CITY OF BUFFALO

DEPARTMENT OF LAW

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Greater Buffalo All-America City 1996

February 5, 1998

Joseph P. Ryan, Esq.
N.Y.S. Dept. of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Martin J. Doster
N.Y.S. Dept. of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: "Lime" Piles; 90 Hopkins St.

Gentlemen:

Enclosed please find the results of Malcolm Pirnie's analysis of the lime piles at 90 Hopkins St. performed pursuant to your request. This property, currently owned by the City of Buffalo, was obtained through tax foreclosure in approximately 1987. This property has never been utilized by the City for any purpose during the term of its ownership. We have title information dating back to 1950 as well as aerial photographs of this site. Our information leads us to believe that this material was placed on site several decades before the City obtained title.

Upon review of the enclosed information, please contact myself to arrange for a meeting to discuss the results, options available to the City, as well as available recourse against the parties responsible for placing these substances on site. The City will assist the State in any way to pursue those entities responsible for the disposal of this lime. I look forward to hearing from you.

Very truly yours,

MICHAEL B. RISMAN
Acting Corporation Counsel

Sandra Nasca

Sandra A. Nasca
Assistant Corporation Counsel

SAN:mam
Encl.
cc: Joseph Ryan, Commissioner, Community Development
Mark Tytka, Deputy Director of Planning
Dennis Sutton, Office of the Environment
Kevin Greiner, BEDC

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MALCOLM PIRNIE

ATTACHMENT A

Characterization of City of Buffalo Hopkins Street Lime Piles

A sampling and analysis program was implemented to characterize the two "lime" piles located on property off Hopkins St. in South Buffalo owned by the City of Buffalo. The property is located northeast of the Marilla Street Landfill and west of Hopkins Street. The sampling was performed by Malcolm Pirnie, Inc. on December 8 and 10, 1997 in accordance with the letter work plan to Mr. David Sengbusch dated December 2, 1997 (copy attached).

A total of nine test pits were excavated to depths of approximately 20 feet below the top grade on the lime piles to physically characterize the fill conditions and collect samples for laboratory analysis. The test pit locations are shown on the attached Site Inspection Logs. The test pits were excavated to the fill/native soil interface with an excavator provided by BDR Inc. The fill/native soil interface generally occurred at a depth of 20 feet below the top of the lime piles. Lime pile samples were collected and described by a Malcolm Pirnie geologist including color, visible or olfactory evidence of subsurface contamination, and moisture conditions.

At each test pit location, lime material was present over native clayey-silt soil. Groundwater generally entered the excavations at a depth of approximately 19 feet below surface. The lime material present at each location was heterogeneous and consisted of loose fine-grained, horizontally stratified material. Each layer was defined by a color change from gray/white to dark brown. A texture difference corresponded to the color change. The thicker gray/white layer was generally loose when disturbed, fine-grained and moist to wet. The thin dark brown layer crumbled when disturbed and appeared to be an oxidized version of the lighter gray/white layer. The native soil consisted of lacustrine-derived oxidized orange-brown sandy-silt with vegetation grading to a medium to dark gray color with depth. The soil descriptions are included in the attached test pit inspection logs.

Samples were collected at each test pit location and submitted to Columbia Analytical Laboratories for analysis. Each test pit was segmented into 4-foot intervals to

facilitate the collection of composite samples for a certain depth interval (each interval was assumed to be a distinct layer) in each lime pile. The composite samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile compounds (SVOCs), Target Analyte List (TAL) metals, total cyanide, and pH. In addition, two grab samples (LP-A and LP-B) were collected and analyzed for Toxicity Characteristic Leaching Procedure (TCLP). In addition, one sample (LP-B) was submitted to Schwarzkopf Microanalytical Laboratory, Inc. for analysis of the constituents typical of carbide lime (iron and alumina oxides, magnesium oxides, and free carbon).

A comparison of the lime pile analytical results to the typical compositions of carbide lime and commercial hydrate lime is presented in Table 1. The results of the iron and alumina oxide analyses of the lime pile do not conclusively indicate whether the lime pile is carbide lime or commercial hydrate lime. However, the presence of free carbon and the very low concentration of magnesium oxide in the lime pile sample indicate that the piles could be of carbide lime origin. Detailed characterization data for carbide lime and commercial hydrate lime are included in Appendix 1. Calculations converting percent iron, aluminum, and magnesium to percent iron and alumina oxides and magnesium oxide are also included.

The analytical results of the composite samples are summarized in Tables 2 and 3. The results indicate that the constituents of the lime piles are very consistent throughout the depth of each pile. The only VOC detected was acetone. Although acetone was not detected in the associated method blank, acetone is a common laboratory contaminant, and was detected in the samples at low concentrations, below the NYSDEC Soil Cleanup Guideline in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046. No SVOCs were detected.

Of the TAL metals, only beryllium, chromium, iron, and zinc were detected in concentrations slightly exceeding the NYSDEC Soil Cleanup Guidelines. Additionally,

calcium concentrations exceeded the Eastern United States background concentration range included in NYSDEC TAGM 4046 (130 to 35,000 mg/kg). The calcium concentrations were very consistent throughout the samples, and ranged from 421,000 to 476,000 mg/kg. These analytical results are consistent with the preliminary determination that the piles were composed of lime material.

The high pH (12.6 and 12.7) measured in every sample is also indicative of lime. pH measurements above 12.0 are characteristic of a RCRA corrosive waste, and therefore the material may be classified as a hazardous waste.

Discrete samples were collected from the intervals 12 to 16 feet below the top of the two lime piles at test pit locations TP-2 and TP-8 for analysis of TCLP parameters and RCRA Hazardous Waste Characteristics. These analyses indicate that, excepting pH (corrosivity), the waste would not be considered a RCRA Characteristic Hazardous Waste.

Table 1
Lime Pile Sampling

Comparison of Analyses

Parameter	Lime Pile Sample Analysis (Percent)	Typical Carbide Lime Analysis (Percent)	Typical Commercial Hydrate Lime Analysis (Percent)
Free Carbon	0.31	0.54	0.00
Iron and Alumina Oxides	0.89	1.73	0.64
Magnesium Oxide	0.046	0.07	0.91

Table 2
Lime Pile Sampling
Summary of Analytical Results

Sample Location	NYSDEC	Eastern USA	A-1	A-2	A-3	A-4	A-5	B-1	B-2	B-3	B-4	B-5
Sampling Depth	TAGM	Background	0-4	4-8	8-12	12-16	16-20	0-4	4-8	8-12	12-16	16-20
Collection Date	4046	Concentrations	12/8/97	12/8/97	12/8/97	12/8/97	12/8/97	12/10/97	12/10/97	12/10/97	12/10/97	12/10/97
Volatile Organic Compounds (mg/kg)												
Acetone	0.2		0.059	0.097	0.061	0.018	0.011		0.049	0.046	0.067	0.1
Semivolatile Organic Compounds (mg/kg)			None detected									
Metals (mg/kg)												
Aluminum	SB	33000	5240	5480	4610	4870	6120	5380	4460	4920	4940	5300
Arsenic	7.5 or SB	3 - 12	1.89		2.01	3.18	7.34	2.91	3.07	3.58	2.32	2.23
Barium	300 or SB	15 - 600	4.78	4.71	6.27	7.23	22.6	11.2	5.15	7.08	6.15	11
Beryllium	.016 or SB	0 - 1.75	1.16	1.06	1.34	1.57	1.14	1.46	1.09	1.7	1.51	1.17
Calcium	SB	130-35000	476000	450000	459000	445000	436000	439000	461000	437000	421000	444000
Chromium	10 or SB	1.5 - 40	3.06		2.03	3.22	12.4	2.76		3.85	4.33	15.3
Copper	25 or SB	1 - 50	6.13	5.46	5.12	5.95	9.2	5.69	5.92	4.9	9.66	7.77
Iron	2000 or SB	2000 - 550000	1230	578	792	2430	10000	3520	1270	3130	4100	1430
Lead	30 or SB	4 - 500					15.5					
Magnesium	SB	100 - 5000	557	316	374	464	612	502	416	431	678	594
Manganese	SB	50 - 5000	37.6	11.8	9.49	48.6	210	67.2	27.2	50.8	64.2	21
Silver	SB	NA	3.07	3	3.04	3.2	3.35	3.14	3.05	3.02	3.03	2.88
Sodium	SB	6000 - 8000	155	189	165	123	209	136	191	125	211	158
Vanadium	150 or SB	1 - 300			18							
Zinc	20 or SB	9 - 50	40	12.7	11.7	19.8	74.8	38.9	17.5	17.4	33.7	16.3
Cyanide	NA	NA	2.57					2.03				
pH												
	NA	NA	12.6	12.6	12.7	12.7	12.7	12.6	12.6	12.7	12.6	12.6

Notes:

1. Background concentrations from NYSDEC TAGM 4046.
2. Only analytes detected in at least one sample are contained in this table.
3. Blank space denotes analyte was not detected.
4. Shading indicates sample results exceeded NYSDEC TAGM 4046 Soil Cleanup Guidelines or Background Concentration Range.
5. NA - Soil Cleanup Guideline or Background Concentraton Range not included in NYSDEC TAGM 4046.

Table 3
Lime Pile Sampling
Summary of Analytical Results - TCLP

Sample Location	LP-A	LP-B
Sampling Depth (ft.)	12-16	12-16
Collection Date	12/8/97	12/10/97
Volatile Organic Compounds (in ug/L)		
Benzene	ND	ND
Carbon tetrachloride	ND	ND
Chlorobenzene	ND	ND
Chloroform	ND	ND
1,2-Dichloroethane	ND	ND
1,1-Dichlororethene	ND	ND
Methyl ethyl ketone	ND	ND
Tetrachloroethene	ND	ND
Trichlororethene	ND	ND
Vinyl chloride	ND	ND
Semivolatile Organic Compounds (in ug/L)		
1,4-Dichlorobenzene	ND	ND
2,4-Dinitrotoluene	ND	ND
Hexachlorobenzene	ND	ND
Hexachloro-1,3-butadiene	ND	ND
Hexachloroethane	ND	ND
2-Methylphenol	ND	ND
3+4-Methylphenol	ND	ND
Nitrobenzene	ND	ND
Pentachlorophenol	ND	ND
Pyridine	ND	ND
2,4,5-Trichlorophenol	ND	ND
2,4,6-Trichlorophenol	ND	ND
Metals (in ug/L)		
Arsenic	ND	ND
Barium	ND	ND
Cadmium	ND	ND
Chromium	ND	ND
Lead	ND	ND
Mercury	ND	ND
Selenium	ND	ND
Silver	ND	ND
RCRA Characteristics		
Reactivity - Cyanide	ND	ND
Reactivity - Sulfide	ND	ND
pH	12.7	12.6
Flash Point (Degress Celsius)	> 100	>100

Notes:
ND - Analyte not detected.

MALCOLM PIRNIE

APPENDIX 1

LIME CALCULATIONS

MALCOLM PIRNIE

MALCOLM PIRNIE, INC.

BY GPH DATE 1/23 SHEET NO. 1 OF 1

CHKD. BY ..... DATE ..... JOB NO. .....

SUBJECT .....

BASIS: 100 lbs LIME

ASSUME: ① IRON AND ALUMINUM ARE PRESENT IN THE LIME AS IRON AND ALUMINA OXIDES.

② MAGNESIUM IS PRESENT IN THE LIME AS MAGNESIUM OXIDE

① CALCULATE PERCENTAGE OF IRON AND ALUMINA OXIDES

ALUMINUM: $0.012\,lb\,Al \times \frac{1\,lb\,mol\,Al}{27\,lb\,Al} \times \frac{1\,lb\,mol\,Al_2O_3}{2\,lb\,mol\,Al} \times \frac{102\,lb\,Al_2O_3}{1\,lb\,mol\,Al_2O_3} = 0.02\,lb\,Al_2O_3$

IRON: $0.61\,lb\,Fe \times \frac{1\,lb\,mol\,Fe}{55.8\,lb\,Fe} \times \frac{1\,lb\,mol\,Fe_2O_3}{2\,lb\,mol\,Fe} \times \frac{159.6\,lb\,Fe_2O_3}{1\,lb\,mol\,Fe_2O_3} = 0.87\,lb\,Fe_2O_3$

TOTAL WEIGHT OF Al_2O_3 & Fe_2O_3 = 0.89 lb

PERCENTAGE Al_2O_3 & Fe_2O_3 = $\frac{0.89\,lb}{100\,lb}$ = <u>0.89%</u>

② CALCULATE PERCENTAGE OF MAGNESIUM OXIDE

$0.028\,lb\,Mg \times \frac{1\,lb\,mol\,Mg}{24.3\,lb\,Mg} \times \frac{1\,lb\,mol\,MgO}{1\,lb\,mol\,Mg} \times \frac{40.3\,lb\,MgO}{1\,lb\,mol\,MgO} = 0.046\,lb$

PERCENTAGE $MgO = \frac{0.046\,lb\,Mg}{100\,lb\,Lime}$ = <u>0.046% MgO</u>

SCHWARZKOPF MICROANALYTICAL LABORATORY, INC.
56-19 37th Ave.
Woodside, N.Y. 11377
Tel. 718-429-6248
Fax. 718-397-7144

Frank E Maple, Pres.
Florence Wohl, Exec V.P.

Jeanne Asquith
MALCOLM PIRNIE

Date
12/18/97
Report
9524114

RESULTS OF ANALYSIS

SAMPLE NUMBER
LP-B

SML #
D86994

% Aluminum	.....	**0.012**
% Carbon (free)	.....	**0.31**
% Iron	.....	**0.61**
% Magnesium	.....	**0.028**

SCHWARZKOPF MICROANALYTICAL LABORATORY, INC.

Edmund Petro
Technical Director

Finger Lakes Lime Inc.

P.O. Box 1098 Weedsport N.Y. 13166 Tel. (315) 463-8417

TYPICAL CARBIDE LIME COMPOSITION

THE FOLLOWING IS A TYPICAL ANALYSIS OF CARBIDE LIME AS COMPARED TO TWO COMMERCIAL HYDRATE SAMPLES.

	CARBIDE LIME		COMMERCIAL HYDRATES	
	SLURRY	DRY	SAMPLE #1	SAMPLE #2
CALCIUM HYDROXIDE $Ca(OH)_2$	92.50	90.60	94.30	91.60
AVAILABLE CALCIUM OXIDE CaO	70.01	68.60	71.40	69.40
CALCIUM CARBONATE $CaCO_3$	1.85	2.20	2.13	4.01
SILICA SiO_2	1.50	1.76	0.81	1.30
IRON AND ALUMINA OXIDES R_2O_3	1.60	1.73	0.38	0.90
MAGNESIUM OXIDES MgO	0.07	0.07	0.57	1.25
SULFUR	0.15	0.15	0.03	0.10
PHOSPHORUS	0.01	0.01	0.01	0.01
FREE CARBON	0.50	0.54	0.00	0.00
FREE WATER	-----	0.94	0.42	0.31
RESIDUAL	1.82	2.00	1.35	0.52

MALCOLM PIRNIE

APPENDIX 2

INSPECTOR'S FIELD LOGS

DATE: 12/10/97

DAY:	S	M	T	W	TH	F	S
				X			

Project: Lime Pile Investigation

Project No.: 0848-262-113

Client: City of Buffalo / LTV Steel

Location: Hopkins Street, South Buffalo

Subject: Subsurface Investigation

MPI Staff: BCH

WEATHER:	Bright Sun	Clear	Overcast X	Rain	Snow
TEMP.:	To 32 X	32 - 50	50 - 70	70 - 85	85 up
WIND:	Still	Moderate X	High	Report No.	
HUMIDITY:	Dry X	Moderate	Humid		

Observations:

On site @ 7:45
Liebherr 912 excavator w/ 36" bucket used

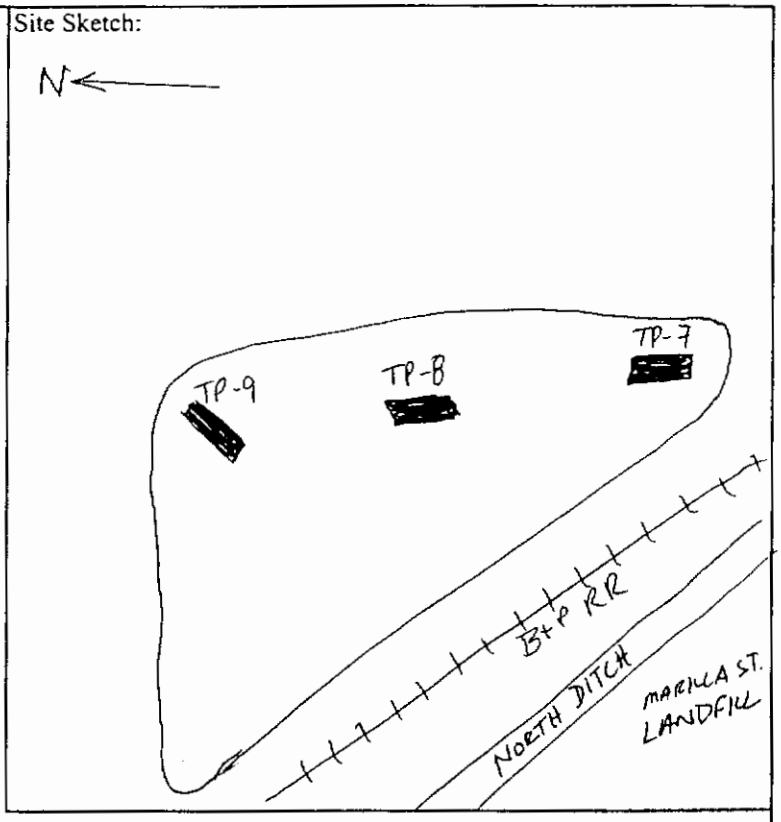
Lime Pile B - larger of 2 piles
TP-7
TP-8
TP-9

approximate total depth of Lime Pile B is 19.5'

+ composite samples of five layers collected
+ grab samples for VOCs collected at TP-8
+ TCLP samples collected @ TP-8 @ 12.0'-16.0' deep

Samples collected directly from bucket w/ Stainless steel Hovel and spoon

Site Sketch:



DISTRIBUTION:

1. Proj. Mgr.
2. Field Office
3. File
4. Owner

Signature _____ Title _____

DATE: 12/8/97

DAY:	S	M	T	W	TH	F	S
		X					

Project: Lime Pile Investigation

Project No.: 0848-262-113

Client: City of Buffalo / LTV Steel

Location: Hopkins Street, South Buffalo

Subject: Subsurface Investigation

MPI Staff: BCH

WEATHER:	Bright Sun	Clear	Overcast X	Rain	Snow
TEMP.:	To 32	32 - 50 X	50 - 70	70 - 85	85 up
WIND:	Still	Moderate X	High	Report No.	
HUMIDITY:	Dry X	Moderate	Humid		

Observations:

Started test pits: 10:08
ended test pits: 15:30

used Liebherr 912 excavator w/ 36" wide bucket

Dennis Sutton (C. of Buffalo) on site @ 9:50, off site @ 11:10
Others on site @ 11:30
Wayne Gould - LTV Steel
Jaspal Walia - NYS DEC
Jim Tuk - NYS DEC
Terry Ried - MPI

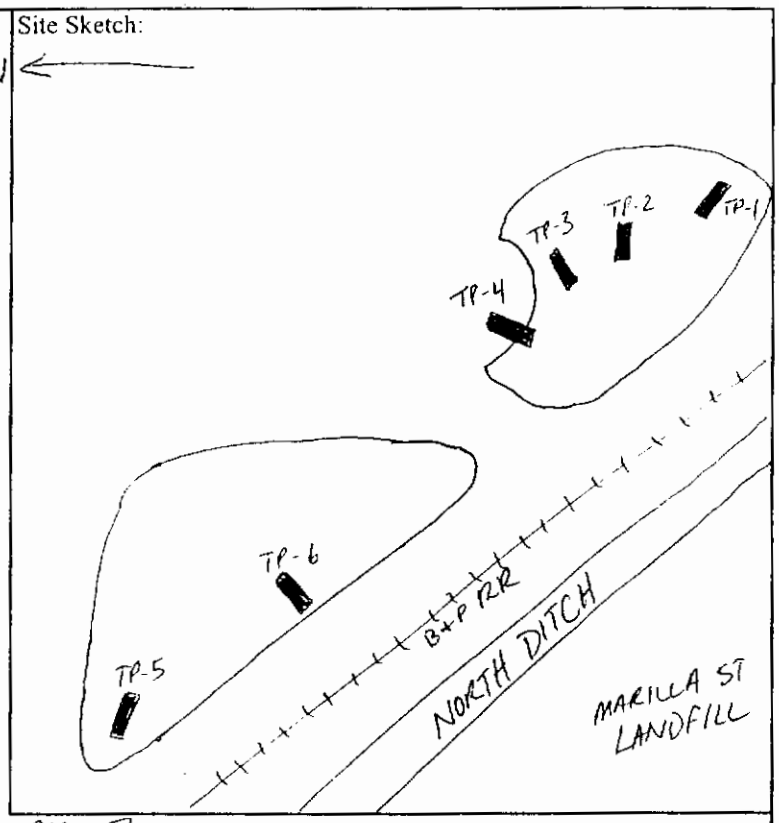
- Smaller of 2 Lime piles designated as Lime Pile A
test pits labeled chronologically
TP-1, TP-2, TP-3, TP-4 } Lime Pile A

- larger of 2 Lime piles designated as Lime Pile B
test pits labeled as:
TP-5
TP-6

- approximate depth of Lime Pile A: 22'
" " " " B: 19.5'

- Will continue with three more test pits in Lime Pile B
- Samples collected directly from bucket w/ stainless steel trowel + spoon

Site Sketch:



Samples collected for each Pile:
+ composite sample of five layers
+ grab sample of each layer at one test pit analyzed for VOCs (TP-2)
+ TCLP samples collected @ TP-2 from 12'-16'

DISTRIBUTION:
1. Proj. Mgr.
2. Field Office
3. File
4. Owner

Signature: [signature] Title: GEOLOGIST

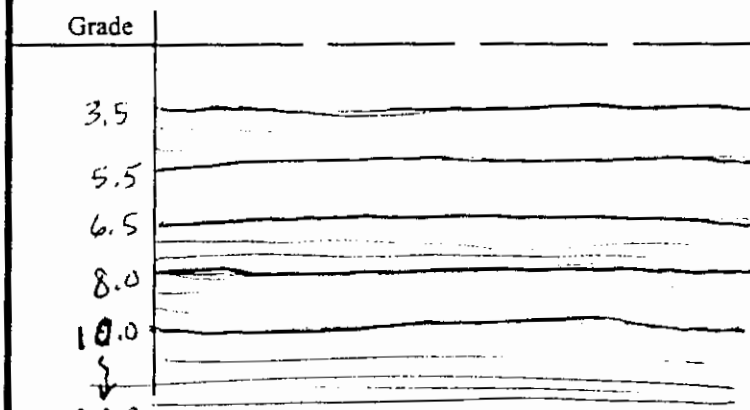
MALCOLM PIRNIE

Project:	Lime Pile Characterization	Excavation Dates:	12/8/97
Project No.:	0848-262-113	Excavation Method:	Backhoe
Client:	LTV Steel - City of Buffalo	Logged / Checked By:	BCH
Location:	South Buffalo	Test Pit Location #:	TP-1

Test Pit Location:

start: 10:40
end: 11:15
(see map)

Test Pit Cross Section:



Depth BGS	Soil Description	Graphic Log	Photos Y / N	Samples Y / N	Comments (Include seepage horizons)
0.0 - 3.0	Light grey white, chalky lime - wi roots dense, loose when dist moist, stratified layers layers defined by dark brown (thin) topsoil material (oxidized lime)	- sublayers within each major layer ~ 6" thick - change in shades of grey			Composite sample collected 10:14
3.0 - 7.0	same A/A, darker grey				comp. sample 10:20
7.0 - 10.0	same A/A stratified ~ every foot	- breaks off in blocks then crumbles			comp. sample 10:30
10.0 - 15.0	same A/A, dry - ~~wet~~ moist				comp sample 10:41
15.0 - 20.0	same A/A, wet 19.0 groundwater encountered in test pit, increase in dark brown/black crust, poss. f. SAND or oxidized material				comp. sample 10:50
	15' long 20' deep				
	DK brown crusty, f. SAND layers between ~ 3 6" lifts between each crusty layer				

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Sheet ___ of ___

MALCOLM PIRNIE

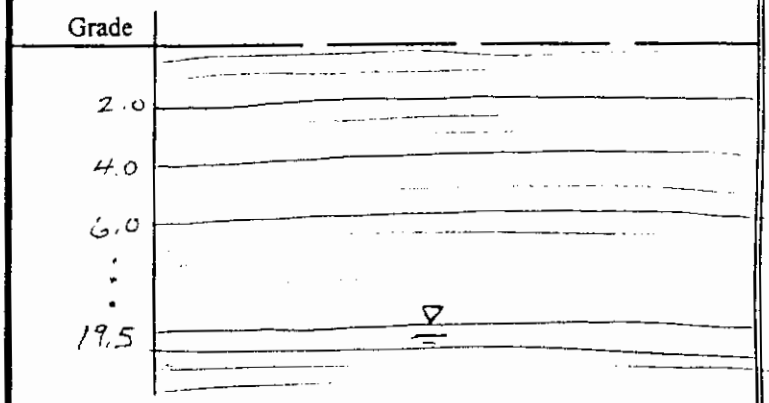
Project:	Lime Pile Characterization	Excavation Dates:	
Project No.:	0848-262-113	Excavation Method:	Backhoe
Client:	LTV Steel - City of Buffalo	Logged / Checked By:	BCH
Location:	South Buffalo	Test Pit Location #:	TP- 2

Test Pit Location:

start: 11:18
end 12:15

see map

Test Pit Cross Section:



Depth BGS	Soil Description	Graphic Log	Photos Y / N	Samples Y / N	Comments (Include seepage horizons)
0.0 - 4.0	lt. grey/white fine grained material (Lime), moist loose when disturbed, dense	- ~6" stratified layers - 3 layers per main layer - main layers ~1' thick		1'-2'	comp. sample 11:22 VOC 1 taken 11:22
4.0 - 8.5	Same A/A				comp. sample 11:32 VOC 2 taken 11:32
8.5 - 12.0	Same A/A				comp. sample 11:44 VOC 3 taken 11:44
12.0 - 16.0	Same A/A, moist - wet				Comp. sample 11:50 VOC 4 taken 11:50 TCLP list taken 11:50
16.0 - 19.5	Same A/A, moist - wet wet near 20' groundwater @ 19.0'				comp. sample 12:00 VOC 5 taken 12:00
	19.5' deep 15' long				
	Stratified horizontal layers - thin layers of DK brown oxidized f. grained material (lime) - occur about every 2'				

Sheet ___ of ___

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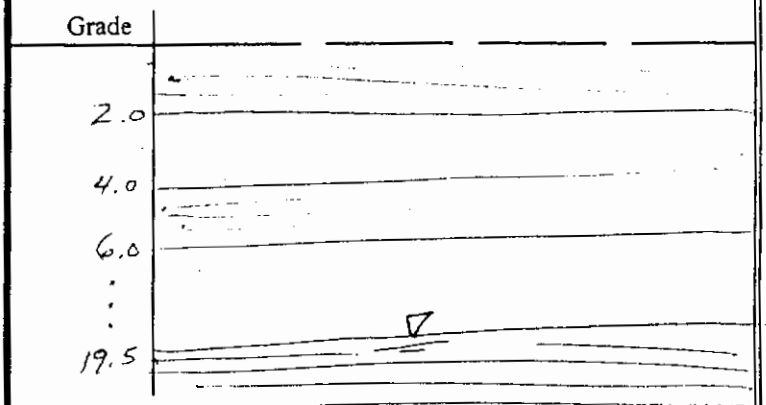
MALCOLM PIRNIE

Project:	Lime Pile Characterization	Excavation Dates:	12/8/97
Project No.:	0848-262-113	Excavation Method:	Backhoe
Client:	LTV Steel - City of Buffalo	Logged / Checked By:	BCH
Location:	South Buffalo	Test Pit Location #:	TP-3

Test Pit Location:

start: 13:10
end: 13:40 See map

Test Pit Cross Section:



Depth BGS	Soil Description	Graphic Log	Photos Y/N	Samples Y/N	Comments (Include seepage horizons)
0.0 - 4.0	lt grey/white fine grained lime like when disturbed, moist, ~6" stratified layers make up a large 1-2' layer, designated by thin crust like layers (as seen on surface), dense, chunky → DK brown, fi grained material				comp sample 13:14
4.0 - 8.0	same A/A, moist				comp. sample 13:18
8.0 - 12.0	same A/A, dry - moist				comp. sample 13:22
12.0 - 16.0	same A/A,				comp sample 13:25
16.0 - 20.0	same A/A, moist - wet				comp. sample 13:30
	20' deep 15' long				

Sheet ___ of ___

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MALCOLM PIRNIE

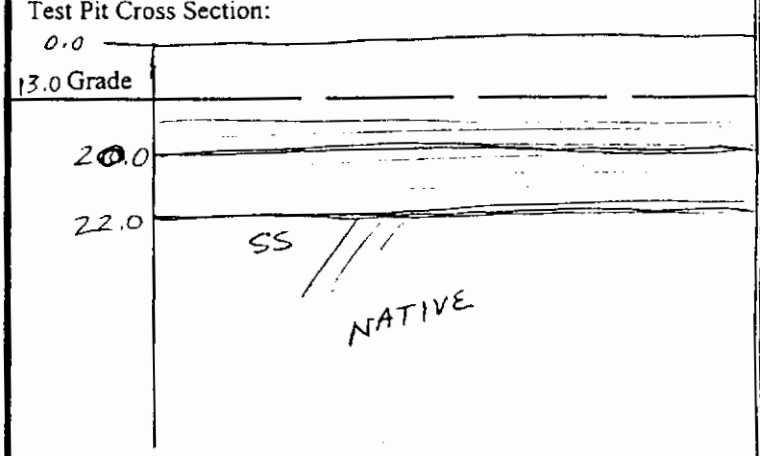
Project:	Lime Pile Characterization	Excavation Dates:	12/8/97
Project No.:	0848-262-113	Excavation Method:	Backhoe
Client:	LTV Steel - City of Buffalo	Logged / Checked By:	BCH
Location:	South Buffalo	Test Pit Location #:	TP- 4

Test Pit Location:

Start: 13:42
end: 14:00

see map

Test Pit Cross Section:



Depth BGS	Soil Description	Graphic Log	Photos Y / N	Samples Y / N	Comments (Include seepage horizons)
13.0 - 22.0	DK grey, wet, dense f grained material (lime)				
	water in @ 18.0 - 19.0'				
22.0 - ??	Black organic Silt + F. SAND grading to DK brown SILTY SAND w/ oxidized lenses silt and f SAND, organic odor oxidized dessication				
	at top - roots, some vegetation				
	22' from top of berm to top of native				
	9' from grade next to test pit				
	10' long				
	10' deep				

Sheet ___ of ___

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MALCOLM PIRNIE

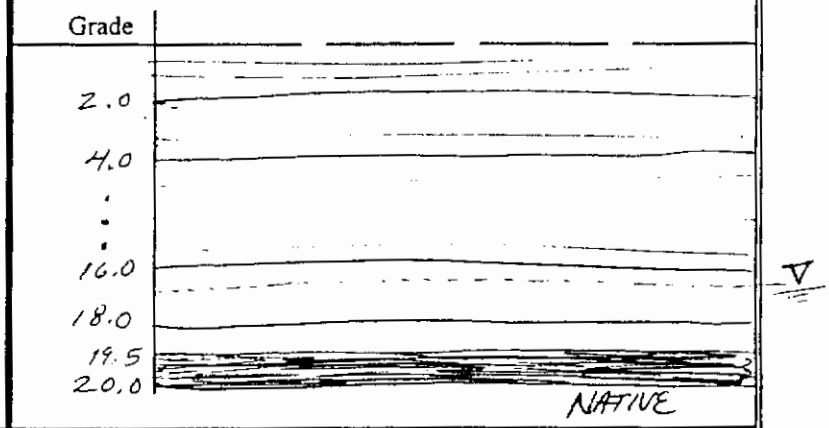
Project:	Lime Pile Characterization	Excavation Dates:	12/8/97
Project No.:	0848-262-113	Excavation Method:	Backhoe
Client:	LTV Steel - City of Buffalo	Logged / Checked By:	BCH
Location:	South Buffalo	Test Pit Location #:	TP- 5

Test Pit Location:

See map

Start: 14:16
end: 14:54

Test Pit Cross Section:



Depth BGS	Soil Description	Graphic Log	Photos Y / N	Samples Y / N	Comments (Include seepage horizons)
0.0 - 4.0	lt. grey/white f. grained material (lime) dense, loose when disturbed ~2' layers, horizontal layers distinct DK brown/black crust layer signifies change in layer - oxidized for a time then filled in on top, moist				Comp sample 14:12
4.0 8.0	Same A/A				Comp sample 14:26
8.0 - 12.0	Same A/A				Comp sample 14:29
12.0 - 16.0	Same A/A, moist - wet				Comp sample 14:32
16.0 - 19.5	same A/A, wet water in @ 16.5				Comp sample 14:37
19.5 - ??	stratified DK brown/black SILT and f. SAND, dense, wet roots + organic material, odor is organic, orange/brown dessication cracks				
	19.5' deep 15' long				

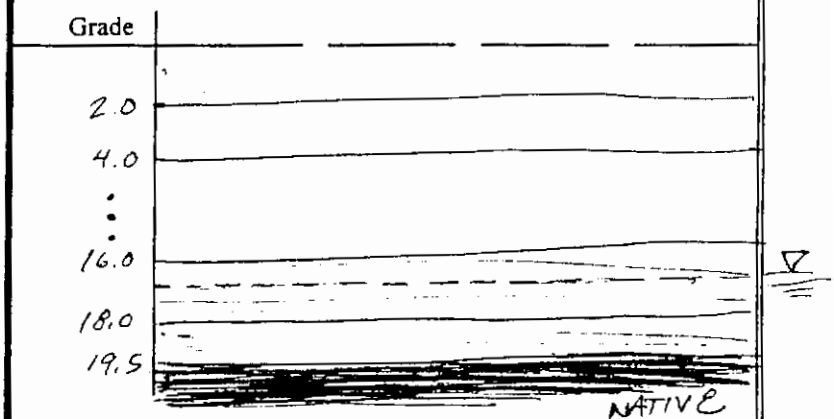
MALCOLM PIRNIE

Project:	Lime Pile Characterization	Excavation Dates:	12/8/97
Project No.:	0848-262-113	Excavation Method:	Backhoe
Client:	LTV Steel - City of Buffalo	Logged / Checked By:	BCH
Location:	South Buffalo	Test Pit Location #:	TP- 6

Test Pit Location:

start: 14:54
end: 15:10

Test Pit Cross Section:



Depth BGS	Soil Description	Graphic Log	Photos Y / N	Samples Y / N	Comments (Include seepage horizons)
0.0 - 4.0	Lt grey/white f grained material ~2' stratified layers, dense, loose when disturbed, moist				comp sample 14:58
4.0 - 8.0	same A/A				comp. sample 15:01
8.0 - 12.0	same A/A				comp sample 15:05
12.0 - 16.0	DK grey @ 14.0', moist - wet				comp. sample 15:08
16.0 - 19.0	same A/A, wet				comp. sample 15:13
19.0 - 19.5	DK Brown/Black organic SILT and f. SAND, dense, wet				
19.5 - ??	Lt. Brown (oxidized) SILT and f. SAND w/ tr. f GRAVEL				
	19.5' deep 15' long				

Sheet ___ of ___

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MALCOLM PIRNIE

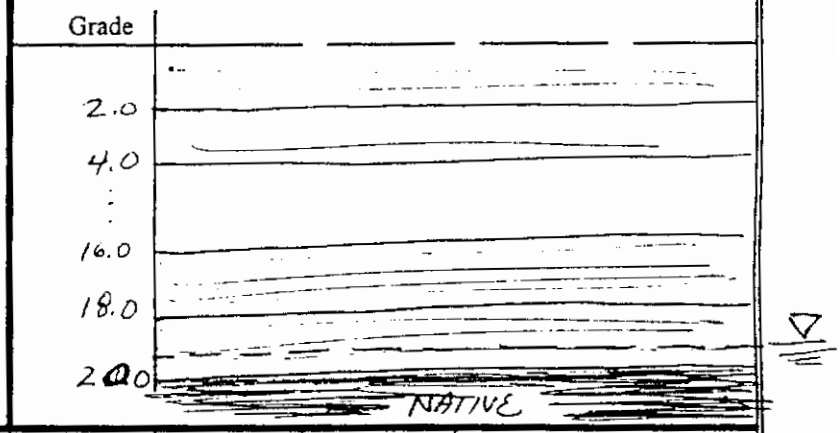
Project:	Lime Pile Characterization	Excavation Dates:	12/10/97
Project No.:	0848-262-113	Excavation Method:	Backhoe
Client:	LTV Steel - City of Buffalo	Logged / Checked By:	BCH
Location:	South Buffalo	Test Pit Location #:	TP- 7

Test Pit Location:

start: 8:04
end: 8.36

SOE map

Test Pit Cross Section:



Depth BGS	Soil Description	Graphic Log	Photos Y/N	Samples Y/N	Comments (Include seepage horizons)
0.0 - 4.0	Lt grey/white f grained material (Lime), loose when disturbed, dense, moist, stratified (horizontal) layers of ~6" make up one larger layer defined by a dark brown crust, loose when disturbed, dry (~ every 2')				Comp taken 8:07
4.0 - 8.0	same A/A, oscilating dark grey and light grey layers, moist				Comp taken 8:11
8.0 - 12.0	same A/A				Comp taken 8:15
12.0 - 16.0	same A/A moist - wet				Comp taken 8:18
16.0 - 20.0	same A/A, wet water in @ 19.5				Comp taken 8:22
20 -	DK. Brown SILT and f. SAND horizontal layers, some oxidized dessication, roots, vegetative decay, organic odor				
	20.5' deep 15' long				

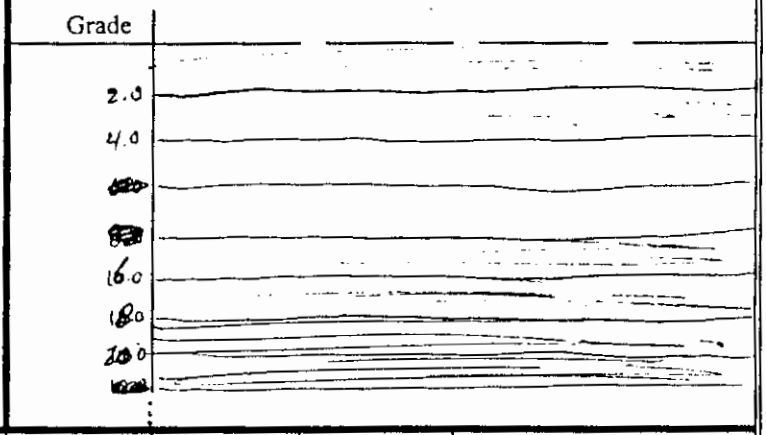
MALCOLM PIRNIE

Project:	Lime Pile Characterization	Excavation Dates:	12/10/97
Project No.:	0848-262-113	Excavation Method:	Backhoe
Client:	LTV Steel - City of Buffalo	Logged / Checked By:	RCH
Location:	South Buffalo	Test Pit Location #:	TP-8

Test Pit Location:

start: 8:37
end: 9:23 (see map)

Test Pit Cross Section:



Depth BGS	Soil Description	Graphic Log	Photos Y / N	Samples Y / N	Comments (Include seepage horizons)
0.0 - 4.0	Lt gray/white f. grained material, (Lime), loose when disturbed, dense, ~6" horizontal layers make up large layer defined by Dark brown crusty material (oxidized lime?) approx every 2' or so, moist				comp sample 8:40
				B-1	VOC sample 8:40
4.0 - 8.0	same A/A, moist				comp sample 8:45
				B-2	VOC sample 8:45
8.0 - 12.0	Same A/A, moist				comp sample, 8:50
				B-3	VOC sample 8:50
12.0 - 16.0	Same A/A				comp sample 8:56
				B-4	VOC sample 8:56
				LF-B	TCLP sample 8:56 w/ oxides and free carbon
16.0 - 20.0	Same A/A				Comp sample 9:09
				B-5	VOC sample 9:09
	15' long 20' deep				

MALCOLM PIRNIE

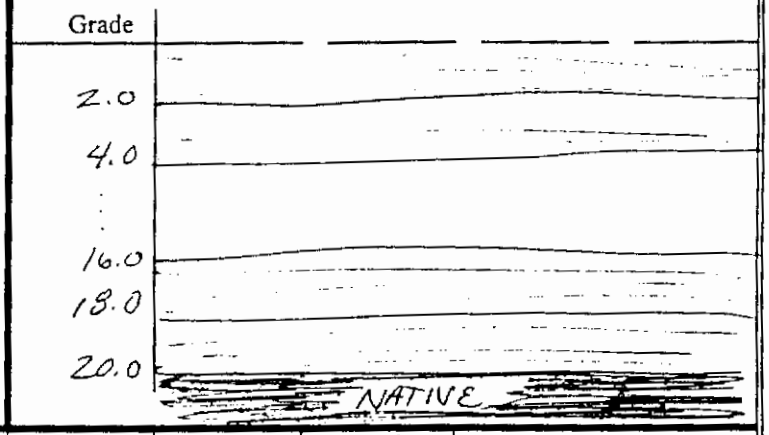
Project:	Lime Pile Characterization	Excavation Dates:	12/10/97
Project No.:	0848-262-163	Excavation Method:	Backhoe
Client:	LTV Steel (City of Buffalo)	Logged / Checked By:	BCH
Location:	South Buffalo	Test Pit Location #:	TP- 9

Test Pit Location:

start: 9:25
end: 9:55

See map

Test Pit Cross Section:



Depth BGS	Soil Description	Graphic Log	Photos Y / N	Samples Y / N	Comments (Include seepage horizons)
0.0 - 4.0	Lt grey/white f. grained material (Lime), ~ 6" horizontal layers make up ~2' larger layers defined by Dk brown f. grained crusty material (oxidized lime?) Loose when disturbed, moist, dense				comp sample: 9:28
4.0 - 8.0	Same A/A				comp sample 9:32
8.0 - 12.0	Same A/A				comp sample 9:35
12.0 - 16.0	Same A/A				comp sample 9:37
16.0 - 20.0	same A/A, wet cattail leaves				comp sample 9:40
	15' long 20' deep				

Sheet ___ of ___

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