG/KG	< 500 UG/KG	66.67
ECCS-060	SB-413 34'-36'	9/15/2000	TRANS-1,2-DICHLOROETHENE	< 1000 UG/KG	< 500 UG/KG	66.67
ECCS-060	**SB-413 34'-36'**	**9/15/2000**	**TRICHLOROETHENE**	**9300 UG/KG**	**9200 UG/KG**	**1.08**
ECCS-060	SB-413 34'-36'	9/15/2000	VINYL CHLORIDE	< 1000 UG/KG	< 500 UG/KG	66.67
ECCS-060	SB-413 34'-36'	9/15/2000	XYLENE, M + P	< 1000 UG/KG	< 500 UG/KG	66.67

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-091	SB-415 36'-38'	9/16/2000	1,1,1-TRICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	SB-415 36'-38'	9/16/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	SB-415 36'-38'	9/16/2000	1,1-DICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	SB-415 36'-38'	9/16/2000	1,1-DICHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	SB-415 36'-38'	9/16/2000	1,2-DICHLOROETHANE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	SB-415 36'-38'	9/16/2000	BENZENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	SB-415 36'-38'	9/16/2000	CIS-1,2-DICHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	SB-415 36'-38'	9/16/2000	ETHYLBENZENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	**SB-415 36'-38'**	**9/16/2000**	**TETRACHLOROETHENE**	**2000 UG/KG**	**2100 UG/KG**	**4.88**
ECCS-091	SB-415 36'-38'	9/16/2000	TOLUENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	SB-415 36'-38'	9/16/2000	TRANS-1,2-DICHLOROETHENE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	**SB-415 36'-38'**	**9/16/2000**	**TRICHLOROETHENE**	**23000 UG/KG F**	**28000 UG/KG F**	**19.61**
ECCS-091	SB-415 36'-38'	9/16/2000	VINYL CHLORIDE	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-091	SB-415 36'-38'	9/16/2000	XYLENE, M + P	< 500 UG/KG	< 500 UG/KG	0.00
ECCS-082	SB-416 38'-40'	9/16/2000	1,1,1-TRICHLOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	SB-416 38'-40'	9/16/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	SB-416 38'-40'	9/16/2000	1,1-DICHLOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	SB-416 38'-40'	9/16/2000	1,1-DICHLOROETHENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	SB-416 38'-40'	9/16/2000	1,2-DICHLOROETHANE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	SB-416 38'-40'	9/16/2000	BENZENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	SB-416 38'-40'	9/16/2000	CIS-1,2-DICHLOROETHENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	SB-416 38'-40'	9/16/2000	ETHYLBENZENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	**SB-416 38'-40'**	**9/16/2000**	**TETRACHLOROETHENE**	**510 UG/KG J**	**510 UG/KG J**	**0.00**
ECCS-082	SB-416 38'-40'	9/16/2000	TOLUENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	SB-416 38'-40'	9/16/2000	TRANS-1,2-DICHLOROETHENE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	**SB-416 38'-40'**	**9/16/2000**	**TRICHLOROETHENE**	**14000 UG/KG**	**13000 UG/KG**	**7.41**
ECCS-082	SB-416 38'-40'	9/16/2000	VINYL CHLORIDE	< 1000 UG/KG	< 1000 UG/KG	0.00
ECCS-082	SB-416 38'-40'	9/16/2000	XYLENE, M + P	< 1000 UG/KG	< 1000 UG/KG	0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-337	SB-421 20'-22'	10/3/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	TETRACHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	**SB-421 20'-22'**	**10/3/2000**	**TRICHLOROETHENE**	**54 UG/KG**	**72 UG/KG**	**28.57**
ECCS-337	SB-421 20'-22'	10/3/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-337	SB-421 20'-22'	10/3/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-346	SB-422 30'-32'	10/4/2000	1,1,1-TRICHLOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	SB-422 30'-32'	10/4/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	SB-422 30'-32'	10/4/2000	1,1-DICHLOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	SB-422 30'-32'	10/4/2000	1,1-DICHLOROETHENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	SB-422 30'-32'	10/4/2000	1,2-DICHLOROETHANE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	SB-422 30'-32'	10/4/2000	BENZENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	**SB-422 30'-32'**	**10/4/2000**	**CIS-1,2-DICHLOROETHENE**	**240 UG/KG Jj**	**240 UG/KG J**	**0.00**
ECCS-346	SB-422 30'-32'	10/4/2000	ETHYLBENZENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	SB-422 30'-32'	10/4/2000	TETRACHLOROETHENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	SB-422 30'-32'	10/4/2000	TOLUENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	SB-422 30'-32'	10/4/2000	TRANS-1,2-DICHLOROETHENE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	**SB-422 30'-32'**	**10/4/2000**	**TRICHLOROETHENE**	**3500 UG/KG Jj**	**3700 UG/KG**	**5.56**
ECCS-346	SB-422 30'-32'	10/4/2000	VINYL CHLORIDE	< 250 UG/KG	< 250 UG/KG	0.00
ECCS-346	SB-422 30'-32'	10/4/2000	XYLENE, M + P	< 250 UG/KG	< 250 UG/KG	0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-312	SB-423 20'-22'	10/2/2000	1,1,1-TRICHLOROETHANE	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-312	SB-423 20'-22'	10/2/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-312	SB-423 20'-22'	10/2/2000	1,1-DICHLOROETHANE	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-312	SB-423 20'-22'	10/2/2000	1,1-DICHLOROETHENE	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-312	SB-423 20'-22'	10/2/2000	1,2-DICHLOROETHANE	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-312	SB-423 20'-22'	10/2/2000	BENZENE	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-312	**SB-423 20'-22'**	**10/2/2000**	**CIS-1,2-DICHLOROETHENE**	**4800 UG/KG**	**5000 UG/KG**	**4.08**
ECCS-312	SB-423 20'-22'	10/2/2000	ETHYLBENZENE	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-312	**SB-423 20'-22'**	**10/2/2000**	**TETRACHLOROETHENE**	**1000 UG/KG J**	**< 5000 UG/KG**	**133.33**
ECCS-312	SB-423 20'-22'	10/2/2000	TOLUENE	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-312	SB-423 20'-22'	10/2/2000	TRANS-1,2-DICHLOROETHENE	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-312	**SB-423 20'-22'**	**10/2/2000**	**TRICHLOROETHENE**	**52000 UG/KG**	**50000 UG/KG**	**3.92**
ECCS-312	SB-423 20'-22'	10/2/2000	VINYL CHLORIDE	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-312	SB-423 20'-22'	10/2/2000	XYLENE, M + P	< 2500 UG/KG	< 5000 UG/KG	66.67
ECCS-305	SB-500 28'-30'	10/1/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	TETRACHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	TRICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-305	SB-500 28'-30'	10/1/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00

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LABNUM	SAMPLEID	DATE	PARMNAME	SAMPLE RESULT	DUP RESULT	%RPD
ECCS-184	SB-503 06'-08'	9/20/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	TETRACHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	TRICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-184	SB-503 06'-08'	9/20/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	1,1,1-TRICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	1,1,2-TRICHLOROTRIFLUOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	1,1-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	1,1-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	1,2-DICHLOROETHANE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	BENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	CIS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	ETHYLBENZENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	**SB-504 02'-04'**	**9/20/2000**	**TETRACHLOROETHENE**	**100 UG/KG**	**34 UG/KG J**	**98.51**
ECCS-179	SB-504 02'-04'	9/20/2000	TOLUENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	TRANS-1,2-DICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	TRICHLOROETHENE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	VINYL CHLORIDE	< 50 UG/KG	< 50 UG/KG	0.00
ECCS-179	SB-504 02'-04'	9/20/2000	XYLENE, M + P	< 50 UG/KG	< 50 UG/KG	0.00

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