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Appendices

for the . . .

PHASE II REMEDIAL INVESTIGATION

of the . . .

Skinner Landfill Site

West Chester, Ohio

U.S.E.P.A. Region V Chicago, Illinois

EPA Contract No.
68-W8-0079
EPA Work Assignment
No. 04-5L73

04003
May, 1991

APPENDICES

for the...

PHASE II REMEDIAL INVESTIGATION

of the . . .

Skinner Landfill Site
West Chester, Ohio

prepared for . . .

U.S. Environmental Protection Agency
Region V
Chicago, Illinois

EPA Contract No. 68-W8-0079
EPA Work Assignment No. 04-5L73
WW Engineering & Science Project No. 04003

May,1991

WW Engineering & Science

APPENDICES

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Skinner Landfill Site
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EPA Work Assignment No. 04-5L73
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May,1991

WW Engineering & Science

Skinner Landfill RI Appendices

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Well and Boring Logs

Pre-Phase I Wells

THE H. C. NUTTING COMPANY
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TEST BORING REPORT

CLIENT: Albert Skinner — ORDER No. 2150.4

PROJECT: Skinner Landfill, West Chester, Ohio — HOLE No. 1

LOCATION: As shown on plan

DRILLER: J. Mitchell — DRILL No. 33 — DATE STARTED: 7-29-75

ELEVATION REFERENCE: — DATE COMPLETED: 7-29-75

CASING: DIAMETER: 3.25" I.D. Hollow Stem Auger — HAMMER WT.: — FALL:

SAMPLER: DIAMETER & TYPE: 2.0" O.D. Split Spoon — HAMMER WT.: 140# — FALL: 30"

DEPTH TO WATER: IMMEDIATE: None — UPON COMPLETION: None

DEPTH TO WATER: — DAYS AFTER COMPLETION: Backfilled — WATER USED IN DRILLING: No

ELEVATION	DEPTH		DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER (BP 70 USED ONL)	Recove
	0'	2.0'	Brown and gray silty clay with a trace of organics, moist - stiff to very stiff	1	0-1.5	SS	3-4-6	18"
	2.0'	6.0'	Brown sandy silty clay and fine to coarse gravel, (limestone pebbles), moist - very stiff	2 3 4	2.5-4 5-6.5 7.5-9	SS SS SS	3-5-9 12-17-19 12-18-16	16" 9" 6"
	8.0'	2.0'	Brown clayey fine to medium sand and fine to coarse gravel, (limestone pebbles), moist - dense					
	10.0'	2.9'	Brown sandy silt with fine to coarse gravel, (limestone pebbles) and clay seams, moist - medium dense	5 6	10-11.5 12.5-13	SS SS	21-9-8 23	12" 4"
	12.9'							

Respectfully submitted,
THE H. C. NUTTING CO.

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of said samples.

PROJECT Skinner Landfill, West Chester, Ohio HOLE No. 1

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 3" ON SAMPLER	Rec.
	12.9'						
		3.6' Brown fine to coarse sand and gravel, moist - very dense	7	13-14	SS	50-39	10
			8	15-16.5	SS	16-25-26	13
	16.5'						
		BORING COMPLETED					

THE H. C. NUTTING COMPANY
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SINCE 192
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TEST BORING REPORT

8/18/76-dn

CLIENT Albert Skinner — ORDER No. 2150.4

PROJECT Skinner Landfill, West Chester, Ohio — HOLE No. 2

LOCATION As shown on plan

DRILLER B. Ford — DRILL No. 32 — DATE STARTED 7-29-76

ELEVATION REFERENCE — DATE COMPLETED 7-29-76

CASING DIAMETER 2.25" I.D. Hollow Stem Auger — HAMMER WT. — FALL

SAMPLER DIAMETER & TYPE 2.0" O.D. Split Spoon — HAMMER WT. 140# — FALL 30"

DEPTH TO WATER IMMEDIATE None — UPON COMPLETION None

DEPTH TO WATER — DAYS AFTER COMPLETION Backfilled Upon — WATER USED IN DRILLING No

ELEVATION	DEPTH 0'	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER (or To Core Rec.)	Recovery
	2.5'	2.5' Brown sandy silty clay with fine gravel and limestone fragments, (fill), moist - soft	1	0-1.5	SS	1-3-3	6"
	5.0'	2.5' Brown and black silty clay with organics, (topsoil and fill), moist - soft	2	2.5-4	SS	3-3-4	13"
	7.5'	2.5' Brown and gray silty clay, (fill), moist - stiff	3	5-6.5	SS	4-5-5	18"
	12.5'	5.0' Brown and gray silty clay with fine to coarse sand and gravel, (odor detected, possible fill), moist - stiff	4 5	7.5-9 10-11.5	SS SS	8-14-15 6-6-6	18" 18"

REMARKS:

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials penetrated in the boring.

Respectfully submitted,
THE H. C. NUTTING CO.

PROJECT Skinner Landfill, West Chester, Ohio HOLE No. 2

ELEVATION	DEPTH 12.5'	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER (2" I.D. 140# HAM.)	Recov.
		2.5' Brown sandy silty clay with fine gravel, (odor detected, possible fill), moist - stiff	6	12.5-14	SS	6-8-10	18
	15.0'	1.5' Brown silty fine to medium sand with silt seams and coarse sand, moist - medium dense	7	15-16.5	SS	7-8-13	18"
	16.5'	BORING COMPLETED					

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TEST BORING REPORT

8/18/76-dn

CLIENT Albert Skinner ORDER No. 2150.4

PROJECT Skinner Landfill, West Chester, Ohio HOLE No. 3

LOCATION As shown on plan

DRILLER J. Mitchell DRILL No. 33 DATE STARTED 7-29-76

ELEVATION REFERENCE DATE COMPLETED 7-29-76

CASING: DIAMETER 3.25" I.D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE 2.0" O.D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE Wet seam @ 13.5' UPON COMPLETION None

DEPTH TO WATER DAYS AFTER COMPLETION Backfilled Upon WATER USED IN DRILLING No

ELEVATION	DEPTH 0'		DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER	Rec
		5.0'	Brown clayey fine to coarse sand, gravel and limestone fragments, moist - medium dense to dense	1 2	0-1.5 2.5-4	SS SS	14-13-11 29-19-21	
	5.0'	2.0'	Brown clayey fine to coarse sand, gravel and limestone fragments, moist - very dense	3	5-6.5	SS	25-40-26	
	7.0'	3.0'	Brown fine to coarse sand and gravel, moist - dense	4	7.5-9	SS	15-16-20	
	10.0'	1.0'	Brown and gray clayey fine to coarse sand and limestone fragments, moist - dense	5	10-11.5	SS	10-15-22	
	11.0'							

REMARKS:

Respectfully submitted,
THE H. C. NUTTING CO.

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other special characteristics.

PROJECT Skinner Landfill, West Chester, Ohio HOLE No. 3

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER	Rem
	11.0'						
		1.5' Gray till with gravel, moist - stiff, (driller's break, not enough sample to check).					
	12.5'						
		1.0' Brown sandy silt and fine to coarse gravel with limestone fragments, moist - medium dense	6	12.5-13.5	SS	7-8	
	13.5'						
		0.5' Brown clayey fine sand with fine gravel, moist - medium dense	7	13.5-14	SS	10	
	14.0'						
		BORING COMPLETED					

THE H. C. NUTTING COMPANY
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TEST BORING REPORT

8/18/76-dn

CLIENT: Albert Skinner — ORDER No. 2150.4

PROJECT: Skinner Landfill, West Chester, Ohio — HOLE No. 4

LOCATION: As shown on plan

DRILLER: B. Ford — DRILL No. 32 — DATE STARTED: 7-29-76

ELEVATION REFERENCE: — DATE COMPLETED: 7-29-76

CASING: DIAMETER 2.25" I.D. Hollow Stem Auger — HAMMER WT. — FALL

SAMPLER: DIAMETER & TYPE 2.0" O.D. Split Spoon — HAMMER WT. 140# — FALL 30"

DEPTH TO WATER: IMMEDIATE None — UPON COMPLETION None

DEPTH TO WATER — DAYS AFTER COMPLETION Backfilled Upon — WATER USED IN DRILLING No

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER	Recov
	0'						
		2.5' Brown silty sandy clay, moist - medium stiff	1	0-1.5	SS	3-4-4	14
	2.5'		2	2.5-4	SS	5-9-9	18'
		2.5' Brown sandy silty clay with fine to coarse gravel, moist - soft					
	5.0'		3	5-6.5	SS	5-5-8	13'
		2.5' Brown clayey fine to coarse sand and gravel, moist - medium dense					
	7.5'		4	7.5-9	SS	9-15-17	18"
		2.5' Brown sandy silty clay with fine gravel and limestone fragments, moist - stiff					
	10.0'		5	10-11.5	SS	6-9-11	18"
		2.5' Brown fine to coarse sand and gravel with a trace clay, moist - medium dense					
	12.5'						

REMARKS:

Respectfully submitted,
THE H. C. NUTTING CO.

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials [illegible]

PROJECT Skinner Landfill, West Chester, Ohio HOLE No. 4

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 3" ON SAMPLER
	12.5'					
		1.5' Brown sandy silty clay with fine gravel and limestone fragments, moist - medium stiff	6	12.5-14	SS	10-19-23
	14.0'					
		BORING COMPLETED				

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 19
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TEST BORING REPORT

8/13/76-dn

CLIENT: Albert Skinner — ORDER No. 2150.4

PROJECT: Skinner Landfill, West Chester, Ohio — HOLE No. 5

LOCATION: As shown on plan

DRILLER: J. Mitchell — DRILL No. 33 — DATE STARTED: 7-29-76

ELEVATION REFERENCE: — DATE COMPLETED: 7-29-76

CASING: DIAMETER: 3.25" I.D. Hollow Stem Auger — HAMMER WT.: — FALL:

SAMPLER: DIAMETER & TYPE: 2.0" O.D. Split Spoon — HAMMER WT.: 140# — FALL: 30"

DEPTH TO WATER: IMMEDIATE: None — UPON COMPLETION: None

DEPTH TO WATER: — DAYS AFTER COMPLETION: Backfilled Upon — WATER USED IN DRILLING: No

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 3" ON SAMPLER	Recov
	0'						
		2.0' Brown sandy silty clay with fine gravel and limestone fragments, moist - medium stiff	1	0-1.5	SS	6-4-3	10
	2.0'						
		2.0' Brown sandy silty clay, moist - stiff to very stiff	2	2.5-4	SS	3-4-6	18
	4.0'						
		1.0' Brown sandy silty clay, moist - stiff, (driller's break, no sample)					
	5.0'		3	5-6.5	SS	8-9-17	8'
		4.0' Brown clayey fine to coarse sand, gravel and limestone fragments, moist - medium dense	4	7.5-9	SS	10-16-11	16'
	9.0'						
		BORING COMPLETED					

Respectfully submitted,
THE H. C. NUTTING CO.
By

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials penetrated in the boring.

GENERAL ENFORCEMENT

DRILLING LOG

State Ohio

Site Skinner Landfill

Boring No. B-5

Drilling Firm ATEC

Type of Drill

Driller

Geologist Micheal McCarrin

Start Date

Completion Date July 20, 1982

Ground El.

Groundwater El.
at completion

after ____ days

Total Depth of Boring 16.5'

Elev.	Depth	Description	Blow Count	Sample No.	Remarks
	0	GROUND SURFACE			
	1	Silty Sand, brown	4/7/23	1	damp
	2				
	3	Sandy Silty Clay, brown-tan	4/6/6	2	moist
	4				
	5				
	6		3/5/4	3	moist
	7				
	8				
	9				
	10				

State Ohio

Site Skinner Landfill

Boring No. B-5

Page 2 of 2

Elev.	Depth	Description	Blow Count	Sample No.	Remarks
	11		2/4/5	4	very moist
	12				
	13				
	14				
	15				
	16	Shale, grey End of Boring	7/13/15	5	wet
	17	Well Construction: - Screen set from 12.0 to 15.0 feet - Sand from 11.0 to 15.0 feet - Bentonite from 9.0 to 11.0 feet - Cement grout from 0.0 to 9.0 feet - Well protector casing - 2" PVC well casing - 3'-0.010" PVC screen			

DRILLING LOG

State Ohio

Site Skinner Landfill

Boring No. B-6

Drilling Firm ATEC

Type of Drill

Driller

Geologist Micheal McCarrin

Start Date July 20, 1982

Completion Date July 20, 1982

Ground El.

Groundwater El.
at completion

after ____ days

Total Depth of Boring 19.0'

Elev.	Depth	Description	Blow Count	Sample No.	Remarks
	0	GROUND SURFACE			
	1	Silty Sand, brown, with gravel	10/ 30/24	1	damp
	2				
	3		26/ 25/22	2	damp
	4				
	5				
	6		19/ 14/17	3	damp
	7				
	8	Sandy Silt, brown			
	9				
	10				

State Ohio

Site Skinner Landfill

Boring No. B-6

Page 2 of 2

Elev.	Depth	Description	Blow Count	Sample No.	Remarks
	11		16/ 21/22	4	moist
	12				
	13				
	14				
	15				
	16		7/6/8	5	wet
	17				
	18	Sand, grey	8/9/10	6	wet
	19	End of Boring			
		Well Construction: - Screen set from 16.0 to 19.0 feet - Sand from 12.0 to 19.0 feet - Bentonite from 10.0 to 12.0 feet - Cement grout from 0.0 to 9.0 feet - Well protector casing - 2" PVC well casing - 3'-0.010" PVC screen			

DRILLING LOG

State Ohio

Site Skinner Landfill

Boring No. B-7

Drilling Firm ATEC

Type of Drill

Driller

Geologist Micheal McCarrin

Start Date July 20, 1982

Completion Date July 21, 1982

Ground El.

Groundwater El.
at completion

after ____ days

Total Depth of Boring 29.0'

Elev.	Depth	Description	Blow Count	Sample No.	Remarks
	0	GROUND SURFACE			
	1	Silty Sand, brown		1	dry
	2				
	3	Clayey Silt, brown		2	damp
	4				
	5				
	6		16/30/15	3	damp
	7				
	8				
	9				
	10				

State Ohio

Site Skinner Landfill

Boring No. B-7

Page 2 of 3

Elev.	Depth	Description	Blow Count	Sample No.	Remarks
	11		17/20/30	4	moist
	12				
	13	Silty Sand, brown with gravel			
	14				
	15				
	16		18/25/29	5	moist
	17				
	18	Silty Sand, grey with gravel			
	19				
	20				
	21		8/10/12	6	wet
	22				
	23				
	24				
	25				
	26		43/40/29	7	wet
	27				
	28	Clayey Till, brown	46/36/54	8	moist
	29	End of Boring			

State Ohio

Boring No. B-7

Site Skinner Landfill

Page 3 of 3

Elev.	Depth	Description	Blow Count	Sample No.	Remarks
		Well Construction: - Screen set from 22.0 to 25.0 feet - Sand from 21.0 to 25.0 feet - Cement grout from 0.0 to 21.0 feet - Well protector casing - 2" PVC well casing - 3'-0.010" PVC screen			

DRILLING LOG

State Ohio

Site Skinner Landfill

Boring No. B-8

Drilling Firm ATEC

Type of Drill

Driller

Geologist Micheal McCarrin

Start Date July 21, 1982

Completion Date July 21, 1982

Ground El.

Groundwater El.
at completion

after ____ days

Total Depth of Boring 19.0'

Elev.	Depth	Description	Blow Count	Sample No.	Remarks
	0	GROUND SURFACE			
	1	Silty Sand, brown	12/15/15	1	dry
	2				
	3	Clayey Silt, brown with sand and gravel	26/20/14	2	dry
	4				
	5				
	6		16/30/15	3	very moist
	7				
	8				
	9				
	10				

State Ohio

Site Skinner Landfill

Boring No. B-8

Page 2 of 2

Elev.	Depth	Description	Blow Count	Sample No.	Remarks
	11		14/19/27	4	moist
	12				
	13				
	14				
	15	Shale, grey			
	16		100 for 5"	5	dry
	17				
	18				
	19	End of Boring	52/100 for 4"	6	dry
	20	Well Construction: - Boring bentonited from 15.0 to 19.0 feet - Screen set from 12.0 to 15.0 feet - Sand from 10.0 to 12.0 feet - Bentonite seal from 8.5 to 10.0 feet - Cement grout from 0.0 to 8.5 feet - Well protector casing - 2" PVC well casing - 3'-0.010" PVC screen			

Phase I Wells

WELL LOGS

WESTON

DRILLING LOG

WELL NUMBER: SLGW 06 OWNER: [illegible]

LOCATION: Near lake [illegible] ADDRESS: [illegible]

[illegible] next to Bridge [illegible]

TOTAL DEPTH: 41.0'

SURFACE ELEVATION: 623.90' WATER LEVEL:

DRILLING COMPANY: [illegible] DRILLING METHOD: HSA (Olivia) DATE DRILLED: 5/21-22/86

DRILLER: [illegible] HELPER: [illegible]

LOG BY: [illegible]

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
		S-1	SS	4 5 5	Gray to red brown clayey silt to [illegible] to sandy gravelly clay with interbedded [illegible] (cl-ml, gp)
		S-2	SS	5 4 6	
		S-3	SS	4 5 10	
		S-4	SS	5 4 7	
		S-5	SS	4 9 12	
		S-6	SS	10 8 17	14.0'
		S-7	SS	13 10 23	Green gray to gray silty clay to clayey silt, some pebbles and sand, hard, moist (cl-ml).
		S-8	SS	29 26 27	

DRILLING LOG

WELL NUMBER: SLGW06
OWNER: [illegible]
LOCATION: Near large crane next to bridge
ADDRESS: [illegible] West Chester [illegible]
TOTAL DEPTH: 41.0'
SURFACE ELEVATION: 683.90'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA coring
DATE DRILLED: 5/21-22/86
DRILLER: [illegible]
HELPER: [illegible]
LOG BY: P Porter

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
		S-9	SS	5 12 31	Green gray to gray silty clay to clayey silt, some pebbles and sand, hard [illegible]
		S-10	SS	24 31 [illegible]	
		S-11	SS	9 15 29	
		S-12	SS	10 16 24	
		S-13	SS	12 14 31	
		S-14	SS	9 16 30	
		S-15	SS	15 27/1	Interbedded gray fo[illegible] limestone and gray shale
		S-16	core	–	

* ASTM D1586

WESTON

DRILLING LOG

WELL NUMBER: SL GW06
OWNER: U.S. EPA
LOCATION: Near large crane next to bridge
ADDRESS: Skinner landfill West Chester, OH
TOTAL DEPTH: 41.0'
SURFACE ELEVATION: 683.90'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA, coring
DATE DRILLED: 5/21-22/86
DRILLER: F Moore
HELPER: B. Y
LOG BY: P Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
		S-16 cont	core	—	Interbedded gray fossiliferous limestone and gray shale. 41.0'
					END OF BORING

WESTON

DRILLING LOG

WELL NUMBER: 51GW07 OWNER: U.S. EPA

LOCATION: Near large crane next to bridge ADDRESS: Skinner Landfill West Chester, OH

TOTAL DEPTH: 16.0'

SURFACE ELEVATION: 684.10' WATER LEVEL:

DRILLING COMPANY: Moore DRILLING METHOD: HSA DATE DRILLED: 5/22/86

DRILLER: F Moore HELPER:

LOG BY: P Baitz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0					Gray to red brown clayey silt to silty clay to sandy, gravelly clay with interbedded coarse sand and gravel, moist to wet (cl-ml, gp).
10					
					14.0'
15					Green gray to gray silty clay to clayey silt some pebbles and sand, hard, moist (cl-ml)
					16.0'
					END OF BORING

* ASTM D1586

WESTON

DRILLING LOG

WELL NUMBER: SLGW08
OWNER: U.S. EPA
LOCATION: eastern access road next to creek
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 17.5'
SURFACE ELEVATION: 686.50'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA, coring
DATE DRILLED: 5/14/86
DRILLER: F. Moore
HELPER: Bill
LOG BY: L Weyer

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	1 3 6	Brown silty clay, soft, moist (cl). 1.5'
		S-2	SS	7 10 11	Very light brown to yellow brown silty, clayey fine-medium sand and gravel grading to gray-green silty, sandy, gravelly clay, medium dense, dry to moist (gm, gc)
		S-3	SS	11 15 19	
		S-4	SS	4 8 5	
10		S-5	SS	22 32/12	11.0'
		S-6	core	—	Interbedded green gray shale and dark blue-gray fossiliferous limestone
15					17.5'
					END OF BORING

* ASTM D1586

WESTON

DRILLING LOG

WELL NUMBER: SLGW09 OWNER: U.S. EPA
LOCATION: End of gravelled access road adjacent to creek ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 27.0'
SURFACE ELEVATION: 689.53' WATER LEVEL:
DRILLING COMPANY: Moore DRILLING METHOD: HSA, coring DATE DRILLED: 5/13/86
DRILLER: E. Moore HELPER: R. Y.
LOG BY: P. Bart..

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	10 35/4	Brown to gray interbedded medium-grained silty sand and silty sand and gravel with some clay, medium dense to dense, moist to wet (sm, gm)
		S-2	SS	4 12 15/2	
		S-3	SS	7 11 34	6.0'
		S-4	SS	14 21 38	Light gray sandy, silty clay grading to blue-green to green-gray sandy silt with some gravel, medium dense to dense, moist to wet (ml-sm).
10		S-5	SS	14 26 51	
		S-6	SS	7 18 26	15.0'
5		S-7	SS	35/4	Blue and green clayey silt and silty clay, hard, moist (ml, cl).
		S-8	SS	8 28 24	
20					20.0'

* A.S.T.M. D1586

WESTON

DRILLING LOG

WELL NUMBER: SLGW09
OWNER: U.S. EPA
LOCATION: End of gravelled access road adjacent to creek
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 27.0'
SURFACE ELEVATION: 689.53'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA coring
DATE DRILLED: 5/13/86
DRILLER: F. Moore
HELPER: Bill
LOG BY: P. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20					Interbedded gray fossiliferous limestone and gray-green soft shale. ▽
		5-9	core	—	
25					
					27.0'
					END OF BORING

* A.S.T.M. D1586

WESTON

DRILLING LOG

WELL NUMBER: SLGW10 OWNER: U.S. EPA
LOCATION: End of gravelled access road adjacent to creek ADDRESS: Skinner landfill West Chester, OH
TOTAL DEPTH: 14.0'
SURFACE ELEVATION: 689.48' WATER LEVEL:
DRILLING COMPANY: Moore DRILLING METHOD: HSA DATE DRILLED: 5/14/86
DRILLER: F. Moore HELPER: Bill
LOG BY: P. Barts

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0					Brown to gray interbedded medium-grained silty sand and silty sand and gravel with some clay, medium dense to dense, moist to wet (sm, gm). ▽ 6.0'
10					Light gray sandy, silty clay grading to blue-green to green-gray sandy silt with some gravel, medium dense to dense, moist to wet (ml-sm). 14.0'
					END OF BORING

* SPT N-VALUE

WESTON

DRILLING LOG

WELL NUMBER: SLGW11
OWNER: U.S. EPA
LOCATION: 100' from end of gravelled east access road
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 14.5'
SURFACE ELEVATION: 701.71'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA boring
DATE DRILLED: 5/15/86
DRILLER: E Moore
HELPER: Bill
LOG BY: L. Weyer

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	5 7 9	Brown silty clay, stiff, moist (cl).
		S-2	SS	5 4 10	▽ 4.0'
		S-3	SS	33 20 12	Light brown to orange-brown sandy, gravelly clay and clayey coarse sand and gravel, very dense, moist to wet (cl, gc)
		S-4	SS	8 22 35/4	9.0'
10		S-5	core	—	Interbedded blue-gray fossiliferous limestone and gray shale
					14.5'
					END OF BORING

* ASTM D1586

WESTON

DRILLING LOG

WELL NUMBER: SLGW12
OWNER: U.S. EPA
LOCATION: below active wall of landfill in small swamp
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 14.0'
SURFACE ELEVATION: 699.78'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA, casing
DATE DRILLED: 5/15/86
DRILLER: F Moore
HELPER: Bill
LOG BY: L Weyer

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	5 6 8	Dark brown to light yellow brown silty, sandy clay to silty clay, medium stiff to stiff, moist to wet (CL).
		S-2	SS	3 5 10	
		S-3	SS	7 12 21	6.5'
10					Interbedded shale and limestone
					14.0'
					END OF BORING

WESTON

DRILLING LOG

WELL NUMBER: SLGW13
OWNER: U.S. EPA
LOCATION: next to road on hill above gravel pit
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 59'
SURFACE ELEVATION: 757.75'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA
DATE DRILLED: 5/7-8/96
DRILLER: E. Moore
HELPER:
LOG BY: M. Jutson

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	6 7 7	Red-brown fine to coarse-grained sand to sand and gravel, some silt and some clayey layers, loose to medium dense, becoming dense to very dense below 12.5', dry to moist, (sw, gm-gc).
		S-2	SS	4 4 7	
		S-3	SS	3 4 4	
		S-4	SS	6 6 10	
10		S-5	SS	40/6	cobble
		S-6	SS	16 22 39	
15		7	SS	15 31 7	
		S-8	SS	20 13 21	
20					

WESTON

DRILLING LOG

WELL NUMBER: SLSW13 OWNER: U.S. EPA

LOCATION: next to road on hill above gravel pit ADDRESS: [illegible] landfill West [illegible] Rd, OH

TOTAL DEPTH: 59'

SURFACE ELEVATION: 757.75' WATER LEVEL:

DRILLING COMPANY: Moore DRILLING METHOD: [illegible] DATE DRILLED: 5/7-8/86

DRILLER: F. Moore HELPER: [illegible]

LOG BY: M. Hutson

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20		S-9	SS	8 14 25	Red-brown and gray fine to coarse-grained sand to sand and gravel, some silt and clayey layers, dense to very dense, dry to moist (sw, gm-gc).
		S-10	SS	16 24 33	
		S-11	SS	26 41 50/0	
		S-12	SS	19 21 35	
30		S-13	SS	10 23 54	
		S-14	SS	28 64/3	
35					
40					40.0'

* ASTM D1586

WESTON

DRILLING LOG

WELL NUMBER: SLGW13 OWNER: U.S. EPA

LOCATION: next to road on hill above gravel pit ADDRESS: Skinner Landfill West Chester, OH

TOTAL DEPTH: 59'

SURFACE ELEVATION: 757.75' WATER LEVEL:

DRILLING COMPANY: Moore DRILLING METHOD: HSA DATE DRILLED: 5/7-8/96

DRILLER: F. Moore HELPER: P. G.

LOG BY: M. Hutson

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
40					Light brown silty clay with some gravel grading to very silty, clayey fine to coarse-grained sand and gravel, very dense, moist (SW, GM-GC)
		S-15	SS	80/6	
		S-16	SS	30/6	
45		S-17	SS	50/6	
		S-18	SS	70/6	
50		S-19	SS	25 27/3	
		S-20	SS	20 39 13/2	
55					▽
					59.0' END OF BORING

* A.S.T.M. D1586

WESTON

DRILLING LOG

WELL NUMBER: SLGW14
OWNER: U.S. EPA
LOCATION: off road in quarried area, 15' below crest of hill
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 28.0'
SURFACE ELEVATION: 744.20'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA drilling
DATE DRILLED: 5/6/96
DRILLER: E. Moore
HELPER: Bill
LOG BY: P. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	6 6 8	Brown, very silty sand and gravel, some clay, medium to very dense, wet at 15', clay content increases with depth. (gc-gm).
		S-2	SS	29 50	
		S-3	SS	8 24 40	
		S-4	SS	17 18 42	
10		S-5	SS	45/1	▽
		S-6	SS	17 24 25	
15		S-7	SS	24 40 48	
		S-8	SS	12 17 17	
20					

DRILLING LOG

WELL NUMBER: SLGW14 OWNER: U.S. EPA
LOCATION: off road in quarried area, 15' below crest of hill ADDRESS: Skinner landfill West Chester, OH
TOTAL DEPTH: 28.0'
SURFACE ELEVATION: 744.20' WATER LEVEL:
DRILLING COMPANY: Moore DRILLING METHOD: HSA DATE DRILLED: 5/6/86
DRILLER: F. Moore HELPER: Bill
LOG BY: P. Burke

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20		S-9	SS	10 21 24	Brown, very silty sand and gravel with some clay, medium to very dense (gc-gm). 23.0'
		S-10	SS	11 35	Gray, fossiliferous limestone. 28.0'
25					END OF BORING

* A.S.T.M. D1586

WESTON

DRILLING LOG

WELL NUMBER: SLGW15
OWNER: U.S. EPA
LOCATION: next to split in access road in wooded area
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 18.0'
SURFACE ELEVATION: 726.88'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA, coring
DATE DRILLED: 5/5/86
DRILLER: E. Moore
HELPER: Bill
LOG BY: P. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	7 16 10	Brown to gray silty, sandy gravel with some clay, medium to very dense, dry. (gm).
		S-2	SS	46 52 11	
		S-3	SS	12 18 14	5.5' Yellow-brown silty, sandy clay, some gravel, hard, dry (cl).
		S-4	SS	7 49/6	▽
10		S-5	core	–	10.0' Interbedded gray, fossiliferous limestone and gray shale.
15					18.0' END OF BORING

WESTON

DRILLING LOG

WELL NUMBER: SLGW16 OWNER: U.S. EPA
LOCATION: four feet from main access road, next to tanks ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH 35.0'
SURFACE ELEVATION: 700.98' WATER LEVEL:

DRILLING COMPANY: Moore DRILLING METHOD: HSA, coring DATE DRILLED: 5/5/96
DRILLER: F. Moore HELPER: B. Yl

LOG BY: P. Britz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	2 2 4	Brown to red brown sandy, clayey silt to silty clay, soft to medium stiff. (CL)
		S-2	SS	4 5 6	
		S-3	SS	5 8 10	
		S-4	SS	4 5 5	
10		S-5	SS	2 3 3	▽ 12.5'
		S-6	SS	9 12 10	Brown to red brown gravelly, silty, sand to gravelly, sandy silt, medium dense to dense, wet. (GM)
5		S-7	SS	14 12 14	
		S-8	SS	15 [illegible] 10	

WOODWARD-CLYDE

DRILLING LOG

WELL NUMBER: SLGW16
OWNER: U.S. EPA
LOCATION: four feet from main access road, next to tanks
ADDRESS: Skinner landfill West Chester, OH
TOTAL DEPTH: 35.0'
SURFACE ELEVATION: 700.98'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA, coring
DATE DRILLED: 5/5/86
DRILLER: E Moore
HELPER: Bill
LOG BY: Y. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20		S-9	SS	13 30 29	Brown to red-brown gravelly, silty sand to gravelly, sandy silt, medium dense to dense, wet (gm).
					23.0'
		S-10	SS	14 12 12	Red brown to brown, sandy, clayey silt, very stiff, wet (ml).
25					
		S-11	SS	8 10 9	25.2'
					Brown, silty, gravelly sand to very coarse gravel with some sand and silt, medium dense, wet (gm-gw).
		S-12	SS	8 20 17	
					30.0
		S-13	SS	30/2	Interbedded gray, fossiliferous limestone and gray shale.
		S-14	core	—	
35					35.0'
					END OF BORING

* A.S.T.M. D1586

WESTON

DRILLING LOG

WELL NUMBER: SLGW17 OWNER: U.S. EPA
LOCATION: fifteen feet from road next to scrap metal heap ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 39.5'
SURFACE ELEVATION: 748.24' WATER LEVEL:
DRILLING COMPANY: Moore DRILLING METHOD: HSA, coring DATE DRILLED: 5/1-2/86
DRILLER: F. Moore HELPER: Bill
LOG BY: P. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	6 7 8	Brown sandy, gravelly silt, medium dense, moist (sm).
		S-2	SS	8 4 5	
		S-3	SS	5 5 6	
5		S-4	SS	2 7 8	
		S-5	SS	5 10 11	
		S-6	SS	6 4 7	9.0'
0		S-7	SS	6 12 10	Light brown, sandy, clayey silt with some gravel, medium dense, moist to wet (sc-sm).
		S-8	SS	10 11 14	
		S-9	SS	10 17 68	
		S-10		23 25	15.0'
5		S-11	SS	21 50/4"	Interbedded gray shale to pebbly shale and gray fossiliferous limestone. Shale increases in hardness with depth.
		S-12	core	—	

WESTON

DRILLING LOG

WELL NUMBER: SLGW17
OWNER: U.S. EPA
LOCATION: fifteen feet from road next to scrap metal heap
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 39.5'
SURFACE ELEVATION: 748.24'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA, coring
DATE DRILLED: 5/1-2/96
DRILLER: F. Moore
HELPER: Bill
LOG BY: P. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20		S-12 cont.	core	–	Interbedded gray shale to pebbly shale and gray, fossiliferous limestone.
					▽
25		S-13	core	–	
30		S-14	core	–	
35		S-15	core	–	
					39.5' END OF BORING

* A.S.T.M. D1586

WESTON

DRILLING LOG

WELL NUMBER: SL GW18
OWNER: U.S. EPA
LOCATION: fifteen feet from road next to scrap metal heap
ADDRESS: Skinner Landfill, West Chester, OH
TOTAL DEPTH: 27.7'
SURFACE ELEVATION: 748.39'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA, coring
DATE DRILLED: 5/2-3/86
DRILLER: F. Moore
HELPER: Bill
LOG BY: P. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0					Brown sandy, gravelly silt, medium dense, moist (sm). 9.0'
10					Light brown sandy, clayey silt with some gravel, medium dense, moist to wet (sc-sm). 15.0'
15					Interbedded gray shale to pebbly shale and gray, fossiliferous limestone.
20					

WESTON

DRILLING LOG

WELL NUMBER: SL GW18
OWNER: U.S. EPA
LOCATION: fifteen feet from road next to scrap metal heap
ADDRESS: Skinner Landfill, West Chester, OH
TOTAL DEPTH: 27.7'
SURFACE ELEVATION: 748.39'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA coring
DATE DRILLED: 9/2-3/86
DRILLER: E. Moore
HELPER: Bill
LOG BY: P. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20					Interbedded gray shale to pebbly shale and gray, fossiliferous limestone.
25					27.7'
					END OF BOKING
30					

* A.S.T.M. D1586

DRILLING LOG

WELL NUMBER: SLGW19 OWNER: U.S. EPA
LOCATION: Near lagoon (southern well) ADDRESS: Skinner Land-fill West Chester, OH
TOTAL DEPTH: 42.0'
SURFACE ELEVATION: 731.51' WATER LEVEL:
DRILLING COMPANY: Moore DRILLING METHOD: HSA coring DATE DRILLED: 5/20/86
DRILLER: F Moore HELPER: Bill
LOG BY: P Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	4 6 7	Light brown and red medium to coarse sand and gravel grading to silty sand and gravel, some interbedded sandy, silty day, loose to medium dense, moist (gp-gm, cl).
		S-2	SS	11 4 10	
		S-3	SS	15 12/2	
		S-4	SS	13 17 33	
10		S-5	SS	10 16 16	
		S-6	SS	16 16 20	13.0' Gray silty, sandy clay, some gravel, grading to clayey, gravelly silt, stiff to very stiff, moist to wet (cl-ml). Gravel and sand content increase with depth, contains some sand and clay layers
1[illegible]		S-7	SS	12 12 15	
		S-8	SS	8 7 9	
[illegible]					

WESTON

DRILLING LOG

WELL NUMBER: SLGW19
OWNER: U.S. EPA
LOCATION: Near lagoon (Southern well)
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 42.0'
SURFACE ELEVATION: 731.51'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA, cerico
DATE DRILLED: 5/20/86
DRILLER: F. Moore
HELPER: Bill
LOG BY: P. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20		S-9	SS	7 4 7	Gray silty clay to clayey, sandy gravelly silt with interbedded fine to coarse-grained sand and fine gravels and some thin clay layers, very stiff to hard (cl-ml, gm, gc).
		S-10	SS	10 9 9	
25		S-11	--	15 16 9	
		S-12	--	7 7 12	
30		S-13		12 22 21	
		S-14	SS	11 17 19	
35		S-15	SS	10 29 33	
		S-16	SS	20 22 18	
40					40.0'

* A.S.T.M. D1586

WESTON

DRILLING LOG

WELL NUMBER: SLGW19
OWNER: U.S. EPA
LOCATION: near lagoon (southern well)
ADDRESS: Skinner landfill
TOTAL DEPTH: 42.0'
SURFACE ELEVATION: 731.51'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA coring
DATE DRILLED: 5/20/86
DRILLER: F. Moore
HELPER: Bill
LOG BY: P. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
40		S-17	SS	27 35/12	Gray limestone
					42.0'
					END OF BORING

WESTON

DRILLING LOG

WELL NUMBER: SLGW20
OWNER: U.S. EPA
LOCATION: near lagoon (central well)
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 52.0'
SURFACE ELEVATION: 734.79'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA
DATE DRILLED: 5/17,18/86
DRILLER: F. Moore
HELPER: Bill
LOG BY: L. Weyer

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	5 9 8	Light brown to red brown clay, silty clay, and clayey silt, some sand and gravel, medium stiff to stiff, moist (ch, cl, ml).
		S-2	SS	3 3 6	
5		S-3	SS	5 5 10	
		S-4	SS	8 12 18	
10		S-5	SS	28 22 16	11.0'
		S-6	SS	12 12 9	Light brown coarse sand and gravel grading to silt fine sand, medium dense, dry (gp-sm)
15		S-7	SS	10 16 15	17.5'
		S-8	SS	19 36 30	Light brown to gray gravelly clay with some silt, very stiff to hard, wet (cl).

WOOD

DRILLING LOG

WELL NUMBER: SLGW20 OWNER: US EPA
LOCATION: near lagoon (central well) ADDRESS: Skinner landfill West Chester, OH
TOTAL DEPTH: 52.0'
SURFACE ELEVATION: 734.79' WATER LEVEL:
DRILLING COMPANY: Moore DRILLING METHOD: HSA DATE DRILLED: 5/17-19/86
DRILLER: F. Moore HELPER: Bill
LOG BY: L. Weyer

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20		S-9	SS	8 9 24	Light brown to gray gravelly clay with some silt, very stiff to hard, wet (CL). 21.5'
		S-10	SS	16 19 17	Gray medium to very coarse-grained sand and fine to medium gravel, medium dense to dense, dry to 36', then wet (SW-GW)
25		S-11	SS	12 26 21	
		S-12	SS	7 8 12	
		S-13	SS	17 19 14	
		S-14	SS	8 8 8	
35		S-15	SS	24 22 20	
		S-16	SS	11 10 8	
40					

* A.S.T.M. D1586

SHEET 2 OF 2

WESTON

DRILLING LOG

WELL NUMBER: SLGW20 OWNER: U.S. EPA

LOCATION: near lagoon (central well) ADDRESS: Skinner landfill West Chester, OH

TOTAL DEPTH: 52.0'

SURFACE ELEVATION: 734.79' WATER LEVEL:

DRILLING COMPANY: Moore DRILLING METHOD: HSA DATE DRILLED: 5/17,19/86

DRILLER: F. Moore HELPER: Bill

LOG BY: L. Weyer

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
10		S-17	SS	9 11 9	Gray medium to very coarse sand and fine to medium gravel, medium dense to dense, wet (SW-GW)
		S-15	SS	12 2 10	
		S-11	SS	6 7 6	
50		S-5	SS	10 11 14	51.0'
					Light brown gray gravelly clay, stiff (CL). 52.0'
					END OF BORING

WESTON

DRILLING LOG

WELL NUMBER: SLGW21
OWNER: U.S. EPA
LOCATION: behind active dump adjacent to lagoon (northern well)
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 35.0'
SURFACE ELEVATION: 732.08'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA, coring
DATE DRILLED: 5/16/86
DRILLER: F. Moore
HELPER: Bill
LOG BY: L. Weyer

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	2 2 3	Orange brown and green gray silty, sandy clay with trace gravel with interbedded red and yellow brown clayey coarse sand and gravel, clay - soft and sand and gravel medium dense, moist to wet (cl, gc)
		S-2	SS	6 11 8	
		S-3	SS	9 9 12	
		S-4	SS	8 12 17	
10		S-5	SS	18 27 28	11.0'
		S-6	SS	18 28 22	Red brown, orange-brown, and gray medium sand and gravel and silty, clayey sand and gravel with interbedded sandy, gravelly clay; dense, dry (gp-gm, cl).
15		S-7	SS	18 24 22	
		S-8	SS	14 24 24	19.0'

See next page

DRILLING LOG

WELL NUMBER: SLGW21
OWNER: U.S. EPA
LOCATION: Behind active dump, adjacent to lagoon (northern well)
ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 35.0'
SURFACE ELEVATION: 732.08'
WATER LEVEL:
DRILLING COMPANY: Moore
DRILLING METHOD: HSA, roung
DATE DRILLED: 5/16/96
DRILLER: E. Moore
HELPER: Bill
LOG BY: L. Weyer

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20		S-9	SS	23 27 30	Gray gravelly, clayey silt and gray and brown sandy, gravelly clay; hard, moist to wet (ml-cl).
		S-10	SS	14 30 44	
25		S-11	SS	20 23 24	
		S-12	SS	16 43 11	
		S-13	SS	70/4	Interbedded gray shale and blue gray fossiliferous limestone.
35					END OF BORING

30.0'

35.0'

* A.S.T.M. D1586

WESTON

DRILLING LOG

WELL NUMBER: SL GW22 OWNER: U.S. EPA
LOCATION: On active landfill, near large concrete block ADDRESS: Skinner Landfill West Chester OH
TOTAL DEPTH: 34.0'
SURFACE ELEVATION: 747.64' WATER LEVEL:
DRILLING COMPANY: Moore DRILLING METHOD: HSA, coring DATE DRILLED: 5/4/86
DRILLER: F. Moore HELPER: P. Ill
LOG BY: P. Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	3 4 2	Brown, gray, and black sandy, gravelly silt to silty clay fill, some brown staining, medium stiff, wet below 10'. (sm-cl).
		S-2	SS	2 4 7	
		S-3	SS	2 3 3	
		S-4	SS	3 3 9	
10		S-5	SS	4 5 6	
		S-6	SS	5 5 14	
15		S-7	SS	8 15 45	15.5' Brown silty clay to clay, very stiff, moist (cl).
		S-8	SS	27/2	19.0'
		S-9	core	-	Interbedded gray fossiliferous limestone and gray shale

WOODWARD-CLYDE

DRILLING LOG

WELL NUMBER: SLGW22 OWNER: U.S. EPA

LOCATION: On active landfill, near large concrete blocks ADDRESS: Skinner Landfill West Chester, OH

TOTAL DEPTH 24.0'

SURFACE ELEVATION: 747.69' WATER LEVEL:

DRILLING COMPANY: Moore DRILLING METHOD: HSA drilling DATE DRILLED: 5/4/86

DRILLER: F. Moore HELPER: F.M.

LOG BY: P. Baitz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
20		S-9 cont	core	—	Interbedded gray, fossiliferous limestone and gray, hard shale. 24.0'
					END OF BORING

* A.S.T.M. D1586

SHEET 2 OF 2

WESTON

DRILLING LOG

WELL NUMBER: SL6UU23 OWNER: U.S. EPA
LOCATION: Beyond active landfill on access road ADDRESS: Skinner Landfill West Chester, OH
TOTAL DEPTH: 15.0'
SURFACE ELEVATION: 768.27' WATER LEVEL:
DRILLING COMPANY: Moore DRILLING METHOD: HSA DATE DRILLED: 4/29-30/86
DRILLER: E. Moore HELPER: Bill
LOG BY: Paul Bartz

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		S-1	SS	2 3 4	Light brown silty clay to clay, stiff, moist, trace gravel. (ml-cl)
		S-2	SS	9 8 31	▽
		[illegible]	SS	8 10 26	
		S-4	SS	17 15 21	
10		S-5	SS	—	10.0' Gray shale with interbedded blue-gray fossiliferous limestone. (layers 1-3" thick)
		S-6	core	—	
					14.4'
5					END OF BORING

WELL CONSTRUCTION DETAILS

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. P. Bartz DATE 6/2/86
PROJECT NO. 130-RTI-STEVL CHECKED BY _____ DATE _____
BORING NO. SLGW06
PIEZOMETER NO. SLGW06 DATE OF INSTALLATION 5/21-22/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock coring
DRILLING FLUID (S) USED:
FLUID water FROM 36.0' TO 41.0'
FLUID _____ FROM _____ TO _____

TYPE OF BIT _____
CASING SIZE (S) USED: NONE
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2"
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.010"
TOTAL PERFORATED AREA 5'

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS:
O.D. _____ I.D. 2"
LENGTH OF PIPE SECTIONS 10'
JOINING METHOD flush thread

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'
PROTECTIVE PIPE O.D. 4"

OTHER PROTECTION Locking

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	+2		687.96	
GROUND SURFACE	0.0		683.90	
BOTTOM OF PROTECTIVE PIPE	—		682.96	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 26.5	TOP 683.90	BOTTOM 657.40
BENTONITE	TOP 26.5	BOTTOM 28.5	TOP 657.40	BOTTOM 655.40
SAND	TOP 28.5	BOTTOM 35.5	TOP 655.40	BOTTOM 648.40
CAVED SOIL	TOP 36.5	BOTTOM 41.0	TOP 648.40	BOTTOM 642.90
PERFORATED SECTION	TOP 30.5	BOTTOM 35.5	TOP 653.40	BOTTOM 648.40
PIEZOMETER TIP	35.5		648.40	
BOTTOM OF BOREHOLE	41.0		642.90	
GWL AFTER INSTALLATION	35'		648.90	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS sackrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. P Bartz DATE 6/2/86
PROJECT NO. 130-RI1-SIEVL CHECKED BY _____ DATE _____
BORING NO. SLGW07
PIEZOMETER NO. SLGW07 DATE OF INSTALLATION 5/22/86

BOREHOLE DRILLING

DRILLING METHOD HSA	TYPE OF BIT _____
DRILLING FLUID (S) USED: NONE	CASING SIZE (S) USED: NONE
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC	RISER PIPE MATERIAL PVC
DIAMETER OF PERFORATED SECTION 2"	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. _____ I.D. 2"
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 10'
AVERAGE SIZE OF PERFORATIONS 0.010"	JOINING METHOD flush-thread
TOTAL PERFORATED AREA 10'	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5.0'	OTHER PROTECTION Lock
PROTECTIVE PIPE O.D. 4"	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	-4		687.63	
GROUND SURFACE	0.0		684.10	
BOTTOM OF PROTECTIVE PIPE	—		682.63	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 3	TOP 684.10	BOTTOM 681.10
BENTONITE	TOP 3	BOTTOM 5	TOP 681.10	BOTTOM 679.10
SAND	TOP 5	BOTTOM 16	TOP 679.10	BOTTOM 668.1
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 6	BOTTOM 16	TOP 678.10	BOTTOM 668.1
PIEZOMETER TIP	16		668.10	
BOTTOM OF BOREHOLE	16		668.10	
GWL AFTER INSTALLATION	5.9		678.20	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. L Weyer DATE 6/2/86
PROJECT NO. 130-RTI- SIEVL CHECKED BY _____ DATE _____
BORING NO. SLGW08
PIEZOMETER NO. SLGW08 DATE OF INSTALLATION 5/14/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock core	TYPE OF BIT _____
DRILLING FLUID (S) USED:	CASING SIZE (S) USED: NONE
FLUID WATER FROM 12 TO 17.5	SIZE _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC	RISER PIPE MATERIAL PVC
DIAMETER OF PERFORATED SECTION 2"	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. _____ I.D. 2"
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 10'
AVERAGE SIZE OF PERFORATIONS 0.010"	JOINING METHOD flush thread
TOTAL PERFORATED AREA 10'	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'	OTHER PROTECTION Lock
PROTECTIVE PIPE O.D. 4"	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~2.8		689.22	
GROUND SURFACE	0.0		686.50	
BOTTOM OF PROTECTIVE PIPE	—		684.22	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 3.5	TOP 686.50	BOTTOM 683.00
BENTONITE	TOP 3.5	BOTTOM 5.5	TOP 683.00	BOTTOM 681.00
SAND	TOP 5.5	BOTTOM 17.5	TOP 681.00	BOTTOM 669.00
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 7.5	BOTTOM 17.5	TOP 679.00	BOTTOM 669.00
PIEZOMETER TIP	17.5		669.00	
BOTTOM OF BOREHOLE	17.5		669.00	
GWL AFTER INSTALLATION	14.5		672.00	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS Sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner landfill FIELD ENG./GEO. P Bartz DATE 6/2/86
PROJECT NO. 130-RTI-STEVL CHECKED BY _____ DATE _____
BORING NO. SLGW09
PIEZOMETER NO. SLGW09 DATE OF INSTALLATION 5/13/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock core
DRILLING FLUID (S) USED:
FLUID water FROM 20' TO 27'
FLUID _____ FROM _____ TO _____

TYPE OF BIT _____
CASING SIZE (S) USED: NONE
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2"
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.010"
TOTAL PERFORATED AREA 5'

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS:
O.D. _____ I.D. 2"
LENGTH OF PIPE SECTIONS 10'
JOINING METHOD flush thread

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'
PROTECTIVE PIPE O.D. 4"

OTHER PROTECTION Lock

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~3.4		693.24	
GROUND SURFACE	0.0		689.53	
BOTTOM OF PROTECTIVE PIPE	—		688.24	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 17	TOP 689.53	BOTTOM 672.53
BENTONITE	TOP 17	BOTTOM 19	TOP 672.53	BOTTOM 670.53
SAND	TOP 19	BOTTOM 27	TOP 670.53	BOTTOM 662.53
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 21	BOTTOM 26	TOP 668.53	BOTTOM 663.5
PIEZOMETER TIP	26		663.53	
BOTTOM OF BOREHOLE	27		662.53	
GWL AFTER INSTALLATION	21		668.53	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS Sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill
PROJECT NO. 130-RII-STEVI
BORING NO. SLGW10
PIEZOMETER NO. SLGW10

FIELD ENG./GEO. L Weyer DATE 6/2/86
CHECKED BY _____ DATE _____
DATE OF INSTALLATION 5/14/86

BOREHOLE DRILLING

DRILLING METHOD HSA
DRILLING FLUID (S) USED: NONE
FLUID _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____

TYPE OF BIT _____
CASING SIZE (S) USED: NONE
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2"
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.010"
TOTAL PERFORATED AREA 10

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS:
O.D. _____ I.D. 2"
LENGTH OF PIPE SECTIONS 10'
JOINING METHOD flush - thread

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'
PROTECTIVE PIPE O.D. 4"

OTHER PROTECTION Lock

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~0.8		691.43	
GROUND SURFACE	0.0		689.48	
BOTTOM OF PROTECTIVE PIPE	—		686.43	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 2	TOP 689.48	BOTTOM 687.48
BENTONITE	TOP 2	BOTTOM 3	TOP 687.48	BOTTOM 686.48
SAND	TOP 3	BOTTOM 14	TOP 686.48	BOTTOM 675.48
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 4	BOTTOM 14	TOP 685.48	BOTTOM 675.48
PIEZOMETER TIP	14		675.48	
BOTTOM OF BOREHOLE	14		675.48	
GWL AFTER INSTALLATION	2.8		686.68	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS Sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill
PROJECT NO. 130-RTI-SIEVI
BORING NO. SLGW11
PIEZOMETER NO. SLGW11

FIELD ENG./GEO. L Weyer DATE 6/2/86
CHECKED BY _____ DATE _____
DATE OF INSTALLATION 5/15/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock core	TYPE OF BIT _____
DRILLING FLUID (S) USED:	CASING SIZE (S) USED: NONE
FLUID water FROM 10 TO 15	SIZE _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC	RISER PIPE MATERIAL PVC
DIAMETER OF PERFORATED SECTION 2"	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. _____ I.D. 2"
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 10'
AVERAGE SIZE OF PERFORATIONS 0.010"	JOINING METHOD flush thread
TOTAL PERFORATED AREA 10'	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'	OTHER PROTECTION Lock
PROTECTIVE PIPE O.D. 4"	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~4.4		706.19	
GROUND SURFACE	0.0		701.71	
BOTTOM OF PROTECTIVE PIPE	—		701.19	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 2	TOP 701.71	BOTTOM 699.71
BENTONITE	TOP 2	BOTTOM 3	TOP 699.71	BOTTOM 698.71
SAND	TOP 3	BOTTOM 14.5	TOP 698.71	BOTTOM 687.21
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 4.5	BOTTOM 14.5	TOP 697.21	BOTTOM 687.21
PIEZOMETER TIP	14.5		687.21	
BOTTOM OF BOREHOLE	14.5		687.21	
GWL AFTER INSTALLATION	2.8		698.91	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS Sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. L Weyer DATE 6/2/86
PROJECT NO. 130-RI1-SIEVL CHECKED BY _____ DATE _____
BORING NO. SLGW12
PIEZOMETER NO. SLGW12 DATE OF INSTALLATION 5/15/86

BOREHOLE DRILLING

DRILLING METHOD HSA, solid stem
DRILLING FLUID (S) USED: NONE
FLUID _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____

TYPE OF BIT _____
CASING SIZE (S) USED: NONE
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2"
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.010"
TOTAL PERFORATED AREA 10'

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS:
O.D. _____ I.D. 2"
LENGTH OF PIPE SECTIONS 10'
JOINING METHOD flush-thread

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'
PROTECTIVE PIPE O.D. 4"

OTHER PROTECTION Lock

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~4.2		704.08	
GROUND SURFACE	0.0		699.78	
BOTTOM OF PROTECTIVE PIPE	—		699.08	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 2	TOP 699.78	BOTTOM 697.78
BENTONITE	TOP 2	BOTTOM 3	TOP 697.78	BOTTOM 696.78
SAND	TOP 3	BOTTOM 14	TOP 696.78	BOTTOM 685.78
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 4	BOTTOM 14	TOP 695.78	BOTTOM 685.78
PIEZOMETER TIP	14		685.78	
BOTTOM OF BOREHOLE	14		685.78	
GWL AFTER INSTALLATION	1.4		698.38	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS Sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. M Hutson DATE 6/2/86
PROJECT NO. 130-RTI-STEVL CHECKED BY _____ DATE _____
BORING NO. SLGW13
PIEZOMETER NO. SLGW13 DATE OF INSTALLATION 5/9/86

BOREHOLE DRILLING

DRILLING METHOD HSA	TYPE OF BIT _____
DRILLING FLUID (S) USED: NONE	CASING SIZE (S) USED: NONE
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC	RISER PIPE MATERIAL PVC
DIAMETER OF PERFORATED SECTION 2"	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. _____ I.D. 2"
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 10'
AVERAGE SIZE OF PERFORATIONS 0.010"	JOINING METHOD flush-thread
TOTAL PERFORATED AREA 10'	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'	OTHER PROTECTION Lock
PROTECTIVE PIPE O.D. 4"	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~1.5		758.90	
GROUND SURFACE	0.0		757.75	
BOTTOM OF PROTECTIVE PIPE	—		753.90	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 35	TOP 757.75	BOTTOM 722.75
BENTONITE	TOP 35	BOTTOM 37	TOP 722.75	BOTTOM 720.75
SAND	TOP 37	BOTTOM 53	TOP 720.75	BOTTOM 704.75
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 43	BOTTOM 53	TOP 714.75	BOTTOM 704.75
PIEZOMETER TIP	53		704.75	
BOTTOM OF BOREHOLE	59		698.75	
GWL AFTER INSTALLATION	52.85		704.90	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS Sakrete runoff apron

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. P Bartz DATE 6/2/86
PROJECT NO. 130-RI1-STEV1 CHECKED BY _____ DATE _____
BORING NO. SLGW14
PIEZOMETER NO. SLGW14 DATE OF INSTALLATION 5/6/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock core	TYPE OF BIT _____
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID WATER FROM 23' TO 28'	SIZE _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC	RISER PIPE MATERIAL PVC
DIAMETER OF PERFORATED SECTION 2"	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. _____ I.D. 2"
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 10'
AVERAGE SIZE OF PERFORATIONS 0.010"	JOINING METHOD flush thread
TOTAL PERFORATED AREA 10'	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'	OTHER PROTECTION Lock
PROTECTIVE PIPE O.D. 4"	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~3'		746.92	
GROUND SURFACE	0.0		744.20	
BOTTOM OF PROTECTIVE PIPE	—		741.92	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 6	TOP 746.92	BOTTOM 740.92
BENTONITE	TOP 6	BOTTOM 8	TOP 740.92	BOTTOM 738.92
SAND	TOP 8	BOTTOM 20	TOP 738.92	BOTTOM 724.20
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 10	BOTTOM 20	TOP 734.20	BOTTOM 724.20
PIEZOMETER TIP	20		724.20	
BOTTOM OF BOREHOLE	28		716.20	
GWL AFTER INSTALLATION	10.8		733.40	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner landfill FIELD ENG./GEO. P Bartz DATE 6/2/8
PROJECT NO. 130-RII-SIEVL CHECKED BY _____ DATE _____
BORING NO. SLGW15
PIEZOMETER NO. SLGW15 DATE OF INSTALLATION 5/5/86

BOREHOLE DRILLING

DRILLING METHOD HSA, coring	TYPE OF BIT _____
DRILLING FLUID (S) USED:	CASING SIZE (S) USED: NONE
FLUID water FROM 10 TO 18	SIZE _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC	RISER PIPE MATERIAL PVC
DIAMETER OF PERFORATED SECTION 2"	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. _____ I.D. 2"
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 10'
AVERAGE SIZE OF PERFORATIONS 0.010	JOINING METHOD flush thread
TOTAL PERFORATED AREA 10'	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'	OTHER PROTECTION Lock
PROTECTIVE PIPE O.D. 4"	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~3.1		729.65	
GROUND SURFACE	0.0		726.88	
BOTTOM OF PROTECTIVE PIPE	—		724.65	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 4	TOP 726.88	BOTTOM 722.88
BENTONITE	TOP 4	BOTTOM 6	TOP 722.88	BOTTOM 720.88
SAND	TOP 6	BOTTOM 18	TOP 720.88	BOTTOM 708.88
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 8	BOTTOM 18	TOP 718.88	BOTTOM 708.88
PIEZOMETER TIP	18		708.88	
BOTTOM OF BOREHOLE	18		708.88	
GWL AFTER INSTALLATION	7.71		719.17	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS Sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. P Bartz DATE 6/2/86
PROJECT NO. 130-RI1-STEV6 CHECKED BY _____ DATE _____
BORING NO. SLGW16
PIEZOMETER NO. SLGW16 DATE OF INSTALLATION 5/5/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock core
DRILLING FLUID (S) USED:
FLUID water FROM 30 TO 35
FLUID _____ FROM _____ TO _____

TYPE OF BIT _____
CASING SIZE (S) USED: NONE
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2"
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.010
TOTAL PERFORATED AREA 10'

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS:
O.D. _____ I.D. 2"
LENGTH OF PIPE SECTIONS 10'
JOINING METHOD flush-thread

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'
PROTECTIVE PIPE O.D. 4"

OTHER PROTECTION Lock

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~2.8		703.56	
GROUND SURFACE	0.0		700.98	
BOTTOM OF PROTECTIVE PIPE	—		698.56	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 6	TOP 700.98	BOTTOM 694.98
BENTONITE	TOP 6	BOTTOM 8	TOP 694.98	BOTTOM 692.98
SAND	TOP 8	BOTTOM 20	TOP 692.98	BOTTOM 680.98
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 10	BOTTOM 20	TOP 690.98	BOTTOM 680.98
PIEZOMETER TIP	20		680.98	
BOTTOM OF BOREHOLE	35		665.98	
GWL AFTER INSTALLATION	10.4		690.58	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill
PROJECT NO. 130-RI1-SIEVL
BORING NO. SLGW17
PIEZOMETER NO. SLGW17

FIELD ENG./GEO. P. Bartz DATE 6/2/86
CHECKED BY _____ DATE _____
DATE OF INSTALLATION 5/2-3/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock core
DRILLING FLUID (S) USED:
FLUID WATER FROM 15.9 TO 40.0
FLUID _____ FROM _____ TO _____

TYPE OF BIT _____
CASING SIZE (S) USED: NONE
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2"
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.010"
TOTAL PERFORATED AREA 5'

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS:
O.D. _____ I.D. 2"
LENGTH OF PIPE SECTIONS 10'
JOINING METHOD flush thread

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'
PROTECTIVE PIPE O.D. 4"

OTHER PROTECTION Lock

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~2.7		750.83	
GROUND SURFACE	0.0		748.24	
BOTTOM OF PROTECTIVE PIPE	—		745.83	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 14	TOP 748.24	BOTTOM 734.24
BENTONITE	TOP 14	BOTTOM 16	TOP 734.24	BOTTOM 732.2[illegible]
SAND	TOP 16	BOTTOM 40	TOP 732.24	BOTTOM 708.2[illegible]
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 34.5	BOTTOM 39.5	TOP 713.75	BOTTOM 708.7[illegible]
PIEZOMETER TIP	39.5		708.75	
BOTTOM OF BOREHOLE	40.0		708.24	
GWL AFTER INSTALLATION	22.7		725.54	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. P. Bartz DATE 6/2/86
PROJECT NO. 130-RTI-SIEVL CHECKED BY _____ DATE _____
BORING NO. SLGW 18
PIEZOMETER NO. SLGW 18 DATE OF INSTALLATION 5/3/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock core
DRILLING FLUID (S) USED:
FLUID WATER FROM 17 TO 27.5
FLUID _____ FROM _____ TO _____

TYPE OF BIT _____
CASING SIZE (S) USED: NONE
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2"
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.010
TOTAL PERFORATED AREA 10'

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS:
O.D. _____ I.D. 2"
LENGTH OF PIPE SECTIONS 10'
JOINING METHOD flush-thread

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'
PROTECTIVE PIPE O.D. 4"

OTHER PROTECTION Lock

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~2.3		750.59	
GROUND SURFACE	0.0		748.39	
BOTTOM OF PROTECTIVE PIPE	—		745.59	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 12	TOP 748.39	BOTTOM 736.39
BENTONITE	TOP 12	BOTTOM 14.5	TOP 736.39	BOTTOM 733.89
SAND	TOP 14.5	BOTTOM 27	TOP 733.89	BOTTOM 721.39
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 17	BOTTOM 27	TOP 731.39	BOTTOM 721.39
PIEZOMETER TIP	27		721.39	
BOTTOM OF BOREHOLE	27		721.39	
GWL AFTER INSTALLATION	19.6		728.79	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. P Bartz DATE 6/2/86
PROJECT NO. 130-RTI-STEVL CHECKED BY _____ DATE _____
BORING NO. SLGW19
PIEZOMETER NO. SLGW19 DATE OF INSTALLATION 5/20/86

BOREHOLE DRILLING

DRILLING METHOD HSA	TYPE OF BIT _____
DRILLING FLUID (S) USED: NONE	CASING SIZE (S) USED: NONE
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE Stainless steel	RISER PIPE MATERIAL Stainless steel
DIAMETER OF PERFORATED SECTION 2"	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. _____ I.D. 2"
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 10'
AVERAGE SIZE OF PERFORATIONS 0.010	JOINING METHOD flush-thread
TOTAL PERFORATED AREA 10'	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'	OTHER PROTECTION Lock
PROTECTIVE PIPE O.D. 4"	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~3		734.37	
GROUND SURFACE	0.0		731.51	
BOTTOM OF PROTECTIVE PIPE	—		729.37	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 18	TOP 731.51	BOTTOM 713.51
BENTONITE	TOP 18	BOTTOM 20	TOP 713.51	BOTTOM 711.51
SAND	TOP 20	BOTTOM 32	TOP 711.51	BOTTOM 699.51
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 22	BOTTOM 32	TOP 709.51	BOTTOM 699.51
PIEZOMETER TIP	32		699.51	
BOTTOM OF BOREHOLE	42		689.51	
GWL AFTER INSTALLATION	18.1		713.41	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill
PROJECT NO. 130-RI1-STEVL
BORING NO. SLGW20
PIEZOMETER NO. SLGW20

FIELD ENG./GEO. L. Weyer DATE 6/2/86
CHECKED BY _____ DATE _____
DATE OF INSTALLATION 5/19, 21/86

BOREHOLE DRILLING

DRILLING METHOD HSA
DRILLING FLUID (S) USED: NONE
FLUID _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____

TYPE OF BIT _____
CASING SIZE (S) USED: NONE
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE Stainless Steel
DIAMETER OF PERFORATED SECTION 2"
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.010
TOTAL PERFORATED AREA 10'

RISER PIPE MATERIAL Stainless Steel
RISER PIPE DIAMETERS:
O.D. _____ I.D. 2"
LENGTH OF PIPE SECTIONS 10'
JOINING METHOD flush thread

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'
PROTECTIVE PIPE O.D. 4"

OTHER PROTECTION Lock

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~3.5		738.03	
GROUND SURFACE	0.0		734.79	
BOTTOM OF PROTECTIVE PIPE	—		733.03	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 38	TOP 734.79	BOTTOM 696.79
BENTONITE	TOP 38	BOTTOM 39	TOP 696.79	BOTTOM 695.79
SAND	TOP 39	BOTTOM 52	TOP 695.79	BOTTOM 682.79
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 42	BOTTOM 52	TOP 692.79	BOTTOM 682.79
PIEZOMETER TIP	52		682.79	
BOTTOM OF BOREHOLE	52		682.79	
GWL AFTER INSTALLATION	37.15		697.64	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS Sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill
PROJECT NO. 130-RI1-STEVL
BORING NO. SLGW21
PIEZOMETER NO. SLGW21

FIELD ENG./GEO. L Weyer DATE 6/2/86
CHECKED BY _____ DATE _____
DATE OF INSTALLATION 5/16/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock core
DRILLING FLUID (S) USED:
FLUID water FROM 29.5 TO 34.5
FLUID _____ FROM _____ TO _____

TYPE OF BIT _____
CASING SIZE (S) USED: NONE
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE Stainless steel
DIAMETER OF PERFORATED SECTION 2"
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.010"
TOTAL PERFORATED AREA 10'

RISER PIPE MATERIAL Stainless steel
RISER PIPE DIAMETERS:
O.D. _____ I.D. 2"
LENGTH OF PIPE SECTIONS 10'
JOINING METHOD flush thread

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'
PROTECTIVE PIPE O.D. 4"

OTHER PROTECTION Lock

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~3.4'		735.43	
GROUND SURFACE	0.0		732.08	
BOTTOM OF PROTECTIVE PIPE	—		730.43	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 13	TOP 732.08	BOTTOM 719.08
BENTONITE	TOP 13	BOTTOM 15	TOP 719.08	BOTTOM 717.08
SAND	TOP 15	BOTTOM 27	TOP 717.08	BOTTOM 705.08
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 17	BOTTOM 27	TOP 715.08	BOTTOM 705.08
PIEZOMETER TIP	27		705.08	
BOTTOM OF BOREHOLE	35		697.08	
GWL AFTER INSTALLATION	19.3		712.78	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS Sakrete runoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. P Bartz DATE 6/2/86
PROJECT NO. 130-RI1-SIEVL CHECKED BY _____ DATE _____
BORING NO. SLGW22
PIEZOMETER NO. SLGW22 DATE OF INSTALLATION 5/4/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock core	TYPE OF BIT _____
DRILLING FLUID (S) USED:	CASING SIZE (S) USED: NONE
FLUID WATER FROM 19 TO 24	SIZE _____ FROM _____ TO _____
FLUID _____ FROM _____ TO _____	SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC	RISER PIPE MATERIAL PVC
DIAMETER OF PERFORATED SECTION 2"	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. _____ I.D. 2"
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 10'
AVERAGE SIZE OF PERFORATIONS 0.010	JOINING METHOD flush-thread
TOTAL PERFORATED AREA 10'	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'	OTHER PROTECTION Lock
PROTECTIVE PIPE O.D. 4"	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~3		750.40	
GROUND SURFACE	0.0		747.64	
BOTTOM OF PROTECTIVE PIPE	—		745.40	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 5	TOP 747.64	BOTTOM 742.64
BENTONITE	TOP 5	BOTTOM 7	TOP 742.64	BOTTOM 740.64
SAND	TOP 7	BOTTOM 19	TOP 740.64	BOTTOM 728.64
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 9	BOTTOM 19	TOP 738.64	BOTTOM 728.64
PIEZOMETER TIP	19		728.64	
BOTTOM OF BOREHOLE	24		723.64	
GWL AFTER INSTALLATION	5.15		742.09	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS sakrete runnoff apron

WESTON

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Skinner Landfill FIELD ENG./GEO. P. Bartz DATE 6/2/86
PROJECT NO. 130 RI1-SIEVL CHECKED BY _____ DATE _____
BORING NO. SLGW23
PIEZOMETER NO. SLGW23 DATE OF INSTALLATION 4/30/86

BOREHOLE DRILLING

DRILLING METHOD HSA, rock core
DRILLING FLUID (S) USED:
FLUID WATER FROM 9.5 TO 14.5
FLUID _____ FROM _____ TO _____

TYPE OF BIT _____
CASING SIZE (S) USED: NONE
SIZE _____ FROM _____ TO _____
SIZE _____ FROM _____ TO _____

PIEZOMETER DESCRIPTION

TYPE PVC
DIAMETER OF PERFORATED SECTION 2"
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.010"
TOTAL PERFORATED AREA 5'

RISER PIPE MATERIAL PVC
RISER PIPE DIAMETERS:
O.D. _____ I.D. 2"
LENGTH OF PIPE SECTIONS 10'
JOINING METHOD flush-thread

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5'
PROTECTIVE PIPE O.D. 4"

OTHER PROTECTION Lock

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	~2		769.84	
GROUND SURFACE	0.0		768.27	
BOTTOM OF PROTECTIVE PIPE	—		764.84	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 2.5	TOP 768.27	BOTTOM 765.77
BENTONITE	TOP 2.5	BOTTOM 4	TOP 765.77	BOTTOM 764.27
SAND	TOP 4	BOTTOM 10	TOP 764.27	BOTTOM 758.27
GRAVEL	TOP —	BOTTOM —	TOP —	BOTTOM —
PERFORATED SECTION	TOP 5	BOTTOM 10	TOP 763.27	BOTTOM 758.27
PIEZOMETER TIP	10		758.27	
BOTTOM OF BOREHOLE	14.5		753.77	
GWL AFTER INSTALLATION	5.0		763.27	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☒ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS sackrete runoff apron

WW Engineering & Science, Inc.
Environmental Services Division

Page: 1 of 1
Well/Boring No.: GW-26
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s)	Depth
4 1/4" HSA	0'-30'
3-7/8" Rotary Wash	30'-48.2'

Grouting/Seal

Depth/To	Material/Method
48.1'-30.7'	Sand pack
30.7'-28.1'	Bentonite pellets
28.1-surface	Cement-bent. grout

Development Teflon bailer- 9 gallons

Screen
Manufacturer: Johnson
Material: stainless steel
Model: wire wound
Slot/Gauze: #10 Dia.: 2"
Length: 5'
Depth Set: 39.0' To: 34.0'

Casing

Dia.	Type	Depth Set
4"	blk steel	29.6 To +0.4
2"	SS T-304	34.0 To +2.0'

Date
Started: 3/19/90 Finished: 3/22/90

Elevation
Casing: 699.27'
Ground: 697.27'
Ref. Pt.:

Water Level 29.56' Ft. Below TOC
Measure On: 4-20-90

Location See monitor well location map
10872.6 East, 8831.14 North

Remarks Sample times: A-1540, B-1640, BFB-1620. 4" black steel casing grouted in place from the bottom up through the augers. Lithologic descriptions below 25.5' are based on driling rates and should be used in conjunction with geophysical logs for interpretation.

Thick-ness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION		Sample Depth	6"	12"	18"	OVA	Background	Analysis	
			Blow Counts								
11.0'	11.0'	Silt-clay, trace of sand, moist, brown	(ML-CL)	1-2.5	8	9	14	0	0		A
11.0'	22.0'	Sand and gravel, trace of silt, wet brown	(SP-GP)	3.5'-5.0'	8	18	21	0	0		
3.5'	25.5'	Gravel-clay-silt, trace of sand, brown, moist	(GP-CL)	6.0'-7.5'	7	6	7	0	0		
14.5'	39.5'	Shale		8.5'-10'	8	12	18	0	0		
0.5'	40.0'	Limestone		13.5'-15'	4	8	11	0	0		B,FB
2.5'	42.5'	Shale		18.5'-20'	20	57/1	-	0	0		
0.3'	42.8'	Limetone		23.5'-25'	31	13	15	0	0		
0.2'	43.0'	Shale		30'-30.2'	50/2	-	-				
0.3'	43.3'	Limestone									
0.7'	44.0'	Shale									
0.2'	44.2'	Limestone									
0.3'	44.5'	Shale									
0.4'	44.9'	Limestone									
1.1'	46.0'	Shale									
0.2'	46.2'	Limestone									
1.8'	48.0'	Shale									
0.2'	48.2'	Limestone									
		48.2' bottom of boring									

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Well/Boring No.: GW-27
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s)	Depth
6-1/4" HSA	0'-55'
3-7/8" Rotary Wash	55'-75'

Grouting/Seal

Depth/To	Material/Method
75.1'-58.4'	Sand pack
58.4.'-54.0'	Bentonite pellets
54.0'-surface	Cement-bent. grout

Development Teflon bailer-8 gallons

Screen
Manufacturer: Johnson
Material: stainless steel
Model: wire wound
Slot/Gauze: #10 Dia.: 2"
Length: 5'
Depth Set: 67.5' To: 62.5'

Casing

Dia.	Type	Depth Set		
2"	SS T-304	62.5'	To	+2.5'
4"	blk steel	55'	To	0'

Date
Started: 3/11/90 Finished: 3/14/90

Elevation
Casing: 736.73'
Ground: 734.23'
Ref. Pt.:

Water Level 38.5' Ft. Below surface
Measure On: 3/11/90 while drilling

Location See boring location map
11203.57 East, 8738.05 North

Remarks Sample times: A-0920, B-1040, C-1050, D-1110, E-1405, F-1430, FDP-1440, AB-1500. "Paint" odor in 23.5'-25' sample. Lithologic descriptions below 52.5' are based on drilling rates and should be used in conjunction with geophysical logs for interpretation.

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	OVM	Background	Analysis	
3.5'	3.5'	Sand and gravel, silty, moist, brown	(SP-GP)	1-2.5	30	35	40	0	0		A
11.0'	14.5'	Silt-clay, trace of gravel, moist, brown	(ML-CL)	3.5'-5.0'	6	7	11	0	0		
35.0'	49.5'	Sand, med- coarse, some gravel, moist, brown, wet below 38.5'	(SP)	6.0'-7.5'	10	13	13	0	0		
3.0'	52.5'	Sand, fine, silty, brown, wet		8.5'-10'	13	14	22	0	0		
3.0'	55.5'	Limestone		13.5'-15'	6	12	18	0	0		
0.5'	56.0'	Shale		18.5'-20'	40	45	50	0	0		
1.0'	57.0'	Limestone		23.5'-25'	32	25	37	128	0		B
0.5'	57.5'	Shale		28.5'-30'	8	8	14	71	0		C
1.0'	58.5'	Limetone		33.5'-35'	30	37	45	64	0		D
0.5'	59.0'	Shale		38.5'-40'	13	13	13	80	0		E
0.5'	59.5'	Limestone		43.5'-45'	18	35	50	1	0		F,DP
1.5'	61.0'	Shale		48.5'-50'	35	45	50	0	0		
1.0'	62.0'	Limestone		53.5'-53.9'	100/4	-	-				
0.5'	62.5'	Shale									
3.0'	65.5'	Limestone									
1.0'	66.5'	Shale									
3.5'	70.0'	Limestone									
1.0'	71.0'	Shale									
0.5'	71.5'	Limestone									
3.6'	75.1'	Shale	75.1' Bottom of Boring								

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Page: 1 of 1
Well/Boring No.: GW-28
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s)	Depth
5-1/4" HSA	0'-13'
3-7/8" Rotary Wash	13'-28'

Grouting/Seal

Depth/To	Material/Method
28'-19.3'	Sand pack
19.3'-16.2'	Bentonite pellets
16.2'-1.0'	Cement-bent. grout
1.0'-surface	Concrete

Development Teflon bailer=14 gallons

Screen
Manufacturer: Johnson
Material: stainless steel
Model: wire wound
Slot/Gauze: #10 Dia.: 2"
Length: 5'
Depth Set: 28' To: 23'

Casing

Dia.	Type	Depth Set	
2"	SS	23'	To +1.9'
			To

Date
Started: 2/20/90 Finished: 2/22/90

Elevation
Casing: 688.25'
Ground: 686.35'
Ref. Pt.:

Water Level 15.34' Ft. Below TOC
Measure On: 2-23-90 1100

Location See boring location map
11089.49 East, 8358.57 North

Remarks Hnu above 8.5', OVA below 8.5'. Took core sample from 13'-15.5'. Rotary wash from 13'-28'. "C" sample was taken from 9.0-10.5', consolidated rock descriptions are from drilling rates, not samples, and should be used in conjunction with geophysical logs for interpretations.

Thick-ness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION	Blow Counts	Sample Depth	6"	12"	18"	Hnu/OVA	Background	Analysis
1.0'	1.0'	Silt and sand, black, organic, moist	(OL-OH)	1'-2.5'	14	14	8	0	0	
3.5'	4.5'	Gravel and sand, some cobbles, moist, brown	(GP-GM)	3.5'-5.0'	15	20	16	4	4	A
6.5'	11.0'	Clay, silty, some gravel, moist, gray	(CL-ML)	6.0'-7.5'	8	45	54	3	3	B
0.5'	11.5'	Shale		9'-10.5'	28	24	50	7	7	C
0.5'	12.0'	Limestone		12'-12.8'	35	50/3"	-	3	3	
1.0'	13.0'	Shale								
0.1'	13.1'	Limestone								
1.9'	15.0'	Shale								
3.0'	18.0'	Limestone								
4.0'	22.0'	Shale								
3.0'	25.0'	Limestone								
3.0'	28.0'	Shale								
		28' bottom of boring								

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Page: 1 of 1
Well/Boring No.: GW-29
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s)	Depth
4-1/4" HSA	0'-20'
3-7/8" Rotary Wash	20'-29.5'

Grouting/Seal

Depth/To	Material/Method
28.8'-20.0'	Sand pack
20.0'-17.7'	Bentonite pellets
17.7'-1.0'	Cement-bent. grout
1.0'-surface	Concrete

Development Teflon bailer-12 gallons

Screen
Manufacturer: Johnson
Material: stainless steel
Model: wire wound
Slot/Gauze: #10 Dia.: 2"
Length: 5'
Depth Set: 28' To: 23'

Casing

Dia.	Type	Depth Set
2"	SS	23.8' To +1.8'
		To

Date
Started: 2/27/90 Finished: 2/28/90

Elevation
Casing: 722.11'
Ground: 720.31'
Ref. Pt.:

Water Level 24.3' Ft. Below surface
Measure On: 2-28-90 at 0820

Location See boring location map
10495.75 East, 9211.47 North

Remarks Not enough recovery 3.5'-5.0' for analysis. Consolidated rock descriptions are from drilling rates and should be used in conjunction with geophysical logs for interpretations; moved ahead 5' and went down to 3.5' and collected 3.5'-5.0 sample for analysis.

Thick-ness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	Hnu/OVA	Background	Analysis
6.0'	6.0'	Sand and gravel, silty, moist, brown	(SP-GP)	1'-2.5'	16	24	24	5	5	A
9.0'	15.0'	Shale		3.5'-5.0'	55	-	-	2	2	B
0.5'	15.5'	Limestone		6.0'-7.5'	110	50	40	3	3	
3.5'	19.0'	Shale		8.5'-10'	45	45	50/3	2	2	
0.5'	19.5'	Limestone								
10'	29.5'	Shale								
		29.5' bottom of boring								

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Page: 1 of 1
Well/Boring No.: GW-30
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
6-1/4" HSA 0'-10.8'
3-7/8" Rotary Wash 10.8'-29.8'

Grouting/Seal

Depth/To	Material/Method
29.8'-18.9'	Sand pack
18.9'-16.9'	Bentonite pellets
16.9'-1.0'	Cement-bent. grout
1.0'-surface	Concrete

Development Teflon bailer-6 gallons

Screen
Manufacturer: Johnson
Material: stainless steel
Model: wire wound
Slot/Gauze: #10 Dia.: 2"
Length: 5'
Depth Set: 26' To: 21'

Casing 3-28-90

Dia.	Type	Depth Set
2"	SS	21' To 2.0'
		To

Date
Started: 3/23/90 Finished: 3/25/90

Elevation
Casing: 678.62'
Ground: 676.62'
Ref. Pt.:

Water Level 10.95' Ft. Below TOC
Measure On: 4-20-90

Location See boring location map
10794.44 East, 8337.76 North

Remarks No recovery from 3.5'-5.0' spoon. Lithologic descriptions below 7.5' are from drilling rates and should be used in conjunction with geophysical logs for interpretation.

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION		Sample Depth	Background	OVM	18"	12"	6"
			Blow Counts						
4.0'	4.0'	Sand, med to coarse, some gravel, brown, moist	(SP)	1'-2.5'	18	16	12	0	0
3.5'	7.5'	Silt-clay, trace of gravel, gray-green, moist	(ML-CL)	3.5'-5'	18	14	16	-	0
3.0'	10.5'	Shale, weathered		6'-7.5'	26	22	30	0	0
0.3'	10.8'	Limestone		8.5'-10.0'	15	22	25	0	0
2.2'	13'	Shale							
0.3'	13.3'	Limestone							
1.5'	14.8'	Shale							
0.4'	15.2'	Limestone							
1.8'	17.0'	Shale							
0.6'	17.6'	Limestone							
0.4'	18.0'	Shale							
0.3'	18.3'	Limestone							
2.7'	21.0'	Shale							
0.2'	21.2'	Limestone							
4.3'	25.5'	Shale							
0.3'	25.8'	Limestone							
3.2'	29.0'	Shale							
0.6'	29.6'	Limestone							
0.2'	29.8'	Shale							
		29.8' bottom of boring							

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: GW-31
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-57
Crew Chief: Roger Groves
Supervisor: M. Potter

Drilling Method(s)	Depth
4-1/4" HSA	0'-17'

Grouting/Seal

Depth/To	Material/Method
16.8'-8.0'	Sand pack
8.0'-4.0'	Bentonite Pellets
4.0'-1.0'	Bent. Cuttings Mix
1.0'-surface	Surface Concrete

Development Teflon bailer-13 gallons

Screen
Manufacturer: Johnson
Material: stainless steel
Model: wire wound
Slot/Gauze: .010 Dia.: 2"
Length: 5'
Depth Set: 16.8' To: 11.8'

Casing

Dia.	Type	Depth Set		
2"	SS	11.8'	To	+1.8'
			To	

Date
Started: 3/25/90 Finished: 3/26/90

Elevation
Casing: 677.59'
Ground: 675.79'
Ref. Pt.:

Water Level 11.68' Ft. Below TOC
Measure On: 4-20-90

Location See boring location map.
10789.49 East, 8336.19 North

Remarks Screen interval chosen from GW-30 information.

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION	Blow Counts	Background	OVM	18"	12"	6"	Sample Depth
		See GW-30 Boring Log for lithologic descriptions.							
		17' Bottom of Boring							

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Page: 1 of 1
Well/Boring No.: GW-32
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: E. Culver

Drilling Method(s)	Depth
6-1/4" HSA	0'-29.5'
3-7/8" Rotary Wash	29.5'-49.5'

Grouting/Seal

Depth/To	Material/Method
49.5'-35.0'	Sand Pack
35.0'-33.7'	Hole Plug
33.7'-1.0'	Cement-Bent. Grout
1.0-surface	

Development Teflon bailer-34 gallons

Screen
Manufacturer: Johnson
Material: Stainless Steel
Model: Wire Wound
Slot/Gauze: .010 Dia.: 2"
Length: 5'
Depth Set: 44.1' To: 39.1'

Casing 3-28-90

Dia.	Type	Depth Set		
2"	SS	39.1	To	+1.9'
4"	Blk. Stl.	29.5	To	0.5'

Date
Started: 4/4/90 Finished: 4/7/90

Elevation
Casing: 673.02'
Ground: 671.12'
Ref. Pt.:

Water Level 5.58' Ft. Below TOC
Measure On: 4-20-90

Location See monitor well location map.
9990.89 East, 8779.22 North

Remarks 6 1/4" HSA were advanced to 29.5' to find more competent bedrock.

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	OVM	Background
0.5	0.5	Silt-Clay soil, trace sand, moist, brown	(ml-cl)	1.0'-2.5'	3	7	9	0	
3.5	4.0	Clay, silty, brown, moist	(cl)	3.5'-5.0'	7	6	5	0	
0.5	4.5	Clay, mottled, brown, moist	(cl)	6.0'-7.5'	5	3	4	0	
2.5	7.0	Clay, mottled brn w/thin lenses of fine to very fine sand, wet	(cl-sc)	8.5'-10'	6	4	7	0	
4.5	11.5	Sand-med-crse, gravelly, clayey, wet	(sp-sc)	11'-11.6'	12	50/2"	-	0	
0.5	12.0	Clay-sandy, gravelly, silty, mottled brown-gray, moist	(cl)	13.5'-14'	100	-	-	0	
14.5	26.5	Clay-silty with fine to coarse rounded gravel (ls clasts), gray, tr.		18.5'-19.5'	54	18	-	0	
		weathered shale fragments, very dense, dry-sl. moist	(cl)	23.5'-24.5'	58	50/4"	-	0	
4.5	31.0	Shale		28'-28.5'	100/5"	-	-	0	
1.0	32.0	Limestone							
6.5	38.5	Shale							
1.0	39.5	Limestone							
2.0	41.5	Shale							
0.2	41.7	Limestone							
1.3	43.0	Shale							
0.1	43.1	Limestone							
5.4	48.5	Shale							
1.0	49.5	Limestone							
		49.5' Bottom of Boring							

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: GW-33
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: G. Havlichek

Drilling Method(s)	Depth
4-1/4" HSA	0'-12.8'

Grouting/Seal

Depth/To	Material/Method
12.8'-5.8'	Sand Pack-2 bags
5.8'-1.0'	Bentonite Plug-1 Pail

Development Teflon bailer-19 gallons

Screen
Manufacturer: Johnson
Material: Stainless Steel
Model: Wire Wound
Slot/Gauze: .010 Dia.: 2"
Length: 5'
Depth Set: 12.8 To: 7.8'

Casing 3-28-90

Dia.	Type	Depth Set		
2"	SS	7.8'	To	+2.2'
			To	

Date
Started: 4/6/90 Finished: 4/6/90

Elevation
Casing: 672.74'
Ground: 670.54'
Ref. Pt.:

Water Level 4.83' Ft. Below TOC
Measure On: 4-20-90

Location See monitor well location map.
9983.35 East, 8765.47 North

Remarks GW 33 approx. 15.0' south of GW 32

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION	Blow Counts: Background	OVM	18"	12"	6"	Sample Depth
		See GW 33 well boring log sheet for						
		lithologic descriptions.						
		EOB 12.8'						

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: GW-35
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s)	Depth
4-1/4" HSA	0'-32.5'
3-7/8" Rotary Wash	32.5'-53.8'

Grouting/Seal

Depth/To	Material/Method
41.9-35.7	Sand Pack
35.7-33.5	Bentonite Pellets
33.5-1.0	Cement-Bent. Grout
1.0-surface	Concrete

Development Teflon bailer-25 gallons

Screen
Manufacturer: Johnson
Material: Stainless Steel
Model: Wire Wound
Slot/Gauze: .010 Dia.: 2"
Length: 5'
Depth Set: 41.9 To: 36.9'

Casing 3-28-90

Dia.	Type	Depth Set		
4"	Black Steel	34'	To	+1.3'
2"	S.S.	36.9'	To	+2.1'

Date
Started: 3/26/90 Finished: 4/3/90

Elevation
Casing: 671.98'
Ground: 669.88'
Ref. Pt.:

Water Level 4.45' Ft. Below TOC
Measure On: 4-20-90

Location See monitor well location map.
9849.08 East, 8851.21 North

Remarks 6" of perched water above 3.5'.

A-1455 D-1555
B-1500 E-1700
C-1510

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	OVM	Background	Analysis	
3.0	3.0	Silt, sandy, moist, dk. brown, organic	(ML-OH)	1'-2.5'	4	5	7	0	0		A
8.5	11.5	Silt-clay, some gravel, brown-gray mottled, moist	(ML-CL)	3.5'-5'	10	10	18	0	0		B
20.5	32	Clay, some rounded gravel, gray, green, moist	(CL)	6'-7.5'	16	22	30	0	0		C
2.5	34.5	Shale		8.5'-10'	16	18	22	0	0		
1.5	36	Limestone		13.5'-15'	16	23	30	0	0		D
16	52	Shale		18.5'-20'	15	20	23	0	0		
1.7	53.7	Limestone		23.5'-25'	23	26	30	0	0		
				28.5'-29.3'	23	66/4"	-	0	0		E
		53.7' Bottom of Boring									

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Page: 1 of 1
Well/Boring No.: GW-36
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: W. Davidson

Drilling Method(s) **Depth**
4-1/4" HSA 0'-26.1'

Grouting/Seal

Depth/To	Material/Method
26'-14'	Cave-in/Bentonite
14'-6.6'	Sand-Pack
6.6'-5.3'	Hole Plug
5.3'-1.0'	Cement-Bent. Grout
1.0'-surface	Concrete

Development Teflon bailer-8 gallons

Screen
Manufacturer: Johnson
Material: Stainless Steel
Model: Wire Wound
Slot/Gauze: .010 Dia.: 2"
Length: 5'
Depth Set: 13' To: 8'

Casing

Dia.	Type	Depth Set	
2"	S.S.	8'	To +2'
			To

Date
Started: 4/3/90 Finished: 4/3/90

Elevation
Casing: 671.84'
Ground: 669.84'
Ref. Pt.:

Water Level 4.84' Ft. Below TOC
Measure On: 4-20-90

Location See monitor well location map.
9845.14 LEast, 8846.44 North

Remarks Drilled to 26 feet to investigate a negative gamma response from geophysical log of GW 35-the response was apparently a transition from silty clay to silty clay with weathered shale. The boring was backfilled with bentonite/cuttings mixture to 14' below grade.

Thick-ness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION	Blow Counts / OVM / 18" / 12" / 6" / Sample Depth
4.0	4.0	Silt, sandy, moist, dk. brown	8.5'-10'
4.0	8.0	Clay, silty, barely moist, brown, w/fine-med. gravel	26'-26.1'
3.0	11.0	Clay, silt, brown, moist-wet, w/fine-coarse gravel (cs clasts) to	
		cobbles, some fine-med sand	
15.0	26.0	Clay, silty, gray, slightly moist, some fine to med. rounded gravel	
		Clay, silty, dry, trace fine gravel, some weathered shale	
		26.1' Bottom of Boring	

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: GW-38
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: B-53, B-57
Crew Chief: B.C. Manos, R. Groves
Supervisor: M. Potter

Drilling Method(s)	Depth
6-1/4" HSA	0'-38.5'
3-7/8" Rotary Wash	38.5'-60'

Grouting/Seal

Depth/To	Material/Method
60'-39.4'	Sand-Pack
39.4'-36.3'	Bentonite Pellets
36.3'-0.5'	Cement-Bent. Grout
0.5'-surface	Concrete

Development Teflon bailer-40 gallons

Screen
Manufacturer: Johnson
Material: Stainless Steel
Model: Wire Wound
Slot/Gauze: .010 Dia.: 2"
Length: 5'
Depth Set: 48' To: 43'

Casing

Dia.	Type	Depth Set
4"	Blk. Steel	0 To 40'
2"	S.S.	43 To 0'

Date
Started: 3/5/90 Finished: 3/10/90

Elevation
Casing: 684.50'
Ground: 684.50'
Ref. Pt.:

Water Level 15.75' Ft. Below TOC
Measure On: 4-20-90

Location See boring location diagram
10877.43 East, 8491.11 North

Remarks Not enough recovery from 18.5' - 19.0' sample for analysis. Grout ran out 7' from surface while grouting 4" black steel casing. We left it open and will grout it up when we finish. The Well consolidated rock desc. are interpreted from drilling rates and should be used in conjunction with geophysical logs for proper identification. The lithologic descriptions below 37.5' are not from actual samples and may be erroneous. We used 2000 gals. of water while rotary washing this well.

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	OVM	Background	Analysis
1.0	1.0	Sand & Gravel, silty, moist, brown	(sp-gp)	1-2.5	10	18	18	2	2	A
2.0	3.0	Silt-clay, tr. sand, moist, black-brown	(ml-cl)	3.5-5	10	8	10	100	2	B
1.5	4.5	Sand & Gravel, wet, brown	(sp-gp)	6-7.5	10	25	50	30	2	C
2.0	6.5	Silt-clay, trace sand, moist, brown	(ml-cl)	8.5-10	18	25	25	2	2	
10.5	17.0	Sand & Gravel, silty, wet, brown	(sp-gp)	13.5-15	10	24	37	10	2	D
4.0	21.0	Silt, some fine sand, wet, brown,	(ml)	18.5-19	100/5	-	-	15	2	
16.5	37.5	Clay, trace gravel, moist, gray, gravel is rounded	(cl)	23.5-25	22	28	40	2	2	
1.0	38.5	Limestone		28.5-29.7	12	30	60/2	5	5	
1.5	41.0	Shale		33.5-35	40	50	50/3	5	5	
2.0	43.0	Limestone								
2.0	45.0	Shale								
1.0	46.0	Limestone								
2.0	48.0	Shale								
5.0	53.0	Limestone								
0.5	53.5	Shale								
4.5	58.0	Limestone								
2.0	60.0	Shale								
		60' bottom of boring								

Hand Auger Borings (HA)

WW Engineering & Science, Inc.
Environmental Services Division

Page: 1 of 1
Well/Boring No.: HA01
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor WW Eng. & Science
Address: 5555 Glenwood Hills Pkwy
Grand Rapids, MI
Equipment: Stainless Steel Hand Auger
Crew Chief:
Supervisor: W. Davidson/E. Culver

Drilling Method(s) **Depth**
Hand Auger 2" O.D. 0'-2.0'

Grouting/Seal
Depth/To Material/Method
2'-0' Natural soils

Development N/A

Screen
Manufacturer:
Material:
Model: N/A
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 4/5/90 Finished: 4/5/90

Elevation
Casing:
Ground: 749.0'
Ref. Pt.:

Water Level 2.0 Ft. Below Ground
Measure On: 4/5/90

Location See boring location map. 11185.29 East, 9402.08 North

Remarks Samples dumped from auger onto clean plastic and immediately placed in sample bottles with stainless steel spatula. Samples collected for analysis from 6-12 inches and 18-24 inches below ground level, with a duplicate sample from 18-24 inches.

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION	Blow Counts / Sample Depth	6"	12"	18"	OVM	Background	Analysis
0.5'	0.5'	Topsoil - dark brown to black, loamy, some glass and metal trash							
0.7'	1.2'	Clay - brown to dirty brown, some root structures, moist							
0.8'	2.0'	Clay - brown, sandy to silty, moist - wet at bottom of boring							
		End of Boring - 2'							

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: HA02
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor WW Eng. & Science
Address: 5555 Glenwood Hills Pkwy
Grand Rapids, MI
Equipment: Stainless Steel Hand Auger
Crew Chief:
Supervisor: E. Culver/K. Osterman

Drilling Method(s) **Depth**
Hand Auger 2" O.D. 0'-2.0'

Grouting/Seal
Depth/To Material/Method
2'-0' Natural soils

Development N/A

Screen
Manufacturer:
Material:
Model: N/A
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 4/5/90 Finished: 4/5/90

Elevation
Casing:
Ground: 749.4'
Ref. Pt.:

Water Level 1.3 Ft. Below Ground
Measure On: 4/5/90

Location See boring location map. 11271.09 East, 9396.12 North

Remarks Samples dumped from auger onto clean plastic and immediately placed in sample bottles with stainless steel spatula. Samples collected for analysis from 6-12 inches and 18-24 inches below ground level.

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION	Blow Counts / Sample Depth	6"	12"	18"	OVM	Background	Analysis
0.2'	0.2'	Topsoil, some trash (glass and metal debris) black, loamy soil							
0.8	1.0'	Clay, brown, mottled sandy to silty, trace trash debris, moist							
1.0'	2.0'	Clay, greenish gray, mottled, trace sand and silt							
		End of Boring - 2'							

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: HA03
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor WW Eng. & Science
Address: 5555 Glenwood Hills Pkwy
Grand Rapids, MI
Equipment: Stainless Steel Hand Auger
Crew Chief:
Supervisor: E. Culver/K. Osterman

Drilling Method(s) **Depth**
Hand Auger 2" O.D. 0'-2.0'

Grouting/Seal
Depth/To Material/Method
2'-0' Natural soils

Development N/A

Screen
Manufacturer:
Material:
Model: N/A
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 4/5/90 Finished: 4/5/90

Elevation
Casing:
Ground: 749.1'
Ref. Pt.:

Water Level 1.3 Ft. Below Ground
Measure On: 4/5/90

Location See boring location map.
11355.38 East, 9401.15 North

Remarks Samples dumped from auger onto clean plastic and immediately placed in sample bottles with stainless steel spatula. Samples collected for analysis from 6-12 inches and 18-24 inches below ground level. Field blank in the form of silica sand poured through auger head and over spatula collected in conjunction with 18-24 inch sample.

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION	Blow Counts / Sample Depth	6"	12"	18"	QVM	Background	Analysis
0.3'	0.3'	Topsoil - brown to black, loamy, with trash debris							
1.7	2.0'	Clay - brown to gray, silty to sandy, moist							
		End of Boring - 2'							

Waste Lagoon Borings (WL)

WW Engineering & Science, Inc.
Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-01
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 1121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-27.8'

Grouting/Seal

Depth/To	Material/Method
22.8' - 4'	Cave-in
4'-surface	Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 4/23/90 Finished: 4/23/90

Elevation
Casing:
Ground: 753.9'
Ref. Pt.:

Water Level 18' Ft. Below surface
Measure On:

Location See waste lagoon boring location map. 11131.07 East, 9010.45 North

Remarks Too little recovery for analysis on samples 14.5'-16.5', A-1100
16.5'-17.5', 17.5'-19.5', 16.5'-17.5' drilled very hard-maybe a piece B-1130
of concrete.

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
17.5'	17.5'	Debris mixed with soil		14.5'-16.5'	7	7	5	5	3	3
3.0'	20.5'	Clay, gravelly, sandy, moist, brown, wet @ 18'		16.5'-17.5'	8	50/3"	-	-	100	3
7.3'	27.8'	Clay and sand and gravel, moist, brown, gray @ 26'		17.5'-19.5'	12	11	26	23	05	3
			A	19.5'-21.5'	7	29	11	19	100	3
		-27.8' Bottom of Boring-	B	21.5'-23.5'	11	11	18	24	02	4
			B	23.5-25.5'	11	12	18	24	02	4
				25.5'-27.5'	10	28	60/3"	-	10	4

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-02
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 1121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s)	Depth
4 1/4" HSA	0'-27.5'

Grouting/Seal

Depth/To	Material/Method
27.5' - 2.0'	Cave-in
2.0' - surface	Hole Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 5/01/90 Finished: 5/01/90

Elevation
Casing:
Ground: 749.8'
Ref. Pt.:

Water Level 21' Ft. Below surface
Measure On: while drilling

Location See waste lagoon boring location map. 11173.19 East, 9064.52 North

Remarks Cuttings from 5'-13.5' had a peak OVA reading of 100 ppm. No recovery from 17.5'-19.5' spoon. OVA background started drifting between 20-30 PPM so we switched to the HNU at 23.5' - 25.5' sample.

A - 15.5'-17.5' - 1520
B - 21.5'-23.5' - 1550

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
15.5'	15.0'	Soil and debris, alot of wood, some plastic, metal	13.5'-15.5'	9	11	38	16	1%	8
10.0'	25.0'	Clay, silty, trace of sand and gravel, gray-green, brown from 17'-19',	15.5'-17.5'	5	6	7	7	2%	8
		more gravel and silt 21.5'-25'	17.5'-19.5'	9	7	9	14	-	8
2.5'	27.5'	Clay, trace of gravel, fine-medium, gray, very hard, gravel is rounded	19.5'-21.5'	6	12	13	22	.3%	8
			21.5'-23.5'	11	12	14	11	1%.	8
		27.5' Bottom of Boring	23.5-25.5'	11	15	19	25	1%	20
			25.5'-27.5'	62	38	68	125	8	1

WW Engineering & Science, Inc.
Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-03
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 1121 Canal St. Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-32.5'

Grouting/Seal

Depth/To	Material/Method
32.5' - 5'	Cave-in
5'-surface	Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Remarks Fluid from above 15' is greenish -brown. No recovery from 25'-27' spoon.

Date
Started: 4/24/90 Finished: 4/24/90

Elevation
Casing:
Ground: 750.8'
Ref. Pt.:

Water Level Ft. Below
Measure On: Some water above 15' where sampling began

Location See waste lagoon boring location map.11232.67 East, 9009.11 North

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background	
15.0'	15'	Soil and debris mixed	15-17	3	3	20	20	1%	2	
6'	21'	Clay, sandy, moist, brown to 21', blue-gray below.	A 17-19	40	95	30	20	.03%	2	
7'	28'	Clay, trace of gravel, moist, gray 2"-3" sand lens @ 24'	B 19-21	9	9	10	12	.03%	2	
4'	31.5'	Sand and gravel, gray, very moist	C 21-23	20	20	15	20	.3%	2	
1.0'	32.5'	Clay, trace of gravel, moist, gray	23-25	18	15	19	15	.3%	2	
			25-27	20	25	30	35	-	-	
		32.5' Bottom of Boring	D 27-29	18	15	14	15	.01%	2	
			E 29-31	30	55	45	60	.05%	3	
			31-33	31	150	75	32/11	10	3	

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-04
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 1121 Canal St. Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-28'

Grouting/Seal
Depth/To Material/Method
28'-2' Cave-in
2'-surface Hole- Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 5/06/90 Finished: 5/06/90

Elevation
Casing:
Ground: 747.3'
Ref. Pt.:

Water Level Ft. Below
Measure On: Wet above 13.5' where sampling began

Location See waste lagoon boring location map. 11300.84 East, 9038.05 North

Remarks 18% LEL in cuttings outside augers 10'-13.5'. 15.5'-17.5' spoon ~1' recovery, 4" cinders, OVA-.25%, 7" clay is probably cave-in - OVA 300 ppm. 19.5-21.5 - 3" recovery, may be unreliable sample. 23.5'-26.1' sample is a piece of concrete - no readings.

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
12.5'	12.5'	Brick, wood, and metal debris mixed with black organic soil	A	13.5'-15.5'	5	4	12	12	.1%	8
2.5'	15.0'	Clay, trace of gravel, brick, green-gray, moist, trace of glass		15.5'-17.5'	4	20	14	14	.25%	15
1.5'	16.5'	Cinders, glass, black, wet	B	17.5'-19.5'	6	8	11	11	.15%	10
5.0'	21.5'	Clay, silty, red-brown, trace of fine gravel, very firm, slightly moist		19.5'-21.5'	8	7	9	9	100	10
6.5'	28.0'	Clay, silty, mottled, brown-gray, trace of fine-coarse gravel (LS frags.)	C	21.5'-23.5'	40	45	40	50	100	10
				23.5-25.5'	65	50	-	-	-	-
		28' Bottom of Boring		25.5'-27.5'	50	75	50	-	30	10

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-05
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 1121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-45'

Grouting/Seal
Depth/To Material/Method
45'-2' Cave-in
2'-surface Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 5/14/90 Finished: 5/14/90

Elevation
Casing:
Ground: 757.3'
Ref. Pt.:

Water Level 27' Ft. Below surface
Measure On: While drilling

Location See waste lagoon boring location map, 11119.26 East, 8949.05 North

Remarks Too little recovery for analysis - 19'-21', 21'-23', 25'-27'. Switched to OVA below 32.5'; Head space OVA test on samples A & B gave 10,000+ ppm readings. Very hard drilling 32'-36'.

A - 1330
AB - 1300
B - 1430
C - 1620

Thickness (feet)	Depth to Base (feet)	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
24'	24'	Debris mixed with clayey soil, plastic, brick, etc.		19'-21'	50	15	12	12	81	0
1.0'	25'	Clay, trace of silt, moist, brown		21'-23'	13	16	12	11	171	0
2.0'	27'	Clay, trace of gravel, sand, mottled, brown-black, moist	A	23'-25'	12	8	12	13	375	0
5'	32'	Sand, med. coarse, some silt, trace of gravel, wet, brown-black, oily		25'-27'	8	8	10	15	683	0
4'	36'	Silt and gravel, some cobbles, brown, trace of sand, moist	B	27'-29'	20	14	11	16	620	0
6'	42'	Sand and gravel, wet, brown, some cobbles, silty		29'-31'	12	36	26	22	703	0
3'	45'	Clay, trace of gravel, gray, moist, gravel is rounded.		31'-'32'	53	80	77/3"	-	188	0
				35'-35.7'	160	60/2"	-	-	15%	12
				37'-38.5'	75	72	170	-	.03	11
		45' Bottom of Boring	C	43'-45'	5	7	9	15	12	12

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-06
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 1121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: W. Davidson, E. Culver

Drilling Method(s)	Depth
4 1/4" HSA	0'-28.5'

Grouting/Seal

Depth/To	Material/Method
32'-25'	Bentonite pellets
25'-0'	Auger cuttings

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 4/9/90 Finished: 4/11/90

Elevation
Casing:
Ground: 753.4'
Ref. Pt.:

Water Level 21' ± Ft. Below surface
Measure On: 4/11/90 After hole had sat since 4/9/90. (through augers)

Location See waste lagoon boring location map. 11175.71 East, 8960 North

Remarks A - incomplete sample
B - 24'-28'
C - 27.5'-32.0'

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
1.5'	1.5'	Clay, brown, sandy, some debris	5'-7'	-	-	-	-	17	0
4.5'	6.0'	Trash and soils, black, moderately firm, no apparent voids	13'-14.5'	5	5	5	-	21	0
11.0'	17.0'	Trash, wood debris, black	18.5'-20'	5	5	5	-	3850	0
7.0'	24.0'	Organic clays, silts, black, wood debris, some trash, moist	20'-22'	3	3	4	-	38	0
5.0'	29.0'	Clay, brown, very sandy, gravelly	22'-24'	-	-	-	-	30	0
3.0+'	32.0'	Clay, greenish-gray, sandy, gravelly, moist layers of coarse sand to fine	24'-26'	17	17	21	28	4000	0
		gravel, wet, (Clays 20 PPM) (Gravels 200 PPM)	26'-28'	22	22	27	30	1266	0
		32' Bottom of Boring							

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-07
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 1121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-35'

Grouting/Seal

Depth/To	Material/Method
35'-15'	Cave-in
15'-Surface'	Hole-plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 4/17/90 Finished: 4/18/90

Elevation
Casing:
Ground: 751.4'
Ref. Pt.:

Water Level 21' Ft. Below surface
Measure On:

Location See waste lagoon boring location map. 11223.43 East, 8961.64 North

Remarks Fluid above 22' is red and green, below is turquoise blue. No recovery from 29'-31'.

4/17/90 A-1300
~~4/17/90 B-1400~~
~~4/18/90 C-1000~~
~~4/18/90 D-1030~~
4/18/90 E-1200

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION		Sample Depth	Background	OVA	24"	18"	12"	6"
15'	15'	Debris mixed with soil		15'-17'	18	12	11	10	1	0
7.0'	22'	Silt and sand, plastic, wire, moist, brown.		17'-19'	11	8	8	8	27	0
9'	31'	Silt-clay, sandy, some gravel, turquoise blue fluid @ 22-23' is sticky with	A	19'-21'	13	11	10	9	6580	0
		a consistency of glue	B	21'-23'	12	28	10	11	10000+	0
3.5'	34.5'	Sand, med-coarse, some gravel, wet		23'-25'	11	9	10	11	10000+	0
0.5'	35.0'	Clay, gravelly, sandy, moist, gray-green	C	25'-27'	15	15	28	30	10000+	0
			D	27'-29'	53	30	27	26	10000+	0
		-35.0 Bottom of Boring-		29'-31'	10	13	23	27	10000+	0
			E	31'-33'	3	7	9	10	2071	0
				33'-35'	12	21	23	30	3871	0

WW Engineering & Science, Inc.
Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-08
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-31.2'

Grouting/Seal

Depth/To	Material/Method
31.2'-1.0'	Cave-in
1.0'-Surface'	Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 4/30/90 Finished: 5/1/90

Elevation
Casing:
Ground: 749.3'
Ref. Pt.:

Water Level 19' Ft. Below surface
Measure On: While drilling

Location See waste lagoon boring location map. 11275.20 East, 8960.16 North

Remarks Cuttings from 0'-15' had peak OVA readings of 1000 PPM. A-IFB-0850
@ 21' OVA read. 35% coming out of augers, breathing zone A-0930
was background. Too little recovery from 13.5'-13.6', AB-0855
15'-16', 19'-21',21'-23', spoons for analysis. B-1020/B-DP-1020

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
17'	17'	Silt-sand, debris, black-organic 6-8', wood, metal	13.5'-13.0'	02/.1"	-	-	-	5	5
7.0'	24'	Silt-clay, trace sand-fine, trace gravel-fine, wet @ 19'	15'-16'	6	60	-	-	1%	5
0.8'	24.8'	Sand and silt and gravel, brown, moist	17'-19'	9	9	16	20	.1%	10
6.4'	31.2'	Clay-silt, gray, moist, trace gravel fine-med. rounded, occ. cobble	19'-21'	15	11	15	20	300	10
			21'-23'	26	30	32	32	50	8
		31.2' Bottom of Boring-	23'-25'	18	16	23	40	.1%	5
			25'-27'	35	50/.1"	-	-	-	-
			27.5'-29'	70	67	170	-	.1%	5
			29'-30'	67	74	-	-	02%	5
			30'-31.2'	24	75	60/2"	-	5	5

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Page: 1 of 1
Well/Boring No.: WL-09
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-45.7'

Grouting/Seal

Depth/To	Material/Method
45'-2'	Cave-in
2'-0'	Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 5/15/90 Finished: 5/15/90

Elevation
Casing:
Ground: 760.8'
Ref. Pt.:

Water Level Ft. Below
Measure On: None encountered

Location See waste lagoon boring location map. 11120.94 East, 8891.43 North

Remarks No recovery 4.3-44.25' spoon. Hit something very hard at 45.7' that we could not drill through.

A-1100
A-IFB-0850
IAB-0850
B-1145

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background	
14.5'	14.5'	Debris mixed with soil		23'-25'	12	10	10	6	1%		7
10.5'	24.5'	Wood debris, rubber, paper, clayey soil	A	25'-27'	20	50	38	14	1%		7
1.0'	25.5'	Tar-like sand & gravel, black, sticky (OVA - 1%+)		27'-29'	25	25	100	50	.3%		7
6.5'	32.0'	Silt-clay, come gravel, trace sand, brown, moist (OVA - .3%)		29'-31'	38	45	28	24	.1%		7
7.5'	39.5'	Clay, silty, dark brown-black, moist (OVA - 1%)	B	31'-33'	12	17	10	9	1%		7
6.2'	45.7'	Clay, sandy, silty, some gravel, gray-green, moist		33'-35'	14	22	11	14	.03%		7
				39'-41'	11	45	50	20	.3%		5
		45.7' Bottom of Boring		43'-44.25'	50	60	70/.3"	-	.3%		6
				45'-45.7'	90	60/.2"	-	-	.03%		6

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-10
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4 "HSA 0'-34'

Grouting/Seal

Depth/To	Material/Method
34'-1.5'	Cave-in
1.5'-surface	Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 4/20/90 Finished: 4/20/90

Elevation
Casing:
Ground: 756.0'
Ref. Pt.:

Water Level 22' Ft. Below surface
Measure On: while drilling

Location See waste lagoon boring location map. 11177.78 East, 8908.94 North

Remarks Too little recovery from spoons 18-20, 28-30' for analysis. Sample A was taken from the 22'-26' interval. 26'-28' spoon had very little soil, wood, rubber, cloth

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	24"	Hnu/OVA	Background
18'	18'	Debris mixed with soil		18'-20'	6	9	6	8	300	3
8.0'	26.0'	Silt and sand, black-brown, moist mud, plastic, brick cloth		20'-22'	7	15	40	12	.3%	9
		Raspberry colored liquid at 22'	A	22'-24'	7	30	7	7	.03%	7
8.0'	34.0'	Clay, sand, brown, moist, turns gray at 30.5'; trace of	A	24'-26'	16	13	15	11	.2%	8
		gravel-rounded, some sand 33'-34'		26'-28'	30	20	18	18	1%	3
				28'-30'	15	15	16	18	.03%	3
			B	30'-32'	5	6	10	18	50	3
		34' Bottom of Boring	B-DP	32'-34'	12	25	50	38	50	3

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-11
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-32'

Grouting/Seal

Depth/To	Material/Method
32'-1.5'	Cave-in
1.5'-surface	Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 4/22/90 Finished: 4/22/90

Elevation
Casing:
Ground: 753.3'
Ref. Pt.:

Water Level Ft. Below
Measure On: none encountered

Location See waste lagoon boring location map. 11224.15 East, 8913.86 North

Remarks

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
18'	18'	Debris and soil mix, moist	18'-20'	9	8	12	12	.02%	3
4'	22'	Silt and sand, moist, brown, some plastic, wire, brick, etc.	20'-22'	5	6	6	6	.4%	3
10'	33'	Clay, trace - some sand and gravel, brown, moist, gravel,	22'-24'	6	10	10	11	.2%	3
		becomes more rounded below 28'	24'-26'	10	12	20	12	.04%	3
			26'-28'	8	20	29	20	.75	3
			28'-30'	14	25	14	16	.25	3
		32' Bottom of Boring	30'-32'	26	16	27	40	.3	3

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-12
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s)	Depth
4 1/4" HSA	0'-34.5'

Grouting/Seal

Depth/To	Material/Method
34.5'-2'	Cave-in
2'-surface	Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 5/8/90 Finished: 5/8/90

Elevation
Casing:
Ground: 750.5'
Ref. Pt.:

Water Level Ft. Below
Measure On: none encountered

Location See waste lagoon boring location map. 11260.70 East, 8916.74 North

Remarks 15'-15.5' spoon was empty, 17'-19' and 21'-23' - too little recovery for analysis

A - 100
A-FB - 0900
AB - 0940
B - 1100
C - 1115

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
17'	17'	Debris mixed with clayey soil, moist, brown		13'-15'	7	8	25	7	5	5
9'	26'	Clay, trace of gravel, brown, moist, gray-green below 23'		15'-15.5'	4	Bounce			-	-
0.5'	26.5'	Sand and gravel, silty, brown, moist (OVA-500 ppm)	A-AFB	17'-19'	4	12	14	20	10	5
0.5'	27.0'	Clay, silty, trace of gravel, gray, moist (OVA-100 ppm)		19'-21'	6	8	10	10	.05%	5
7.0'	34.0'	Sand, fine to medium, trace of gravel, brown, moist (OVA-100		21'-23'	12	9	10	14	1%	5
		ppm - 33'-34')	B	23'-25'	14	24	33	41	50	5
0.5'	34.5'	Clay, trace of gravel, moist, brown (OVA-30 ppm)		25'-27'	18	50	32	26	.05%	5
			C	27'-29'	21	23	35	24	1%	7
				29'-31'	25	32	55	50/5"	27	7
		34.5' Bottom of Boring		33'-34.5'	45	59	91	-	100	7

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-13
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-40'

Grouting/Seal
Depth/To Material/Method
40'-0' Cement-bent.-grout

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 5/18/90 Finished: 5/18/90

Elevation
Casing:
Ground: 729.6'
Ref. Pt.:

Water Level 8' Ft. Below surface
Measure On: while drilling

Location See waste lagoon boring location map. 11045.65 East, 8733.52 North

Remarks Unsuccessful recovery 18'-20', 28'-30', 23'-25'.
Switched from OVA to Hnu @ 28'-30' sample,
OVA background is drifting

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	24"	OVA/Hnu	Background
.25'	.25'	Topsoil	3'-5'	10	12	9	8	10	10
13.5'	14'	Silt and sand and gravel, brown, moist (wet below 8'), more	8'-10'	20	60	30	30	10	10
		gravel (50%) 8'-10' spoon	13'-15'	25	25	30	20	10	10
2.0'	16'	Silt-clay, some sand, trace of gravel, brown, moist, loose	18'-20'	12	14	18	20	-	10
9.0'	25'	Silt and sand and gravel, brown, wet, loose	23'-25'	20	14	15	16	.02%	19
2.0'	27'	Silt and gravel and cobbles, gray, very moist	28'-30'	55	27	25	22	25	2
1.5'	28.5'	Clay, trace of gravel, moist, gray	33'-35'	40	66	31	42	2	2
2.5'	31.0'	Sand, some cobbles, brown, moist	38'-40'	35	35	40	40	2	2
5.0'	36.0'	Silt-clay, trace of gravel, trace of sand, very moist, gray							
4.0'	40.0'	Sand, fine to med., wet, gray							
		40' Bottom of Boring							

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-14
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-59'

Grouting/Seal

Depth/To	Material/Method
59'-2'	Cave-in
2'-surface	Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 5/6/90 Finished: 5/7/90

Elevation
Casing:
Ground: 762.3'
Ref. Pt.:

Water Level 25' Ft. Below surface
Measure On: while drilling 5-6-90

Location See waste lagoon boring location map. 11175.87 East, 8835.67 North

Remarks Too little recovery 25'-27', 33'-35', 37'-39'. 31'-33' sample pegged OVA immediately. Oil in sand is dark black and becomes sticky like tar below 43'. While augering from 47'-53' fumes coming out of the augers. A-1645 B-1700

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
25.0'	25.0'	Debris (wood, insulation, metal) mixed with soil	23'-25'	15	11	5	5	8	8
27.5'	52.5'	sand, fine-coarse, trace of silt, gravel, wet, brown-black, oily, small	25'-27'	4	5	7	5	1%	8
		2"-3" clay lenses below 41', some gravel below 43'	27'-29'	3	3	3	3	.5%	8
6.5'	59.0'	Clay, trace of gravel, moist, brown, gray-green below 54.5'	29'-31'	12	15	9	6	.2%	8
			31'-33'	3	3	4	8	1%+	8
			33'-35'	5	8	7	8	1%	8
		59' Bottom of Boring	35'-37'	30	4	8	10	1%	8
			37'-39'	7	11	12	15	.2%	8
			39'-41'	9	9	24	10	1%	10
			41'-43'	10	6	8	16	1%	10
			43'-45'	6	6	8	8	1%	10
			45'-47'	6	25	8	5	1%	10
			47'-49'	12	15	9	9	1%	10
			53'-55'	12	17	14	17	.3%	10
			57'-59'	11	12	14	16	50	10

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-15
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-48.5'

Grouting/Seal

Depth/To	Material/Method
48.5-1.5'	Cave-in
1.5'-surface	Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Date
Started: 5/17/90 Finished: 5/17/90

Elevation
Casing:
Ground: 754.5'
Ref. Pt.:

Water Level 38' Ft. Below surface
Measure On: while drilling

Location See waste lagoon boring location map. 11224.73 East, 8870.52 North

Remarks Sunny and very windy, warm, 70°; no recovery 20'-22' A-1450
spoon T.L.R. 26'-28', 28'-30', 33'-35' samples B-1610
AB-1345

T.L.R. = too little recovery for analysis.

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
23.5'	23.5'	Debris mixed with clayey soil, wood, rubber, metal	18'-20'	14	12	11	8	.03%	10
12.0'	35.5'	Clay, trace of some gravel, gray-green, moist, trace of sand	20'-22'	12	10	6	8	-	-
		Some sand below 7.6'	22'-24'	5	5	20	18	.05	20
8.5'	44'	Sand, fine to med., silty, trace of gravel, gray-green, moist	24'-26'	30	35	30	30	.05	40
		wet below 38'	26'-28'	19	20	14	8	.25	10
4.5'	48.5'	Clay, trace of gravel, gray, moist	28'-30'	10	22	30	42	100	10
			33'-35'	7	6	3	6	.1%	10
			36'-38'	8	8	8	8	.5%	10
		48.5' Bottom of Boring	38'-40'	15	12	16	11	.5%	10
			43'-44.5'	30	40	150	-	.03%	10
			48'-48.5'	160	-	-	-	30	10

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: WL-16
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-20'

Grouting/Seal

Depth/To	Material/Method
20'-2'	Cave-in
2'-surface	Hole-Plug

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing

Dia.	Type	Depth Set
N/A		To
		To

Remarks A-1730, B-1800

Date
Started: 5/7/90 Finished: 5/7/90

Elevation
Casing:
Ground: 752.7'
Ref. Pt.:

Water Level Ft. Below
Measure On: none encountered

Location See waste lagoon boring location map. 11140.35 East, 9150.85 North

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	24"	OVA	Background
11.5'	11.5'	Debris mixed with clayey soil, black-brown, moist	12'-14'	5	9	8	11	50	10
4.5'	16.0'	Clay, trace of gravel, gray, moist, wood, brick A	14'-16'	2	4	17	17	.15%	10
4.0'	20.0'	Clay, trace of gravel-rounded, fine to coarse	16'-17.3'	15	25	50/3	0	100	10
		B, B-DP	18'-20'	12	26	20	27	100	10
		20' Bottom of Boring							

Phase II Wells and Borings

Buried Lagoon Borings (BL)

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: BL-01
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
3 1/4" HSA 0'-45.0'

Grouting/Seal
Depth/To Material/Method
45.0'-surface Cement-bent. grout

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 2/13/90 Finished: 2/14/90

Elevation
Casing:
Ground: 735.0'
Ref. Pt.:

Water Level 39.5' Ft. Below surface
Measure On:

Location See boring location diagram
11144.85 East, 8678.58 North

Remarks No wet soil above clay at 13.7'. Cobble zone at 36'-37'; very gravelly sand 38.5' to 40' depth.

Thickness (feet)	Depth to Base (feet)	LITHOLOGIC DESCRIPTION	Blow Counts	Sample Depth	6"	12"	18"	Hnu	Background	Analysis
13.7'	13.7'	Gravel-silt-sand, some cobbles, moist, brown, no odor	(SP-GP)	1-2.5	6	18	18	4.5	3	
3.3'	17.0'	Clay, trace gravel, sand, moist, brown, gravel is rounded	(CL)	3.5'-5.0'	44	28	23	15	2	A
7.0'	24.0'	Gravel and sand, some silt, moist (wet lense 23'-24')	(GP-SP)	6.0'-7.5'	13	15	14	4.5	2	
7.5'	31.5'	Clay, some gravel, moist, gray-green, odorous	(CL)	8.5'-10'	16	26	20	7	3	B
3.0'	34.5'	Sand, some gravel, silty, brown, odorous	(SP)	13.5'-15'	31	19	41	4	3	
4.5'	39.0'	Clay, trace of gravel, moist, gray-green, odorous	(CL)	20.5'-22'	55	45	26	50	3	C
6.0'	45.0'	Sand, some gravel, very moist, gray-green, odorous	(SW)	23.5'-24.5'	125	85	-	30	3	D
		Wet below 39.5', sand is black-green in 43.5'-45' spoon, odorous		28.5'-29'	100	-	-	50	3	
				30.5'-32'	45	55	50	.02%	3	E
		45' bottom of boring		33.5'-35'	45	55	50	.03%	3	F
				38.5'-40'	14	16	17	1%	3	G
				43.5'-45'	23	16	13	.02%	3	H

WW Engineering & Science, Inc.
Environmental Services Division

Page: 1 of 1
Well/Boring No.: BL-02
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
3 1/4" HSA 0'-42.5'

Grouting/Seal
Depth/To Material/Method
42.5'-surface Cement-bent. grout

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 2/12/90 Finished: 2/13/90

Elevation
Casing:
Ground: 732.5'
Ref. Pt.:

Water Level Ft. Below
Measure On: none encountered

Location See boring location diagram
11046.99 East, 8798.78 North

Remarks No recovery 1'-2.5' spoon, 4-5.5' sample had a slight odor. Darkened gray-green zone from 14'-14.25', strong paint smell. Not enough recovery in 18.5'-20' sample for analysis; took spoon from 20'-21.5' to complete sample. *

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	OVA ppm	Analysis	
2.0'	2.0'	Sand and gravel, silty, some boulders, light brown, moist (SP-GP)	1-2.5	18	16	16	-		
5.0'	7.0'	Sand, fine to med., silty, trace of gravel, brown, moist, some gravel	2.5'-5.0'	6	7	12	0		
		6'-7' (SW)	4.0'-5.5'	18	13	11	0		A
2.0'	9.0'	Silt-clay, some sand, trace of gravel, moist, light brown (CL)	6.0'-7.5'	14	9	15	0		
5.0'	14.0'	Sand and gravel, silty, moist, light brown, wet lense 13.5'-14' (SP-GP)	8.5'-10'	12	13	10	5		B
15.0'	29.0'	Silt-clay, some sand, gravel, moist, "paint" odor, some coarse gravel	13.5'-15'	11	16	23	75		C
		and boulders 23.5'-25' (CL-ML)	18.5'-20'	8	17	19	25		D
3.0'	32.0'	Sand, fine to med., light brown, moist, odorous (SW)	20'-21.5'	11	16	30	600		D
6.0'	39.5'	Silt-clay, gravelly, moist, gray (CL-ML)	23.5'-25'	16	30	40	300		E
4.0'	43.5'	Shale, weathered, lenses of limestone	27.5'-29'	68	50/3	-	325		F
			29'-30.5'	30	50	50	.45%		G
		43.5' bottom of boring	33.5'-34'	100/3	-	-	.02%		
			35.3'-36.8'	44	42	50	.02%		
		* Driller felt softening @ 26.5', took sample to investigate. Driller	38.5'-40'	50	125/3"	-	.02%		
		felt change @ 35.3'. Not enough recovery in 33.5'-36.8' sample for	42.5'-43.5'	12	50/3"	-	100		
		analysis. Not enough recovery for analysis bottles @ 38.5'-40'.							
		Refusal @ 43.5'.							

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: BL-03
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
3 1/4" HSA 0'-9.0'

Grouting/Seal
Depth/To Material/Method
9.0'-surface Cement-bent. grout

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 2/11/90 Finished: 2/11/90

Elevation
Casing:
Ground: 732.5'
Ref. Pt.:

Water Level 8.5' Ft. Below surface
Measure On: 2-11-90 while drilling

Location See boring location diagram
11017.85 East, 8956.05 North

Remarks No recovery from 6.0-7.5' sample.
DP = duplicate sample, sample A was also a matrix spike.

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	OVM	Analysis
3.0'	3.0'	Gravel and sand, silty, moist, light brown, some boulders at surface	(SP-GP)	1'-2.5'	1	3	20	0	
4.5'	7.5'	Clay, gravelly, some boulders, some sand, light broown, moist	(CL)	3.5'-5.0'	11	13	22	0	
1.5'	9.0'	Sand-clay-gravel, light brown, moist (wet below 8.5')	(SP-GP)	6'-7.5'	10	15	22	-	
				7.5'-9.0'	12	15	24	0	A, DP
		9.0' bottom of boring							

Buried Pit Borings (BP)

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: BP-01
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
3 1/4" HSA 0'-20'

Grouting/Seal
Depth/To Material/Method
20'-surface Cement-bent. grout

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 2/6/90 Finished: 2/6/90

Elevation
Casing:
Ground: 664'
Ref. Pt.:

Water Level 0.7' Ft. Below surface
Measure On: 2/6/90 while drilling

Location See boring location diagram
9782.46 East, 8425.33 North

Remarks Split-spoon sampling done with a 3" steel split spoon. Cement-bentonite grout formula was 1 bag cement/6 gallons water and enough bent to thicken the slurry. Sample for analysis taken from 0-1.5' depth. *

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	Hnu	Analysis
18.0'	18.0'	Gravel and sand, some silt and clay, wood, very	(GP-SP)	1'-2.5'	7	7	5	0	A
		moist, brown (wet below 0.7') (FILL)		3.5'-5.0'	7	6	19	0	
2.0'	20.0'	Silt-clay, trace of gravel, moist, gray, no shells present in	(CL)	6'-7.5'	4	6	50/3	0	
		clay, gravel is rounded		8.5'-10'	22	18	17	0	
				13.5'-14.5'	30	73	-	0	
		20' bottom of boring		15'-15.3'	100/4"	-	-	0	
				18.5'-20'	17	24	35	0	

*The gravel and sand (0-18') zone seemed fairly porous and permeable while the silt-clay (18'-20') seemed less porous and relatively impermeable.

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Page: 1 of 1
Well/Boring No.: BP-02
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
3 1/4" HSA 0'-10.0'

Grouting/Seal
Depth/To Material/Method
10.0'-surface Cement-bent. grout

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 2/6/90 Finished: 2/7/90

Elevation
Casing:
Ground: 666.1'
Ref. Pt.:

Water Level 7.0' Ft. Below surface
Measure On: 2/6/90 while drilling

Location See boring location diagram
9744.81 East, 8397.97 North

Remarks Hnu was not working, switched to OVA, 1/2 hr standby. OVA reading on first sample (0-1.5) was from head space in description jar. Sample C (6'-7.5') was sampled due to a black discoloration of the soil.

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 6"	12"	18"	OVA	Analysis
7.0'	7.0'	Silt, clay, trace of gravel, moist, gray	(CL)	0'-1.5'	6	6	9	9	A, D+
3.0'	10.0'	Sand and gravel, silty, brown, wet	(SP-GP)	1.5'-2.5'	4	6	7	0	
				3.5'-5.0'	3	14	15	25	B
				6'-7.5'	4	5	6	0	C
				8.5'-10'	6	4	3	24	D
		10.0' bottom of boring							

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: BP-03
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
3 1/4" HSA 0'-17.0'

Grouting/Seal
Depth/To Material/Method
17'-surface Cement-bent. grout

Development N/A

Screen
Manufacturer: N/A
Material:
Model:
Slot/Gauze: Dia.:
Length:
Depth Set: To:

Casing
Dia. Type Depth Set
N/A To
To

Date
Started: 2/7/90 Finished: 2/7/90

Elevation
Casing:
Ground: 665.0'
Ref. Pt.:

Water Level 2.0' Ft. Below surface
Measure On: 2/7/90 while drilling

Location See boring location diagram
9779.33 East, 8462.39 North

Remarks OVM background 0-0.2 ppm. Driller felt a change at 15.5', took spoon to verify change in lithology. 3" split spoons were cleaned with an alconox wash and double rinsed with deionized water.

Thickness	(feet) Depth to Base	LITHOLOGIC DESCRIPTION		Sample Depth	Blow Counts 18"	12"	6"	Analysis OVM
15.5'	15.5'	Gravel and sand, some silt-clay, (fill), very moist (wet	(GP-SP)	1-2.5	6	5	5	0
		below 2.0'), coarser gravel perhaps boulders from		3.5'-5.0'	5	5	4	0
		9.0'-15.5'		6.0'-7.5'	5	5	4	0
1.5'	17.0'	Silt-clay, trace of gravel, trace of sand, gray, moist, no	(CL-ML)	8.5'-10'	4	24	22	0
		shells present in clay; gravel is rounded.		13.5'-15'	17	30	30	0
				15.5'-17'	15	22	32	0
		17.0' bottom of boring						

Monitor Well Borings
and
Construction Details (GW)

WW Engineering & Science, Inc.
Environmental Services Division

Page: 1 of 1
Well/Boring No.: GW-24
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s)	Depth
4 1/4" HSA	0'-35'
3 7/8" Rotary Wash	35'-37.5'

Grouting/Seal

Depth/To	Material/Method
23'-16'	Sand pack
16'-15'	Bent. pellets
15'-1.0'	Cement-bent. grout
1.0'-surface	Concrete

Development Teflon bailer- 10 gallons

Screen
Manufacturer: Johnson
Material: stainless steel
Model: wire wound
Slot/Gauze: #10 Dia.: 2"
Length: 5'
Depth Set: 23' To: 18

Casing

Dia.	Type	Depth Set
2"	SS T-304	18 To +2.0
		To

Date
Started: 2/23/90 Finished: 2/26/90

Elevation
Casing: 696.12'
Ground: 694.12'
Ref. Pt.:

Water Level 18.5 Ft. Below surface (17.97 on 2-27-90)
Measure On: 2-23-90 while drilling
9.9 below surface @ 09:30 2-24-90 after sitting overnight

Location See monitor well location map.
11390.9 East, 8502.79 North

Remarks 3.5'-5.0' sample had a suspicious brown color so we took an OVA reading. Thin wet sand lense at bottom of 13.5'-15.0' spoon; took 15'-15.5' spoon to investigate. Brown oily streaks in cuttings coming up around augers. *

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION	Sample Depth	Blow Counts 6"	12"	18"	OVA	Background
15.5'	15.5'	Clay, silty, some gravel, moist, gray-brown, thin lenses of wet (CL)	1-2.5	8	9	10	-	-
		sand at 7' and 14.8'-15'	3.5'-5.0'	11	10	20	9	9
2.0'	17.5'	Limestone	6.0'-7.5'	14	9	17	-	-
0.5'	18.0'	Shale	8.5'-10'	14	29	40	-	-
1.5'	19.5'	Limetone	13.5'-15'	12	20	40	-	-
4.7	24.2'	Shale	15'-15.5'	50	-	-	-	-
0.3'	24.5'	Limestone	18.5'-18.75'	77/3	-	-	-	-
2.5'	27.0'	Shale	23.5'-24.25'	39	50/3	-	-	-
0.4'	27.4'	Limestone						
4.1'	31.5'	Shale						
1.0'	32.5'	Limestone						
5.0'	37.5'	Shale						
		37.5' bottom of boring						

* B.C. Manos (ATEC crew chief) said oily streaks commonly appear when drilling in shales. Descriptions of consolidated rock are based on drilling rates and should be used with geophysical logs for well placement. Fast, easy drilling is considered shale while slow, difficult drilling is considered limestone.

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Environmental Services Division

Page: 1 of 1
Well/Boring No.: GW-25
Client: ARCS-Skinner
Project No.: 04003.07

Well/Boring Log Sheet

County	Township	Fraction	Section	T	R
Butler	Union	1/4 1/4 1/4			

Contractor ATEC
Address: 11121 Canal St.
Cincinnati, Ohio
Equipment: Mobile Drill B-53
Crew Chief: B.C. Manos
Supervisor: M. Potter

Drilling Method(s) **Depth**
4 1/4" HSA 0'-13.2'

Grouting/Seal

Depth/To	Material/Method
13.2'-5'	Sand pack
5'-4'	Bent. pellets
4.0'-1.0'	Bent., cuttings, mix
1.0'-surface	Concrete

Development None-well dry

Screen
Manufacturer: Johnson
Material: stainless steel
Model: wire wound
Slot/Gauze: #10 Dia.: 2"
Length: 5'
Depth Set: 13' To: 8'

Casing

Dia.	Type	Depth Set		
2"	SS T-304	8'	To	+2.0'
			To	

Date
Started: 2/26/90 Finished: 2/26/90

Elevation
Casing: 696.36'
Ground: 694.36'
Ref. Pt.:

Water Level Ft. Below
Measure On: none encountered

Location See monitor well location map
11391.47 East, 8496.79 North

Remarks

Thickness	Depth to Base (feet)	LITHOLOGIC DESCRIPTION	Sample Depth	Background	OVA	18"	12"	6"
13.2'	13.2'	Clay, silty, some gravel, moist, gray-brown, thin lenses of wet (CL)	1-2.5	8	9	10	-	-
		sand at 7' and 14.8'-15'	3.5'-5.0'	11	10	20	9	9
			6.0'-7.5'	14	9	17	-	-
		13.2' bottom of boring	8.5'-10'	14	29	40	-	-