INVESTIGATION OF MERCURY SOURCES IN THE PRSA/PRRI AREA

VOLUME III of V

Prepared By:
TIERRA SOLUTIONS, INC.

SEPTEMBER 22, 2003

Table 4: Data Summary for TAL Analytes
Keegan Landfill SIP
July 30-31, 1997

Sample No.	Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium
SD01	3.8	***27.9***	5.3	103	447	1,130	10.8	50.2	74.2
SD02	2.5	11.8	6.8	125	279	879	4.2	***44***	53.8
SD03	ND (12)	2.6	1.3	19.8	R	164	1.1	16	20.8
SD04	***71.5***	17.9	13.9	***229***	588	27,700	1.7	157	84.8
SD05	2.8	***18.9***	4.3	61.7	302	844	7.5	35.3	51.3
SD06	ND (12)	14.6	1.1	10.8	R	92.2	0.3	12.9	13
SD07	23.2	93	***22.2***	***441***	***1,560***	2,250	7.1	468	145
SD08	ND (12)	4.9	1.5	49.2	R	215	0.82	21.7	51.7
SD09	15.9	***31.4***	3.4	***143***	R	518	0.89	43.9	112
SD10	6.6	9.2	8.4	54.9	247	319	1.2	56.2	48.3
SD11	4.7	2.7	8.2	***281***	545	1,330	5	71.1	72.4
SD12	ND (12)	1.8	1.7	35.1	R	282	0.75	24.8	35.7
SD13*	ND (12)	5.4	5.9	44.2	390	754	4	299	59.6
LF01	1.7	14.5	3.3	57	177	463	2.1	27.3	23.1
LF02	4	***60.5***	0.87	28.9	***4,870***	91.4	0.15	13.8	24.3
LF03	***215***	***39.6***	22.4	***118***	443	1,200	3.7	82.3	100
BK01*	3.9	12.1	5.4	34.2	154	522	1.1	24	30.4

Ref. No. 25.

All concentrations are reported in milligrams per kilogram (mg/kg).

Bold italics Indicates that concentration exceeds three times background.

* Samples SD12, SD13, and BK01 are background samples.

ND = Not detected.

R = Rejected data.

( ) = Contract Required Detection Limit.

Table 2

CDM Camp Dresser & McKee

22

Report

Hackensack Meadowlands Development Commission

Preliminary Environmental and Health Impact Statement for the Materials Handling Complex at the Former Keegan Landfill

Kearny, New Jersey

June 1995

CDM Camp Dresser & McKee

environmental services

Raritan Plaza 1, Raritan Center
Edison, New Jersey 08818
Tel: 908 225-7000 Fax: 908 225-7851

June 6, 1995

Mr. Thomas R. Marturano, Chief Engineer
Hackensack Meadowlands Development Commission
One DeKorte Park Plaza
Lyndhurst, NJ 07071-3799

Subject: Final PEHIS for Materials Handling Complex
at the former Keegan Landfill

Dear Mr. Marturano:

Attached please find Camp Dresser & McKee's Final PEHIS for the proposed Materials Handling Complex at the former Keegan Landfill. This report is structured per NJDEP's Solid and Hazardous Waste Management Regulations for preparation of a PEHIS, at NJAC 7:26-2.9(f).

It has been a pleasure assisting HMDC on this project. We would like to express our appreciation to you and the HMDC staff, especially Chris Dour, Ed Konsevick and Ken Scarlatelli, for providing invaluable information and input during the course of the project. Please contact me if I can be of further assistance.

Sincerely,

CAMP DRESSER & McKEE

William E. Cesanek, AICP, P.P.
Project Manager

cc: H. Boucher, CDM
A. Capuzzi, CDM

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Table 2-2
Summary of Analyses for Sediment Samples and Surface Water Samples Taken at the Former Keegan Landfill (April 25, 1989)

Parameter/Unit	Sediment Sample			
	Sed 1	Sed 4	Sed 5	Sed 6
Phenanthrene ug/kg			5,300	4,800
Fluoranthene ug/kg			15,000	4,700
Pyrene ug/kg			9,600	3,500
Benzo (a) anthracene ug/kg			6,900	2,000
Chrysene ug/kg			7,300	2,400
Benzo(b)fluoranthene ug/kg			5,800	2,300
Benzo(k)fluoranthene ug/kg			3,700	1,100
Indeno (1,2,3-cd) pyrene ug/kg			3,200	1,600
Benzo(a)pyrene ug/kg			4,400	2,000
Benzo(g,h,i)perylene ug/kg			2,700	2,000
Aroclor - 1254 ug/kg	2,600 E		1,400E	4,200 E
Aroclor - 1260 ug/kg	2,400 E		1,600 E	
Mercury mg/kg	0.7	2.6	8.7	2.3
Lead mg/kg	305	1,020	1,180	479
Chromium mg/kg	13.3	93.6	114	116
	Surface Water Sample			
Parameter/Unit	SW-5	SW-6, SW-7		
Aluminum ug/L	2170 E	444 E, 467 E		
Barium ug/L	445	211, 212		
Chromium ug/L	21.6 E	4.6*, 4.2*		
Copper ug/L	95.2 E			
Iron ug/L	11,900	2550, 2630		
Lead ug/L	159	43.9, 42.8		
Manganese ug/L	484	224,220		
Mercury ug/L	1.2			
Zinc ug/L	339	45.4, 47.7		

Source: (NUS, 1989)
* - estimated value, compound present below CRDL, but above IDL.
E - estimated value
blank space - compound analyzed for but not detected

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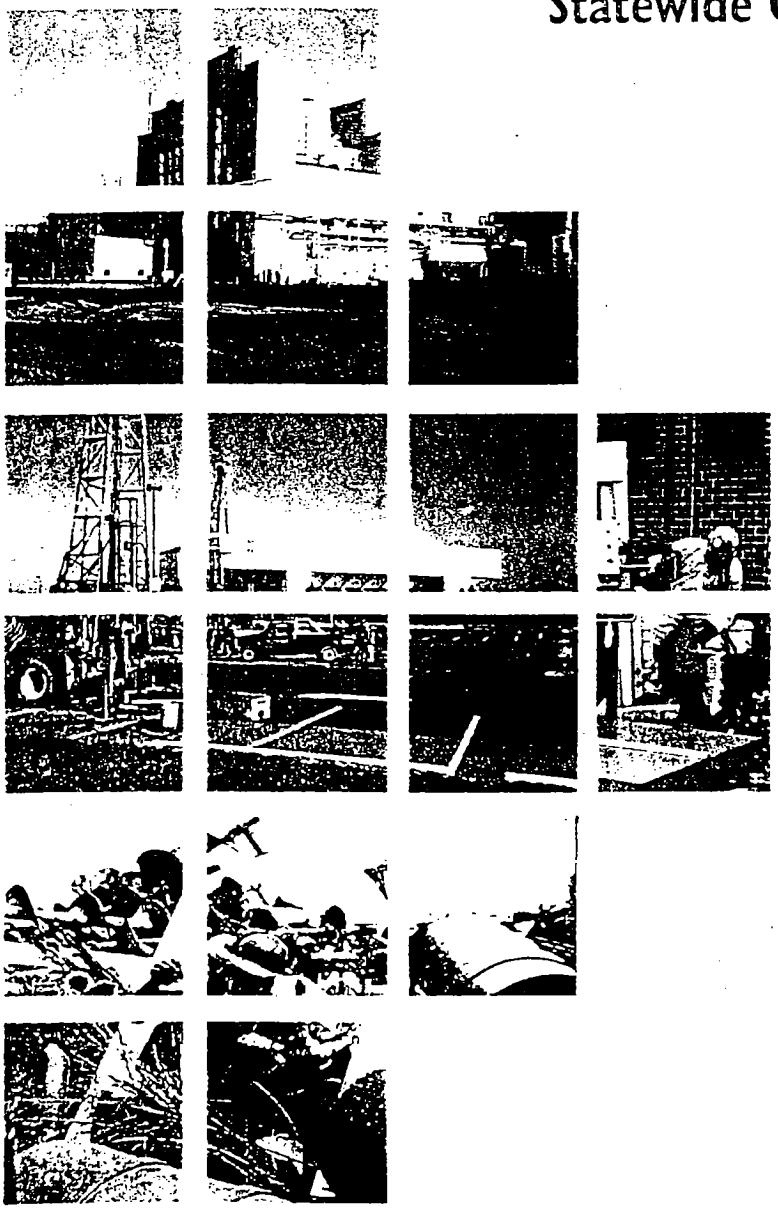
FINAL SUBSURFACE INVESTIGATION RESULTS REPORT

Remedial Investigation and Remedial Action Selection Evaluation Services

Statewide Contract Number A-85149



MSLA 1-D SITE

Kearny, New Jersey

VOLUME I OF II

Submitted to:

STATE OF NEW JERSEY
Department of Environmental Protection
401 East State Street,
Trenton, New Jersey

Submitted by:

The Louis Berger Group, Inc.
30 Vreeland Road
Florham Park, New Jersey 07932

May 2002

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SDG # E77212 – Soil (9/19/00 to 9/27/00)
SDG # E77861 - Soil and Surface Water (9/28/00 to 10/11/00)
SDG # E79715 - Soil (10/30/00)
SDG # E80046 - Soil (11/2/00 and 11/3/00)
SDG # E81463 - Groundwater (11/27/00 to 12/1/00)
SDG # E83022 - Groundwater (12/21/00, 12/28/00)
SDG # E91624 – Groundwater (5/21/01)
SDG #E91760 – Groundwater (5/23/01)
SDG #E91838 – Groundwater (5/24/01)
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mg/kg (applicable SCC is 400 mg/kg) in sample PB20S02. Additionally, four SVOCs were detected just above SCC in samples from PB-14, PB-20, and PB-28. Three (3) PCB compounds were detected just above the SCC in samples from PB-44 and LB-02. Pesticides and VOC compounds were not detected in the soil boring samples above the SCC.

5.3.4 Groundwater Sampling Results

Two (2) groundwater sampling events for the newly installed monitoring wells at the site were implemented including the six (6) shallow and intermediate well couplets (MW-1S and 1D, MW-2S and 2D, MW-3S and 3D, MW-4S and 4D, MW-5S and 5D, MW-6S and 6D), three (3) landfill monitoring wells (MW-7, MW-8, and MW-9) and three (3) deep double-cased monitoring wells (MW-1D2, MW-4D2, and MW-5D2). Groundwater samples were analyzed for compounds listed in Section 4.4.2. Tables 5-5 and 5-6 summarize the laboratory analytical results and compare results to the NJDEP Class II-A Groundwater Quality Standards (GWGS). The following is a discussion of findings associated with the groundwater sampling events.

Shallow Groundwater

Analytical results from the initial round of shallow groundwater sampling primarily indicate the presence of elevated concentrations of Metals and VOC in exceedance of the GWQS. Aluminum, Antimony, Arsenic, Barium, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury and Nickel were detected in exceedance of the GWQS in some or all of the shallow groundwater samples. Based on concentration, the most severe Metals exceedance was Lead, detected at 2,620 ug/l (applicable GWQS is 10 ug/l). VOCs were detected above GWQS in MW-1S, MW-3S and MW-6S. VOC exceedances included Benzene concentrations ranging from 2 ug/l in sample MW-1S to 19 ug/l in sample MW-6S. Chlorobenzene was also detected above the GWQS in samples MW-1S at 9.8 ug/l and MW-6S at 57.1 ug/l.

One shallow groundwater sample (MW-3S) exhibited a Pesticide (alpha-BHC) at 0.1 ug/l, exceeding the GWQS of 0.02 ug/l. Additionally, the presence of SVOCs were revealed in two samples. Bis(2-Exylhexyl)phthalate was detected in sample MW-2S at 32.6 ug/l, and bis(2-Chloroethyl)ether was detected in sample MW-6S at 72.6 ug/l, both above the applicable GWQS.

Analytical results from the confirmatory round of shallow groundwater sampling, conducted in May 2001, are consistent with the initial groundwater sampling event results. Elevated concentrations of Metals and VOC were again found in exceedance of the GWQS. Aluminum, Arsenic, Barium, Cadmium, Chromium, Iron, Lead, Manganese and Nickel were detected in exceedance of the GWQS in some or all of the shallow groundwater samples. Contrary to the results of the initial groundwater sampling event, Antimony, Copper, nor Mercury exceeded the GWQS. Based on concentration, the most severe Metals exceedance was Lead, detected as high as 944 ug/l in the sample collected from MW-4S (applicable GWQS is 10 ug/l). VOCs were detected above GWQS in each shallow groundwater sample. VOC exceedances included Benzene ranging from 4.1 ug/l (MW-4S) to 19 ug/l (MW-3S) and Chlorobenzene ranging from 6.6 ug/l (MW-1S) to 93.5 ug/l (MW-3S).

One shallow groundwater sample from the second groundwater sampling event (MW-3S) exhibited a Pesticide (alpha-BHC) at 0.03 ug/l, exceeding the GWQS of 0.02 ug/l. Contrary to the initial groundwater sampling event, no SVOCs were detected in exceedance of the GWQS.

Landfill Groundwater

Two discrete samples were collected from each landfill monitoring well (MW-7, MW-8 and MW-9) during the initial groundwater sampling event. In accordance with directives from the NJDEP, one sample was collected from the top (MW-7A, MW-8A, and MW-9A) and one sample was collected from the bottom (MW-7B, MW-8B, and MW-9B) of the water column in each of the landfill monitoring wells. Analytical results of these samples do not indicate a significant variation in concentrations of compounds detected in samples collected at different depths within the same water column.

Consistent with shallow groundwater quality along the perimeter of the landfill, groundwater samples collected from the landfill primarily exhibited elevated levels of Metals and VOCs above the GWQS. Aluminum, Arsenic, Chromium, Iron, Lead, Manganese and Nickel were detected in exceedance of the GWQS in some or all of the landfill groundwater samples. Benzene and Chlorobenzene were among VOCs detected above the GWQS in each of the samples. Toluene and Xylenes were also detected above GWQS in MW-8A at concentrations of 1,100 ug/l and 335 ug/l respectively. Acetone was detected in samples MW-9A (3,530 ug/l) and MW-9B (7,660 ug/l).

Additionally, three landfill groundwater samples (MW-7A, MW-7B and MW-9B) exhibited the presence of SVOCs in exceedance of the GWQS. Bis(2-Exylhexyl)phthalate was detected in sample MW-7A and MW-7B at 57.5 ug/l and 125 ug/l respectively and phenol was detected in sample MW-9B at 5,310 ug/l.

Analytical results associated with the second round of landfill groundwater sampling confirm the results of the initial landfill groundwater sampling event. Because the results of the initial event did not indicate a significant contaminant gradient between samples collected from different depths within the same water column, just one sample was collected from each landfill well during the second event. The results of the second sampling round exhibit the presence of Aluminum, Arsenic, Chromium, Iron, Lead, Manganese, Mercury, and Nickel above the GWQS in some or all of the landfill groundwater samples. Two VOCs, Benzene and Chlorobenzene, exceeded the GWQS in two of the samples (MW-7 and MW-8). No other VOCs were detected above the GWQS during the second landfill groundwater sampling round. Additionally, no SVOCs, Pesticides, or PCBs were found above the GWQS.

Intermediate Groundwater

Analytical results from the initial round of intermediate groundwater sampling exhibit the presence of elevated concentrations of Metals in exceedance of the GWQS. Aluminum, Arsenic, Chromium, Iron, Lead, Manganese and Mercury were detected in exceedance of the GWQS in some or all of the intermediate groundwater samples. Based on concentration, the most severe

New Jersey Department of Environmental Protection

MSLA 1-D Landfill Site, Kearny, NJ

Analytical Results - Test Pit Sampling

SAMPLE ID	DUP-02	TP08	TP09	TP10	TP15	TP17	TP18	TP19	TP20	TP21	TP24	TP25	TP26	NJ Residential Soil Cleanup Criteria (NJAC 7:26D 5/99)	NJ Non-residential Soil Cleanup Criteria (NJAC 7:26D 5/99)	NJ Impact to Groundwater Soil Cleanup Criteria (NJAC
LAB ID	E76140-4	E75869-10	E75869-11	E75869-12	E75869-15	E75869-13	E75869-16	E75869-17	E75869-18	E75869-19	E76140-1	E76140-2	E76140-3			
DATE	5-Sep-00	30-Aug-00	31-Aug-00	31-Aug-00	31-Aug-00	31-Aug-00	1-Sep-00	1-Sep-00	1-Sep-00	1-Sep-00	5-Sep-00	5-Sep-00	5-Sep-00			
Metals (mg/kg)																
Aluminum	11300	25700	10300	15100	4590	13400	8420	7650	9280	5490	7510	7640	9880	NS	NS	NS
Antimony	6.1 J	44.1 J	5.1 J	2 J	9.4 J	7.7 J	1.2 J	2 J	4 J	2.5 J	ND (0.47)	2.7 J	5.2 J	14	340	NS
Arsenic	5.9	16.2	7.6	8.1	3.6 J	5.6	6.8	8.4	14.5	6.7	10.2	18	6.6	20	20	NS
Barium	230	707	161	353	205	390	449	199	393	835	140	251	163	700	47,000	NS
Beryllium	0.62 J	7.1	0.56 J	0.3 J	0.53 J	0.14 J	0.49 J	0.51 J	0.62 J	0.36 J	0.7 J	0.47 J	0.55 J	2	2	NS
Cadmium	2.2	8.1	6	3.7	1.7 J	10.4	2.3	1.8	3	2.1	1.4 J	3.3	1.9	39	100	NS
Calcium	8840 J	14800	16100	25800	13100	23500	19600	3200	12100	26900	5210 J	11900 J	5850 J	NS	NS	NS
Chromium	30.2	148 J	98.4 J	52.6 J	33.4 J	93.1 J	32.1 J	37.9 J	53.6 J	58.9 J	99.9	143	32.7	120,000	NS	NS
Cobalt	7.9 J	15.8	7.8 J	6.5 J	4.1 J	11.5 J	6.7 J	7.1 J	9.1 J	6.2 J	7.2 J	8.6 J	9.0 J	NS	NS	NS
Copper	89.5	4990 J	241 J	106 J	351 J	373 J	165 J	172 J	210 J	225 J	120	253	117	600	600	NS
Iron	21500	36100	46200	51800	19900	52200	19900	23200	64000	19900	18000	40200	26000	NS	NS	NS
Lead	479	4830	467	528	448	911	545	342	945	667	130	531	395	400	600	NS
Magnesium	4340	3920	3440	3550	2590	2350	5900	2460	12300	2360	3880	3180	4000	NS	NS	NS
Manganese	604 J	628	455	785	300	277	402	335	725	278	290.0 J	491 J	447 J	NS	NS	NS
Mercury	0.34 J	2.6 J	3 J	0.86 J	1.2 J	0.98 J	0.69 J	4.0 J	2.1 J	0.56 J	6.9 J	19.7 J	4.4 J	14	270	NS
Nickel	28.4	434	88.7	24.2	40.9	157	34.2	54.2	162	64.5	28.3	41.1	30.2	250	2400	NS
Potassium	1590	1050 J	626 J	710 J	843 J	379 J	1380 J	1410 J	2190 J	753 J	1840	1550	1390	NS	NS	NS
Selenium	ND (0.76)	3.7	1.8	2.1	1.6 J	3.3	ND (1.2)	1.8	2.3	0.94 J	ND (0.86)	ND (0.91)	ND (0.77)	63	3100	NS
Silver	2.4 J	4.4	0.89 J	5	0.57 J	0.93 J	0.71 J	0.61 J	10.4	0.44 J	0.88 J	2.3 J	0.79 J	110	4100	NS
Sodium	866 J	724 J	274 J	285 J	436 J	540 J	902 J	783 J	4010	343 J	493 J	1250 J	695 J	NS	NS	NS
Thallium	ND (0.89)	ND (1.4)	ND (1.7)	ND (2.1)	ND (2.0)	ND (1.8)	ND (1.7)	ND (1.5)	ND (2.2)	ND (1.3)	ND (1.0)	ND (1.1)	ND (0.89)	2	2	NS
Vanadium	27.9	49.6	64.2	26.5	13.7 J	49.8	25.2	24.3	15.6 J	27.7	25.7	33.9	30.4	370	7100	NS
Zinc	1330 J	12600	1250	1930	1970	2040	636	429	2590	936	344 J	1040 J	499 J	1500	1500	NS
Cyanide	ND (0.09)	0.38 J	0.26 J	0.4 J	ND (0.16)	ND (0.14)	0.23 J	ND (0.11)	0.25 J	0.24 J	ND (0.1)	ND (0.11)	ND (0.09)	1100	21000	NS
General Chemistry																
Chromium, Hexavalent (mg/kg)	ND (1.08)	ND (1.27)	ND (1.5)	ND (1.86)	ND (1.82)	ND (1.64)	ND (1.51)	ND (1.33)	ND (1.94)	ND (1.16)	ND (1.22)	1.5 J	ND (1.09)	240	6100	NS
Solids, Percent (%)	81.1	69.5	58.8	47.4	48.3	53.8	58.3	66.1	45.3	75.6	72.3	68.1	80.8	NS	NS	NS
pH (su)	7.6	7.8	7.2	7.2	7.2	7.4	8.2	7.8	9	8.1	7.9	7.9	7.5	NS	NS	NS

NOTES

- Bold values represent detection of compounds below New Jersey Combined (Most Stringent) Soil Cleanup Criteria (N.J.A.C. 7:26D 5/99).
- Shaded values meet or exceed New Jersey Combined (Most Stringent) Soil Cleanup Criteria (N.J.A.C 7:26D 5/99) or New Jersey Hazardous Waste Regulatory levels for Toxicity Characteristics for TCLP analysis.
- J = Estimated value.
- ND = Not detected above the Contact Required Quantitation Limit (CRQL).
- NS = NJDEP SCC not listed for this compound.
- TIC = Tentatively Indentified Compounds.

Analytical Results - Soil Boring Sampling

SAMPLE ID	LB0170	LB0235	LB-03	LB-04	PB0208	PB0241	PB06-37	PB1406	PB1430	PB20502	PB20D34	PB2807	PB2840	PB3402	PB3440	PB4406	PB4446	NJ Residential Soil Cleanup Criteria (NJAC 7:26D 5/99)	NJ Non-Residential Soil Cleanup Criteria (NJAC 7:26D 5/99)	NJ Impact To Ground water Soil Cleanup Criteria (NJAC 7:26D 5/99)
LAB ID	E7861-5	E77212-7	E77212-3	E77212-4	E76312-11	E76312-12	E7861-6	E80046-1	E80046-2	E77212-1	E77212-2	E77212-5	E77212-6	E77212-8	E7861-4	E79715-2	E79715-1			
DATE	4-Oct-00	27-Sep-00	21-Sep-00	21-Sep-00	13-Sep-00	14-Sep-00	11-Oct-00	2-Nov-00	2-Nov-00	19-Sep-00	19-Sep-00	22-Sep-00	25-Sep-00	27-Sep-00	28-Sep-00	30-Oct-00	30-Oct-00			
Heptachlor	ND (2)	ND (2.3)	ND (2.2)	ND (2.1)	ND (2.6)	ND (2.1)	ND (2.1)	ND (2)	ND (2.1)	ND (1.9)	ND (2.2)	ND (2.2)	ND (2.1)	ND (2)	ND (2.1)	ND (2.1)	ND (2)	0.15	0.65	50
Aldrin	ND (2)	ND (2.3)	ND (2.2)	ND (2.1)	ND (2.6)	ND (2.1)	ND (2.1)	ND (2)	ND (2.1)	ND (1.9)	ND (2.2)	ND (2.2)	ND (2.1)	ND (2)	ND (2.1)	ND (2.1)	ND (2)	0.04	0.17	50
Heptachlor epoxide	ND (2)	ND (2.3)	ND (2.2)	ND (2.1)	ND (2.6)	ND (2.1)	ND (2.1)	ND (2)	ND (2.1)	ND (1.9)	ND (2.2)	ND (2.2)	ND (2.1)	ND (2)	ND (2.1)	ND (2.1)	ND (2)	0.15	0.65	50
Endosulfan-I	ND (2)	ND (2.3)	ND (2.2)	ND (2.1)	ND (2.6)	ND (2.1)	ND (2.1)	ND (2)	ND (2.1)	ND (1.9)	ND (2.2)	ND (2.2)	ND (2.1)	ND (2)	ND (2.1)	ND (2.1)	ND (2)	340	6200	50
Dieldrin	ND (4.1)	ND (4.7)	**7.1 J**	ND (4.2)	ND (5.2)	ND (4.3)	ND (4.3)	ND (4.1)	ND (4.2)	ND (3.9)	ND (4.4)	ND (4.4)	ND (4.1)	ND (3.9)	ND (4.3)	ND (4.2)	ND (4.1)	0.042	0.18	50
4,4'-DDE	ND (4.1)	ND (4.7)	**6.5 J**	**10 J**	ND (5.2)	ND (4.3)	ND (4.3)	ND (4.1)	ND (4.2)	ND (3.9)	ND (4.4)	ND (4.4)	ND (4.1)	ND (3.9)	ND (4.3)	ND (4.2)	ND (4.1)	2	9	50
Endrin	ND (4.1)	ND (4.7)	ND (4.5)	ND (4.2)	ND (5.2)	ND (4.3)	ND (4.3)	ND (4.1)	ND (4.2)	ND (3.9)	ND (4.4)	ND (4.4)	ND (4.1)	ND (3.9)	ND (4.3)	ND (4.2)	ND (4.1)	17	310	50
Endosulfan-II	ND (4.1)	ND (4.7)	ND (4.5)	ND (4.2)	ND (5.2)	ND (4.3)	ND (4.3)	ND (4.1)	ND (4.2)	ND (3.9)	ND (4.4)	27	ND (4.1)	ND (3.9)	ND (4.3)	ND (4.2)	ND (4.1)	340	6200	50
4,4'-DDD	ND (4.1)	ND (4.7)	**9.9**	ND (4.2)	ND (5.2)	ND (4.3)	ND (4.3)	**13**	ND (4.2)	**5.9**	ND (4.4)	**17**	ND (4.1)	ND (3.9)	ND (4.3)	ND (4.2)	ND (4.1)	3	12	50
Endosulfan sulfate	ND (4.1)	ND (4.7)	ND (4.5)	ND (4.2)	ND (5.2)	ND (4.3)	ND (4.3)	ND (4.1)	ND (4.2)	ND (3.9)	ND (4.4)	ND (4.4)	ND (4.1)	ND (3.9)	ND (4.3)	ND (4.2)	ND (4.1)	NS	NS	NS
4,4'-DDT	ND (4.1)	ND (4.7)	ND (4.5)	ND (4.2)	ND (5.2)	ND (4.3)	ND (4.3)	**4.6 J**	ND (4.2)	ND (3.9)	ND (4.4)	**5.4**	ND (4.1)	ND (3.9)	ND (4.3)	ND (4.2)	ND (4.1)	2	9	500
Methoxychlor	ND (20)	ND (23)	ND (22)	**51 J**	ND (26)	ND (21)	ND (21)	ND (20)	ND (21)	ND (19)	ND (22)	ND (22)	ND (21)	ND (20)	ND (21)	ND (21)	ND (20)	280	5200	50
Endrin ketone	ND (4.1)	ND (4.7)	ND (4.5)	ND (4.2)	ND (5.2)	ND (4.3)	ND (4.3)	ND (4.1)	ND (4.2)	ND (3.9)	ND (4.4)	ND (4.4)	ND (4.1)	ND (3.9)	ND (4.3)	ND (4.2)	ND (4.1)	NS	NS	NS
Endrin aldehyde	ND (4.1)	ND (4.7)	ND (4.5)	ND (4.2)	ND (5.2)	ND (4.3)	ND (4.3)	ND (4.1)	ND (4.2)	ND (3.9)	ND (4.4)	ND (4.4)	ND (4.1)	ND (3.9)	ND (4.3)	ND (4.2)	ND (4.1)	NS	NS	NS
alpha-Chlordane	ND (2)	ND (2.3)	ND (2.2)	ND (2.1)	ND (2.6)	ND (2.1)	ND (2.1)	ND (2)	ND (2.1)	ND (1.9)	ND (2.2)	ND (2.2)	ND (2.1)	**3.9 J**	ND (2.1)	ND (2.1)	ND (2)	NS	NS	NS
gamma-Chlordane	ND (2)	ND (2.3)	ND (2.2)	ND (2.1)	ND (2.6)	ND (2.1)	ND (2.1)	ND (2)	ND (2.1)	ND (1.9)	ND (2.2)	ND (2.2)	ND (2.1)	**6**	ND (2.1)	ND (2.1)	ND (2)	NS	NS	NS
Toxaphene	ND (200)	ND (230)	ND (220)	ND (210)	ND (260)	ND (210)	ND (210)	ND (200)	ND (210)	ND (190)	ND (220)	ND (220)	ND (210)	ND (200)	ND (210)	ND (210)	ND (200)	0.1	0.2	50
Polychlorinated Biphenyls (PCBs) (ug/kg)																				
Aroclor 1016	ND (41)	ND (47)	ND (45)	ND (42)	ND (52)	ND (43)	ND (43)	ND (41)	ND (42)	ND (39)	ND (44)	ND (44)	ND (41)	ND (39)	ND (43)	ND (42)	ND (41)	0.49	2	50
Aroclor 1221	ND (82)	ND (94)	ND (90)	ND (85)	ND (100)	ND (86)	ND (86)	ND (81)	ND (84)	ND (77)	ND (88)	ND (88)	ND (83)	ND (78)	ND (85)	ND (84)	ND (81)	0.49	2	50
Aroclor 1232	ND (41)	ND (47)	ND (45)	ND (42)	ND (52)	ND (43)	ND (43)	ND (41)	ND (42)	ND (39)	ND (44)	ND (44)	ND (41)	ND (39)	ND (43)	ND (42)	ND (41)	0.49	2	50
Aroclor 1242	**150**	**1400**	ND (45)	ND (42)	ND (52)	ND (43)	ND (43)	ND (41)	ND (42)	ND (39)	ND (44)	ND (44)	ND (41)	ND (39)	ND (43)	ND (42)	ND (41)	0.49	2	50
Aroclor 1248	ND (41)	ND (47)	ND (45)	ND (42)	**3400**	ND (43)	ND (43)	ND (41)	ND (42)	ND (39)	ND (44)	ND (44)	ND (41)	ND (39)	ND (43)	**1700**	ND (41)	0.49	2	50
Aroclor 1254	**130**	**780**	ND (45)	ND (42)	**3700**	ND (43)	ND (43)	**300 J**	ND (42)	ND (39)	ND (44)	ND (44)	ND (41)	ND (39)	ND (43)	**1200**	ND (41)	0.49	2	50
Aroclor 1260	ND (41)	**220**	ND (45)	ND (42)	ND (52)	ND (43)	ND (43)	**190 J**	ND (42)	ND (39)	ND (44)	ND (44)	ND (41)	ND (39)	ND (43)	**900 J**	ND (41)	0.49	2	50
Metals (mg/kg)																				
Aluminum	5530	5210	7730	4830	11700	10200	9860	8390	3890	23200	19300	7400	9870	7780	7160	6900	3310	NS	NS	NS
Antimony	3.7 J	17.2 J	5.1 J	2.8 J	11.1 J	ND (0.43)	ND (0.45)	1.6 J	ND (1.3)	43.8 J	ND (0.43)	2.4 J	ND (0.41)	1 J	0.44 J	4.7 J	0.58 J	14	340	NS
Arsenic	3.3	12.4	8.3	3.9	7	1.6 J	1.4 J	7.7 J	1.3 J	8.3	7.6	6	4.7	5.2	1.9 J	6.1	ND (0.52)	20	20	NS
Barium	209	**1000**	378	358	**780**	30 J	53.7	142	19.7 J	839	114	191	49.5	40.7 J	31.8 J	338	6.2 J	700	47000	NS
Beryllium	0.19 J	0.32 J	0.51 J	0.16 J	**3.8**	0.48 J	0.57 J	0.51 J	0.26 J	1.3	0.93 J	0.37 J	0.53 J	0.26 J	0.43 J	0.38 J	0.15 J	2	2	NS
Cadmium	2.8	**119**	1.8	1 J	16.4	ND (0.08)	ND (0.08)	1.3	ND (0.23)	5.9	ND (0.08)	1.2 J	ND (0.07)	0.23 J	ND (0.07)	6.2	ND (0.07)	39	100	NS
Calcium	31100	24100	17600	27200	31600 J	7080 J	5700	3140	1490	45400	7910	6870	8070	2440	7750	8430	1220	NS	NS	NS
Chromium	54.6	109	36.9	25.2	111	16.8	17.3	27.6	9.8	111	28.4	48.2	16.5	18.5	12.4	61	9.2	120,000	NS	NS
Cobalt	4.6 J	16.6	5.1 J	3.9 J	15.1 J	9.1 J	8.8 J	10.7	4.8 J	5 J	14.9	6.9 J	9.3 J	5.5 J	6.7 J	11.2 J	3 J	NS	NS	NS
Copper	**903**	**4860**	201	123	**12100**	18.8	19.3	155 J	54 J	180	29.2	149	20.5	40.3	11.7	**1020**	6.2	600	600	NS
Iron	26500	122000	19000	14100	35900	23400	20300	26400	8790	30100	35700	21100	22500	31900	19600	40200	7890	NS	NS	NS
Lead	345 J	**1620**	**541**	**401**	**1940**	7.5	16 J	**444 J**	13.4 J	**2990**	13.6	395	11.7	63.8	7 J	**603 J**	2.9 J	400	600	NS
Magnesium	3220	7050	3860	3910	5360	6650	6260	2130	2110	6580	10000	3020	6570	2250	5610	4140	1490	NS	NS	NS
Manganese	255 J	448	360	197	704	575	383 J	484	67.9	3710	658	310	427	199	444 J	350	41.9	NS	NS	NS
Mercury	1.6	2.2	1.1	1.3	**19.4**	ND (0.05)	ND (0.05)	0.98	0.08 J	0.63	ND (0.05)	0.39	0.05 J	0.08 J	ND (0.05)	2.5	ND (0.05)	14	270	NS
Nickel	43.8	**298**	61.1	21.4	**295**	17.2	17	32.6	8 J	21.2	30.6	18.8	18.8	16.9	13.9	92.9	6 J	250	2400	NS
Potassium	1080 J	941 J	1140 J	931 J	964 J	2020	1860	1150	687 J	1870	3670	1190	1690	829 J	1260	953 J	411 J	NS	NS	NS
Selenium	1.7	4.1	ND (0.82)	ND (0.86)	2.1	ND (0.78)	ND (0.81)	ND (0.79)	ND (1.0)	2	ND (0.78)	ND (0.72)	ND (0.75)	ND (0.69)	ND (0.7)	2.3	ND (0.7)	63	3100	NS
Silver	1.3 J	2.1 J	0.91 J	0.53 J	2.8 J	ND (0.18)	ND (0.18)	0.49 J	ND (0.41)	4.6	ND (0.18)	0.64 J	ND (0.17)	ND (0.16)	ND (0.16)	3.9	ND (0.16)	110	4100	NS
Sodium	4920	2410	2340	2360	613 J	602 J	572 J	196 J	473 J	1680	1090 J	305 J	450 J	300 J	507 J	449 J	333 J	NS	NS	NS
Thallium	ND (0.82)	ND (1.0)	ND (0.96)	ND (1.0)	ND (1.1)	ND (0.91)	ND (0.94)	ND (1.7)	ND (2.1)	ND (0.8)	1.2 J	ND (0.84)	ND (0.87)	ND (0.8)	ND (0.82)	ND (0.87)	ND (0.81)	2	2	NS
Vanadium	10.3 J	12.6 J	19.2	12.6 J	27	26.2	25	30.8	15.9	41.1	41.5	30.5	22.4	23.2	17.2	20.8	14.5	370	7100	NS
Zinc	1130	**3980**	732	562	**11500**	39.7	48.5	367	20.7	**1980**	69.2	468	52.9	78.8	37.1	1170 J	16.1 J	1500	1500	NS
Cyanide	ND (0.09)	ND (0.11)	0.18 J	ND (0.1)	0.37 J	ND (0.09)	ND (0.09)	0.69	ND (0.09)	ND (0.09)	ND (0.1)	0.13 J	ND (0.09)	ND (0.09)	ND (0.09)	0.16 J	ND (0.09)	1100	21000	NS
Chromium, Hexavalent	ND (0.418)	ND (1.27)	ND (1.18)	ND (1.16)	ND (1.35)	ND (1.11)	0.5 J	ND (0.424)	ND (0.454)	ND (1.03)	ND (1.19)	ND (1.09)	ND (1.1)	ND (1.06)	ND (0.44)	ND (0.45)	ND (0.44)	240	6100	NS
General Chemistry																				
pH (su)	7.7	8.6	8.5	8.4	8.1	7.8	7.6	7.4	8.7	7.8	7.8	7.6	7.6	7.5	7.9	7.7	8.4	NS	NS	NS
Solids (%)	86.2	69.1	74.5	76	65.3	79.2	80.3	85	79.2	85.2	73.9	80.5	80.3	83.3	81.6	79.7	82	NS	NS	NS

NOTES

- Bold values represent detection of compounds below New Jersey Combined (Most Stringent) Soil Cleanup Criteria (N.J.A.C. 7:26D 5/99).
- Shaded values meet or exceed New Jersey Combined (Most Stringent) Soil Cleanup Criteria (N.J.A.C 7:26D 5/99).
- ND = Not detected above the Contact Required Quantitation Limit (CRQL).
- NS = NJDEP SCC not listed for this compound.
- TIC = Tentatively Indentified Compounds.
- J = Estimated value.

Table 5-6

New Jersey Department of Environmental Protection

MSLA 1-D Landfill Site, Kearny, NJ

Analytical Results - Groundwater Sampling - Second Round

SAMPLE ID	DUP	GB	MW-1D	MW-1D2	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S	MW-4D	MW-4D2	MW-4S	MW-5S	MW-5D	MW-5D2	MW-6D	MW-6S	MW-7	MW-8	MW-9	NJ Groundwater Quality Standards
LAB ID	E91838-7	E91838-4	E91760-3	E91760-1	E91760-2	E91925-5	E91925-4	E91925-8	E91925-7	E91838-3	E91838-2	E91838-1	E91624-2	E91624-3	E91624-1	E91925-3	E91925-2	E91760-5	E91760-6	E91760-7	
DATE	24-May-01	24-May-01	23-May-01	23-May-01	23-May-01	25-May-01	25-May-01	25-May-01	25-May-01	24-May-01	24-May-01	24-May-01	21-May-01	21-May-01	21-May-01	25-May-01	25-May-01	23-May-01	23-May-01	23-May-01	
4,4'-DDD	ND (0.02)	ND (0.02)	NT	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.02)	NT	NT	NT	ND (0.022)	NT	NT	NT	0.1
4,4'-DDE	ND (0.02)	ND (0.02)	NT	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.02)	NT	NT	NT	ND (0.022)	NT	NT	NT	0.1
4,4'-DDT	ND (0.02)	ND (0.02)	NT	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.02)	NT	NT	NT	ND (0.022)	NT	NT	NT	0.1
Endrin	ND (0.02)	ND (0.02)	NT	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.02)	NT	NT	NT	ND (0.022)	NT	NT	NT	2
Endosulfan sulfate	ND (0.02)	ND (0.02)	NT	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.02)	NT	NT	NT	ND (0.022)	NT	NT	NT	0.4
Endrin aldehyde	ND (0.02)	ND (0.02)	NT	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.02)	NT	NT	NT	ND (0.022)	NT	NT	NT	NS
Endosulfan-I	ND (0.02)	ND (0.02)	NT	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.02)	NT	NT	NT	ND (0.022)	NT	NT	NT	0.4
Endosulfan-II	ND (0.02)	ND (0.02)	NT	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.02)	NT	NT	NT	ND (0.022)	NT	NT	NT	0.4
Heptachlor	ND (0.02)	ND (0.02)	NT	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.022)	NT	ND (0.02)	NT	0.084	NT	NT	NT	ND (0.022)	NT	NT	NT	0.4
Heptachlor epoxide	ND (0.02)	ND (0.02)	NT	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.022)	NT	ND (0.02)	NT	ND (0.02)	NT	NT	NT	ND (0.022)	NT	NT	NT	0.2
Methoxychlor	ND (0.05)	ND (0.05)	NT	NT	ND (0.055)	NT	ND (0.05)	NT	ND (0.055)	NT	ND (0.05)	NT	ND (0.06)	NT	NT	NT	ND (0.055)	NT	NT	NT	40
Toxaphene	ND (0.25)	ND (0.25)	NT	NT	ND (0.28)	NT	ND (0.25)	NT	ND (0.28)	NT	ND (0.25)	NT	ND (0.28)	NT	NT	NT	ND (0.28)	NT	NT	NT	3
PCBs (ug/l)																					
Aroclor 1016	ND (0.5)	ND (0.5)	NT	NT	ND (0.5)	NT	ND (0.5)	NT	ND (0.55)	NT	ND (0.5)	NT	ND (0.5)	NT	NT	NT	ND (0.55)	NT	NT	NT	0.5
Aroclor 1221	ND (0.5)	ND (0.5)	NT	NT	ND (0.5)	NT	ND (0.5)	NT	ND (0.55)	NT	ND (0.5)	NT	ND (0.5)	NT	NT	NT	ND (0.55)	NT	NT	NT	0.5
Aroclor 1232	ND (0.5)	ND (0.5)	NT	NT	ND (0.5)	NT	ND (0.5)	NT	ND (0.55)	NT	ND (0.5)	NT	ND (0.5)	NT	NT	NT	ND (0.55)	NT	NT	NT	0.5
Aroclor 1242	ND (0.5)	ND (0.5)	NT	NT	ND (0.5)	NT	ND (0.5)	NT	ND (0.55)	NT	ND (0.5)	NT	ND (0.5)	NT	NT	NT	ND (0.55)	NT	NT	NT	0.5
Aroclor 1248	ND (0.5)	ND (0.5)	NT	NT	ND (0.5)	NT	ND (0.5)	NT	ND (0.55)	NT	ND (0.5)	NT	ND (0.5)	NT	NT	NT	ND (0.55)	NT	NT	NT	0.5
Aroclor 1254	ND (0.5)	ND (0.5)	NT	NT	ND (0.5)	NT	ND (0.5)	NT	ND (0.55)	NT	ND (0.5)	NT	ND (0.5)	NT	NT	NT	ND (0.55)	NT	NT	NT	0.5
Aroclor 1260	ND (0.5)	ND (0.5)	NT	NT	ND (0.5)	NT	ND (0.5)	NT	ND (0.55)	NT	ND (0.5)	NT	ND (0.5)	NT	NT	NT	ND (0.55)	NT	NT	NT	0.5
Metals (Unfiltered) (ug/l)																					
Aluminum	5940	ND (200)	4220	ND (200)	4880	1460	ND (200)	4680	5780	14400	ND (200)	13700	419	799	792	840	243	ND (200)	ND (200)	660	200
Antimony	ND (5)	ND (5)	ND (5)	5.7	5.9	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	9.5	ND (5)	17.1	ND (5)	ND (5)	7.4	10.6	10.2	19.7	ND (10)	20
Arsenic	7.2	ND (5)	50.1	ND (5)	5.2	8.5	ND (5)	11.6	5.8	26.2	ND (5)	18.4	10.1	12.9	ND (5)	ND (5)	ND (5)	26.8	6.4	41.8	8
Barium	2440	ND (200)	1240	ND (200)	1870	ND (200)	690	245	444	353	ND (200)	3350	436	453	ND (200)	336	319	860	1220	1570	2000
Beryllium	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5.0)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	20
Boron	8050	ND (100)	4530	665	6860	1700	6480	2200	6030	166	278	7820	11600	9770	268	3090	4310	20700	13600	22800	NS
Cadmium	5.2	ND (4)	ND (4)	ND (4)	4.9	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	12.8	ND (4.0)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	4
Calcium	82300	17000	195000	81700	213000	188000	66700	131000	96800	289000	244000	92200	71100	114000	702000	220000	149000	26000	41600	32600	NS
Chromium	162	ND (10)	60.8	ND (10)	42.2	14.4	28.9	23.6	31.4	21.9	19.4	224	202	152	ND (10)	17.4	ND (10)	338	65.6	593	100
Cobalt	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	62.6	ND (50)	ND (50)	NS
Copper	218	ND (25)	ND (25)	ND (25)	970	ND (25)	ND (25)	ND (25)	84.9	36.4	ND (25)	496	64.3	ND (25)	ND (25)	ND (25)	175	ND (25)	ND (25)	42.9	1000
Iron	96900	ND (100)	108000	462	32800	12800	43500	15300	38800	25200	133	144000	11600	16400	952	14800	2150	6380	3560	18000	300
Lead	468	ND (3)	8.2	ND (3)	767	15.9	37.5	19.5	186	18.4	ND (3)	944	35.2	12.1	ND (3)	12.8	61.5	9.6	6.4	56100	10
Magnesium	51400	ND (5000)	187000	63500	60400	126000	58200	58200	86100	91600	42500	52300	81300	132000	106000	275000	61400	60600	70900	24500	NS
Manganese	401	ND (15)	2740	804	1160	917	197	1160	472	3420	139	697	237	2050	807	1160	218	24.2	53.9	382	50
Mercury	0.48	ND (0.2)	ND (0.2)	ND (0.2)	0.44	ND (0.2)	0.2	0.33	0.44	ND (0.2)	ND (0.2)	1.2	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	0.26	ND (0.2)	ND (0.2)	0.5	2
Nickel	147	ND (40)	ND (40)	ND (40)	65	ND (40)	ND (40)	ND (40)	55.8	ND (40)	ND (40)	215	455	80	ND (40)	ND (40)	111	242	99.8	364	100
Potassium	285000	ND (5000)	198000	31900	63900	80700	188000	79800	193000	112000	47400	274000	504000	316000	7090	155000	145000	824000	294000	1060000	NS
Selenium	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	7.6	ND (5)	ND (5)	ND (5)	ND (5)	5.6	ND (5)	9.8	6.4	5.3	10.1	ND (5)	9.2	50
Silver	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10.0)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	NS
Sodium	945000	20800	1360000	396000	204000	793000	580000	567000	563000	763000	122000	921000	1780000	1580000	560000	1700000	482000	5020000	1160000	4920000	50000
Thallium	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10.0)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (30)	ND (20)	10
Tin	148	ND (10)	14.2	ND (10)	84.3	ND (10)	18.4	ND (10)	31	ND (10)	ND (10)	230	181	24.8	ND (10)	ND (10)	ND (10)	1110	37.3	874	NS
Vanadium	ND (50)	ND (50)	71.2	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	61	76.9	222	ND (50)	ND (50)	ND (50)	64.7	ND (50)	135	NS
Zinc	1860	ND (20)	90.1	79.7	3030	61.8	66.8	70.5	654	70.1	ND (20)	3280	80	73.6	21	43.2	578	101	399	793	5000
Metals (Filtered) (ug/l)																					
Aluminum	221	NT	ND (200)	204	ND (200)	ND (200)	ND (200)	ND (200)	ND (200)	ND (200)	ND (200)	204	327	220	ND (200)	ND (200)	ND (200)	ND (200)	ND (200)	326	200
Antimony	ND (5)	NT	ND (5)	5.5	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	5.5	15.2	ND (5)	ND (5)	ND (5)	ND (5)	9.8	ND (5)	13.4	20
Arsenic	ND (5)	NT	24.5	ND (5)	ND (5)	5.8	ND (5)	8.9	ND (5)	7.9	ND (5)	9.9	13.4	7.8	ND (5)	ND (5)	ND (5)	24.2	ND (5)	43.1	8
Barium	822	NT	918	ND (200)	1480	ND (200)	635	ND (200)	352	264	ND (200)	902	438	415	ND (200)	306	308	843	1230	1940	2000
Beryllium	ND (5)	NT	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	20
Boron	8650	NT	4350	670	6840	1750	6560	2100	5950	118	270	8360	11600	9590	278	3160	4240	20100	13500	24400	NS

Table 5-7

New Jersey Department of Environmental Protection

MSLA 1-D Landfill Site, Kearny, NJ

Analytical Results - Surface Water Sampling

SAMPLE ID	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	DUP-01	DUP-02	New Jersey Surface Water Quality Criteria
LAB ID	E76312-15	E76140-5	E75869-5	E75869-3	E75869-1	E76140-7	E76140-9	E76312-6	E76312-8	E76312-4	E75815-7	E75862-7	
DATE	7-Sep-00	6-Sep-00	30-Aug-00	30-Aug-00	30-Aug-00	6-Sep-00	6-Sep-00	7-Sep-00	8-Sep-00	7-Sep-00	29-Aug-00	30-Aug-00	
Aldrin	ND (0.05)	ND (0.051)	ND (0.05)	ND (0.05)	ND (0.051)	ND (0.051)	ND (0.051)	ND (0.051)	ND (0.05)	ND (0.051)	ND (0.05)	NT	0.00013
Heptachlor epoxide	ND (0.05)	ND (0.051)	ND (0.05)	ND (0.05)	ND (0.051)	ND (0.051)	ND (0.051)	ND (0.051)	ND (0.05)	ND (0.051)	ND (0.05)	NT	0.0001
Endosulfan-I	ND (0.05)	ND (0.051)	ND (0.05)	ND (0.05)	ND (0.051)	ND (0.051)	ND (0.051)	ND (0.051)	ND (0.05)	ND (0.051)	ND (0.05)	NT	0.93
Dieldrin	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	NT	0.000135
4,4'-DDE	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	NT	0.000588
Endrin	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	NT	0.0023
Endosulfan-II	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	NT	0.93
4,4'-DDD	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	NT	0.00083
Endosulfan sulfate	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	NT	0.93
4,4'-DDT	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	NT	0.000588
Methoxychlor	ND (0.5)	ND (0.51)	ND (0.5)	ND (0.5)	ND (0.51)	ND (0.51)	ND (0.51)	ND (0.51)	ND (0.5)	ND (0.51)	ND (0.5)	NT	0.03
Endrin ketone	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	NT	NS
Endrin aldehyde	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	NT	0.76
alpha-Chlordane	ND (0.05)	ND (0.051)	ND (0.05)	ND (0.05)	ND (0.051)	ND (0.051)	ND (0.051)	ND (0.051)	ND (0.05)	ND (0.051)	ND (0.05)	NT	0.000277
gamma-Chlordane	ND (0.05)	ND (0.051)	ND (0.05)	ND (0.05)	ND (0.051)	ND (0.051)	ND (0.051)	ND (0.051)	ND (0.05)	ND (0.051)	ND (0.05)	NT	0.000277
Toxaphene	ND (5.0)	ND (5.1)	ND (5.0)	ND (5.0)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.1)	ND (5.0)	ND (5.1)	ND (5)	NT	0.00073
Polychlorinated Biphenyls (PCBs) (ug/l)													
Aroclor 1016	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NT	0.00017
Aroclor 1221	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	NT	0.00017
Aroclor 1232	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NT	0.00017
Aroclor 1242	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NT	0.00017
Aroclor 1248	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NT	0.00017
Aroclor 1254	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NT	0.00017
Aroclor 1260	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	NT	0.00017
Metals (ug/l)													
Aluminum	150 J	931	182 J	226	225	73 J	8780	1050	1010	ND (48.4)	210	NT	NS
Antimony	6.1 J	9.6 J	7.6 J	8.3 J	8 J	3.6 J	12.6 J	3.1 J	2.1 J	4 J	6.2 J	NT	12.2
Arsenic	2.9 J	8.8 J	13.2	14	13.3	17.5	11.6	5.8 J	6.6 J	ND (2.3)	11.7	NT	0.017
Barium	388	280	334	328	344	94.4 J	1070	300	294	242	328	NT	2000
Beryllium	ND (0.2)	ND (0.2)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.2)	1 J	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.1)	NT	NS
Cadmium	ND (0.3)	1.1 J	0.96 J	1.3 J	1.1 J	ND (0.3)	2.5 J	0.74 J	0.53 J	ND (0.3)	0.93 J	NT	1
Calcium	107000	50000	57500	53700	72700	25000	202000	60200	58800	66200	48200	NT	NS
Chromium	6.8 J	61.9	80.9	87.5	89.7	16	102	52.9	52	12.1	88.4	NT	160
Cobalt	4.9 J	18.2 J	25.7 J	28 J	28.1 J	3.5 J	19.8 J	6.7 J	6.6 J	4 J	26.8 J	NT	NS
Copper	34.4	284	288	276	272	28.3	1210	74.9	73.6	26.5	260	NT	2.4
Iron	635	6130	6240	6710	6880	1960	20400	5330	5210	2280	6740	NT	NS
Lead	6.8	178	109	139	133	14.9	776	54	53.4	6	130	NT	2.5
Magnesium	54900	36300	43600	42700	43100	18700	44500	29900	29400	25900	41300	NT	NS
Manganese	198	215 J	225	171	272	238	1070	1330	130	197	166	NT	100
Mercury	ND (0.1)	1.1 J	0.3	0.23	0.26	0.17 J	25.3 J	0.9 J	1.6 J	ND (0.1)	0.21 J	NT	0.012
Nickel	22.9 J	119	150	159	159	153	218	33.1 J	32.8 J	24.2 J	152	NT	8.2