APPENDIX E

Monitoring Wells and Piezometers Decommissioning

APPENDIX E
MONITORING WELLS AND PIEZOMETERS DECOMMISSIONING

Resources for Responsible Site Management, Inc., as Trustee for the Industri-Plex Site Custodial Trust (Tax Map 10-1-06)

Well No.	Date Drilling Completed for Installation	Date Decommissioning Completed	Grout Type	Well Casing Removed	Location
OW-43	4/1/1991	2/12/1993	Bentonite/Cement	Yes	East Central Hide Pile
OW-44	4/11/1991	2/12/1993	Bentonite/Cement	Yes	East Central Hide Pile
UID-40	3/14/1989	5/5/1993	Bentonite/Cement	Yes	North East Cen. Hide Pile

D.L. Maher Co./Maher Environmental ISRT SITE 92-247-ES

Report of Well Decommissioning

WELL NUMBER OW-43

Location E-C Hide Pile EZ
Industriplex Site

City/Town Woburn, MA

GEOGRAPHIC DESCRIPTION

1100 ft. (N) S E W of Atlantic

____ mi. N S E W of intersect. w/ ____

Latitude : ____ deg ____ min ____ sec

Longitude: ____ deg ____ min ____ sec

Well Owner Industriplex Remedial Trust
41 Atlantic Ave.
Woburn, MA. 01801

HISTORICAL WELL INFORMATION

Total Well Depth 14 ft. Depth to Rock N/A ft.

Method Drilled HSA

rehole diameter 6 Date Drilled 4/1/91

Formation Log

Material Logged	From	To
Fine silty sand	0	17

Screen

Type PVC SCH 40 Diameter 4 in.

Slot # 10 Length 5 From 9 to 14 ft.

Casing

Type PVC SCH 40 Diameter 4 in.

Length 10 From 0 to 9 ft.

Gravel Pack Length 10 From 4 to 14 ft.

Grout Seal Length 4 From 0 to 4 ft.

ABANDONMENT INFORMATION

Water Lvl 7.5 ft. Date Measured 2/12/93

Measurement Reference Point ground

Well Condition fine

Actual Well Depth from Grade 14 ft.

Abandonment Procedure

____ Over-drill x Abandon in Place

Over-drill Information

Equipment Used: N/A

Over-drill Diameter ____ in. Over-drill depth ____ ft.

Abandon in Place Information

Equipment Used: B-53 Auger
Perforating Tools

Well Perforated from 7 to 14 feet

Other ____

Grout Information

Mix - 95% Portland Cement/ 5% Bentonite

Hole/well grout from 3 to 14 feet

Volume of grout used 3 cubic feet

Surface Completion

Existing Protective Cover/Gate Box removed? (Yes) No

x In-ground Concrete Plug ____ Concrete Pad

Date of Decommissioning: 2/12/93

Comments: ____

Driller Graglia

Firm D.L. Maher Co.

Mass Registration # 624; 2

Address 71 Concord Street
N. Reading, MA 01864

Signature of supervising registered well driller

D.L. Maher Co./Maher Environmental

ISRT SITE 92-247-ES

Report of Well Decommissioning

WELL NUMBER OW-44

Location E-C Hide Pile EZ
Industriplex Site

City/Town Woburn, MA

GEOGRAPHIC DESCRIPTION

1000 ft. (N) S E W of Atlantic

.2 mi. N S E (W) of intersect. w/ Commerce

Latitude : _____ deg _____ min _____ sec

Longitude: _____ deg _____ min _____ sec

Well Owner Industriplex Remedial Trust
41 Atlantic Ave.
Woburn, MA. 01801

HISTORICAL WELL INFORMATION

Total Well Depth 16.5 ft. Depth to Rock N/A ft.

Method Drilled HSA

Borehole diameter 10 Date Drilled 4/11/91

Formation Log

Material Logged	From	To
Red, Purple Silt	0	5
Med. to fine sand	5	10
Dense sand & gravel	10	16.5

Screen

Type PVC 40 Diameter 4 in.

Slot # .010 Length 10 From 6.5 to 16.5 ft.

Casing

Type PVC 40 Diameter 4 in.

Length 8 From -1.5 to 6.5 ft.

Gravel Pack Length 12 From 4.5 to 16.5 ft.

Grout Seal Length 1.5 From 3 to 4.5 ft.

ABANDONMENT INFORMATION

Water Lvl 2.65 ft. Date Measured 2/12/93

Measurement Reference Point ground

Well Condition fine

Actual Well Depth from Grade 16.5 ft.

Abandonment Procedure

_____ Over-drill x Abandon in Place

Over-drill Information

Equipment Used: N/A

Over-drill Diameter _____ in. Over-drill depth _____ ft.

Abandon in Place Information

Equipment Used: B-53 Auger
Perforating Tools

Well Perforated from 4.5 to 16.5 feet

Other _____

Grout Information

Mix - 95% Portland Cement/ 5% Bentonite

Hole/well grout from 3 to 16.5 feet

Volume of grout used 3 cubic feet

Surface Completion

Existing Protective Cover/Gate Box removed? (Yes) No

x In-ground Concrete Plug _____ Concrete Pad

Date of Decommissioning: 2/12/93

Comments: _____

Driller Graglia
Firm D.L. Maher Co.
Mass Registration # 624; 2
Address 71 Concord Street
N. Reading, MA 01864

Signature of supervising registered well driller

D.L. Maher Co./Maher Environmental ISRT SITE 92-247-ES

Report of Well Decommissioning

WELL NUMBER UID-40/89-35

Location Northern portion E-C Hide Industriplex Site

City/Town Woburn, MA

GEOGRAPHIC DESCRIPTION

1000 ft. (N) S E W of Atlantic

.09 mi. N S E (W) of intersect. w/Commerce

Latitude : _____ deg _____ min _____ sec

Longitude: _____ deg _____ min _____ sec

Well Owner Industriplex Remedial Trust
41 Atlantic Ave.
Woburn, MA. 01801

HISTORICAL WELL INFORMATION

Total Well Depth 8 ft. Depth to Rock N/A ft.

Method Drilled Auger

hole diameter 8 Date Drilled 3/14/89

Formation Log

Material Logged	From	To
Fine sand	0	8

Screen

Type PVC Diameter 1.25 in.

Slot # .010 Length 5 From 3 to 8 ft.

Casing

Type PVC Diameter 1.25 in.

Length 5 From -2 to 3 ft.

.vel Pack Length 7 From 1 to 8 ft.

Grout Seal Length 1 From 0 to 1 ft.

ABANDONMENT INFORMATION

Water Lvl N/A ft. Date Measured 5/5/93

Measurement Reference Point ground

Well Condition fine

Actual Well Depth from Grade 8 ft.

Abandonment Procedure

_____ Over-drill x Abandon in Place

Over-drill Information

Equipment Used: N/A

Over-drill Diameter _____ in. Over-drill depth _____ ft.

Abandon In Place Information

Equipment Used: B-53

Well Perforated from N/A to _____ feet

Other PVC pulled

Grout Information

Mix - 95% Portland Cement/ 5% Bentonite

Hole/well grout from 3 to 8 feet

Volume of grout used .75 cubic feet

Surface Completion

Existing Protective Cover/Gate Box removed? (Yes) No

x In-ground Concrete Plug _____ Concrete Pad

Date of Decommissioning: 5/5/93

Comments: Well identified as 89-35. Well pulled & grouted to eliminate intrusive activity.

Driller Graglia

Firm D.L. Maher Co.

Mass Registration # 624; 2

Address 71 Concord Street, N. Reading, MA 01864

Signature of supervising registered well driller

APPENDIX F

Fill Soil, Aggregate, Riprap, and Topsoil Materials

APPENDIX F.1

Source Test Results

0300.600.001
Cover Soil Analysis

MEMORANDUM

TO: Trustee Representative, ISRT DATE: 3/10/94
FROM: Peter Neumann, Golder Associates Inc. JOB NUMBER: 933-6142
RE: Results of Chemical Analysis for Cover Soil Stockpile 5-15. PAGE: 1 OF 1

	Test	Limit
Stockpile 5		
Test 47	Cr = 23.3 mg/kg	Cr Threshold = 23 mg/kg
Test 48	Cr = 26.5 mg/kg	Cr Threshold = 23 mg/kg
	The samples were not tested for volatiles. Sample hold times were exceeded for metals. Other hold times were not able to be determined.	
Stockpile 6		
Test 54	Cr = 28.9 mg/kg	Cr Threshold = 23 mg/kg
Test 55	Cr = 39.1 mg/kg	Cr Threshold = 23 mg/kg
	Co = 26.3 mg/kg	Co Threshold = 20 mg/kg
	The samples were not tested for volatiles. Sample hold times were not able to be determined.	
Stockpile 7		
Test 71	None exceeded	
Test 72	Cr = 39.7 mg/kg	Cr Threshold = 23 mg/kg
Stockpile 8		
Test 73	None exceeded	
Test 74	Cr = 38.6 mg/kg	Cr Threshold = 23 mg/kg
Stockpile 9		
Test 75	None exceeded	
Test 76	Cr = 89.7 mg/kg	Cr Threshold = 23 mg/kg
	Cu = 71.5 mg/kg	Cu Threshold = 50 mg/kg
	Mn= 1510 mg/kg	Mn Threshold = 1,000 mg/kg
	Ni = 150 mg/kg	Ni Threshold = 100 mg/kg
Stockpile 10		
Test 77	TCE = 2.27 ug/kg	Detection Limit = 2.0 ug/kg
Test 78	Cr = 36.3 mg/kg	Cr Threshold = 23 mg/kg
Stockpile 11		
Test 79	None exceeded	
Test 80	Cr = 82.6 mg/kg	Cr Threshold = 23 mg/kg
	Co = 20.4 mg/kg	Co Threshold = 20 mg/kg
	Cu = 61 mg/kg	Cu Threshold = 50 mg/kg
Stockpile 12		
Test 81	None exceeded	
Test 82	Cr = 36.6 mg/kg	Cr Threshold = 23 mg/kg
Stockpile 13		
Test 83	None exceeded	
Test 84	Cr = 32.8 mg/kg	Cr Threshold = 23 mg/kg
Stockpile 14		
Test 86	Cr = 29.9 mg/kg	Cr Threshold = 23 mg/kg
Stockpile 15		
Test 88	Cr = 36.8 mg/kg	Cr Threshold = 23 mg/kg

Abbreviations: *Cr = Chromium* *Co = Cobalt* *Ni = Nickel*
Cu = Copper *Mn = Manganese*

MEMORANDUM

TO: Trustee Representative, ISRT — DATE: 2/28/94
FROM: Peter Neumann, Golder Associates Inc. — JOB NUMBER: 933-6142
RE: Results of Chemical Analysis for Cover Soil Stockpile 7-13. PAGE: 1 OF 2

Materials Reviewed:

1. Submittal consisted of 33 pages (8 1/2 by 11 inch) Analytical Test Results. Chain of Custody shows samples taken 9/21/93

o Soil samples from Deer Island Cover Soil stockpiled east of the north end of Commerce Way and just SE of the intersection with Atlantic Ave, Woburn.

o Analytical Test Results from Toxicon Corporation. Samples tested before 9/24/93.

	Test	Limit
Stockpile 7		
Test 71	None exceeded	
Test 72	Cr = 39.7 mg/kg	Cr Threshold = 23 mg/kg
Stockpile 8		
Test 73	None exceeded	
Test 74	Cr = 38.6 mg/kg	Cr Threshold = 23 mg/kg
Stockpile 9		
Test 75	None exceeded	
Test 76	Cr = 89.7 mg/kg	Cr Threshold = 23 mg/kg
	Cu = 71.5 mg/kg	Cu Threshold = 50 mg/kg
	Mn= 1510 mg/kg	Mn Threshold = 1,000 mg/kg
	Ni = 150 mg/kg	Ni Threshold = 100 mg/kg
Stockpile 10		
Test 77	Trichloroethene = 2.27 ug/kg	Detection Limit = 2.0 ug/kg
Test 78	Cr = 36.3 mg/kg	Cr Threshold = 23 mg/kg
Stockpile 11		
Test 79	None exceeded	
Test 80	Cr = 82.6 mg/kg	Cr Threshold = 23 mg/kg
	Co = 20.4 mg/kg	Co Threshold = 20 mg/kg
	Cu = 61 mg/kg	Cu Threshold = 50 mg/kg
Stockpile 12		
Test 81	None exceeded	
Test 82	Cr = 36.6 mg/kg	Cr Threshold = 23 mg/kg
Stockpile 13		
Test 83	None exceeded	
Test 84	Cr = 32.8 mg/kg	Cr Threshold = 23 mg/kg

Abbreviations: *Cr = Chromium* *Co = Cobalt* *Ni = Nickel* *Cu = Copper* *Mn = Manganese*

A survey of the stockpile area was conducted on February 23, 1994:

Deer Island Soil Currently Stockpiled: Piles 2, 3, 4, 6, **9**, **11**, **12**, **13**, 16
Deer Island Soil Piles Used in 1993: Piles 1, 5, **7**, **8**, **10**, 14, 15

Recommendation:

Place a hold on the soil stockpiles showing levels of constituents exceeding the thresholds until the Agencies comment. This would include all the stockpiles tested included in this package. Since the Agencies in the past have accepted levels of chromium higher than the Site assigned threshold of 23 mg/kg, the stockpiles of particular concern are those with other constituents cobalt, copper, manganese, nickel and trichloroethene. The piles in this category include stockpiles 9, 10 and 11. Of these stockpiles only pile 10 was used in 1993.

While the Deer Island soil was used on the site as compacted fill and would be covered, several properties were covered with the Deer Island soil as cover soil. The following properties received the Deer Island soil as cover soil on the approximate date listed.

Property	Approximate Date of Deer Island Soil Placement
North Slope N of ECHP	October 12 1993
North of 231 New Boston St.	November 5, 1993
231 New Boston Street	October 26 1993
229 New Boston Street	October 26 1993
227 New Boston Street	October 26 1993
225 New Boston Street	October 26 1993
223 New Boston Street	October 29 1993
219 New Boston Street	September 25, 1993
217 New Boston Street	November 11, 1993
216 New Boston Street	November 2, 1993
Front of Dagata	November 9, 1993
South Dagata	October 13, 1993
225 Merrimac St.	November 9, 1993
BECO ROW S of Dagata	October 10, 1993
Pebco S of Detention Basin	November 9, 1993

MEMORANDUM

TO: Trustee Representative, ISRT DATE: 3/18/94
FROM: Peter Neumann, Golder Associates Inc. JOB NUMBER: 903-6400
RE: Review of CWM submittal "Stockpiled Cover Soil Analysis-Piles 14 and 15"

Materials Reviewed:

Submittal consisted of 13 pages (8 1/2-inch by 11-inch) of Analytical Test Results.

o Soil samples from Deer Island Cover Soil stockpiled east of the north end of Commerce Way and just SE of the intersection with Atlantic Ave, Woburn.

1. Analytical Test Results from Toxikon Corp. for stockpile 14;

Analysis No.085		
VOC	ND	
Analysis No. 086		
Metals	Chromium 29.9	Threshold = 23 mg/kg
Cyanide	ND	
TPH	53.5 mg/kg	Threshold = 200 mg/kg
Semi VOC	ND	
Pesticides	ND	

o Chain-of-Custody, p. 3

Sample	Date Sampled	Date Extracted	14 Day Limit
85	9/21/93	9/22/93	OK
86	9/21/93	9/21/93	OK

---

2. Analytical Test Results from Toxikon Corp. for stockpile 15;

Analysis No.087
VOC ND
Analysis No. 088

Metals	Chromium 36.8	Threshold = 23 mg/kg
Cyanide	ND	
TPH	73.7 mg/kg	Threshold = 200 mg/kg
Semi VOC	ND	
Pesticides	ND	

o Chain-of-Custody, p. 3

Sample	Date Sampled	Date Extracted	14 Day Limit
87	9/21/93	9/22/93	OK
88	9/21/93	9/21/93-9/22/93	OK

Review Comments:

On March 10, 1994 at the close of the monthly meeting with EPA and MDEP stockpile numbers 14 and 15 were accepted along with stockpiles 5-8, 10-13.

Disposition of Submittal:
No exceptions taken in accordance with Section 01300 of the 100% Design Documents.

Attachments:

Analytical Test Results

TOXIKON
225 Wildwood Ave., Woburn, MA 01801
Telephone: (617) 933-6903
Fax: (617) 933-9196

CHAIN OF CUSTODY RECORD

WORK ORDER #: 9209-318

DUE DATE : 9-23-93

COMPANY: Rust Remedial Serv.
ADDRESS : 71 Cummings Park
Woburn MA 01801
PHONE # : (617) 932-7190 FAX #: (617) 932
P.O. # : 405590
CLIENT CONTACT : Chris Riley
PROJECT ID/LOCATION: Triplex - Malden MA

SAMPLE TYPE
1. WATER
2. SOIL
3. SLUDGE
4. OIL
5. TISSUE
6. DRINKING WATER
OTHER

CONTAINER TYPE
P - PLASTIC
G - GLASS
V - VOA

ANALYSES

TOXIKON #	SAMPLE IDENTIFICATION	SAMPLE TYPE	CONTAINER SIZE	CONTAINER TYPE	CONTAINER #	SAMPLING DATE	SAMPLING TIME	PRESERVATIVE	Metals (ZZZ)	PCB (TCL)	7010 PAHS (TCL)	Cyanide	TPH	8240	COMMENTS
1	#85	2	40ml V	G	1	9/21/93	11:15	G3	X				X		
2	#86	2	1L				11:23		X	X	X	X	X		
3	#87	2	40ml V				11:35	G3	X				X		
4	#88	2	1L				11:10		X	X	X	X	X		

These samples transferred from W.O. 9309317 (C15-19) PHC 9/21/93

RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE: 9-21-93
	TIME:		TIME: 17:30
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:
RELINQUISHED BY:	DATE:	RECEIVED FOR LAB BY:	DATE:
	TIME:		TIME:
METHOD OF SHIPMENT:			

SPECIAL INSTRUCTIONS

☒ RUSH, ...BUSINESS DAY TURNAROUND

☐ ROUTINE

Sample Disposal Information

Are there any other known or suspected contaminants in these samples other than those listed above ?

☐ Yes ☐ No If Yes, list known:

 TOXIKON CORP. REPORT Work Order # 93-09-318

Received: 09/21/93 09/23/93 17:20:16

REPORT RUST REMEDIAL SERVICES
TO 41 ATLANTIC AVE
WOBURN, MA 01801
(617)938-7190 FAX:7194
ATTEN CHRIS RILEY

PREPARED TOXIKON CORPORATION
BY 225 WILDWOOD AVE
WOBURN, MA 01801
ATTEN PAUL LEIBERG
PHONE (617)933-6903

CERTIFIED BY
CONTACT KARL

CLIENT RUST WOB SAMPLES 4
COMPANY RUST REMEDIAL SERVICES
FACILITY 41 ATLANTIC AVE
WOBURN, MA 01801

MA CERT # MA064: TRACE METALS, SULFATE, CYANIDE, TURN., RES. FREE CHLORINE, Ca, TOTAL ALK., TDS, pH, THMs, VOC, PEST., NUTRIENTS, DEMAND, O&G, PHENOLICS, PCBs (OIL). CT DHS #PH-0563, NY #10778 FL HRS E87143, NJ DEP 59538, NC DNR286, SC 88002, NH 204091-C.

WORK ID IPLEX-WOBURN,MA.
TAKEN 9/21/93
TRANS
TYPE SOIL
P.O. # 405590
INVOICE under separate cover

Verified By:
MA CERT# MA064:

SAMPLE IDENTIFICATION

01 #85
02 #86
03 #87
04 #88

TEST CODES and NAMES used on this workorder

8240	PURGEABLE ORGANICS VOA	SE	SELENIUM
8270	A/BN EXTRACTABLES	TL	THALLIUM
AG	SILVER	TPH IR	TPH BY IR
AL	ALUMINUM	V	VANADIUM
AS	ARSENIC	ZN	ZINC
BA	BARIUM		
BE	BERYLLIUM		
CA	CALCIUM		
CD	CADMIUM		
CN TOT	CYANIDE TOTAL		
CO	COBALT		
CR	CHROMIUM		
CU	COPPER		
FE	IRON		
HG	MERCURY		
K	POTASSIUM		
MEXTSG	METALS TOTAL EXT SOIL-GFAA		
MEX HG	METALS, EXT. FOR MERCURY		
MEX TS	METALS, TOTAL EXT., SOIL		
MG	MAGNESIUM		
MN	MANGANESE		
NA	SODIUM		
NI	NICKEL		
PB	LEAD		
PPCBS	PESTICIDES/PCB (SOIL)		
SB	ANTIMONY		

TEST CODE 8240 NAME PURGEABLE ORGANICS VOA

EPA METHOD. 8240: Gas Chromatography/Mass Spectrometry for Volatile Organics.

Reference: Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods. EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

TEST CODE 8270 NAME A/BN EXTRACTABLES

EPA METHOD: 8270: Gas Chromatography / Mass Spectrometry for Semivolatile Organics; Capillary Column Technique.

Reference: Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods. EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

TEST CODE AS NAME ARSENIC

TEST CODE CN TOT NAME CYANIDE TOTAL

EPA METHOD: 335.3 for water sample

Reference: Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020 (Revised, March 1983). EPA/EMSL.

EPA METHOD: 9010 for soil sample

Reference: Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

TEST CODE MEXTSG NAME METALS TOTAL EXT SOIL-GFAA

REFERENCE:
EPA METHOD 3005. Acid Digestion of Waters for Total Recoverable or Dissolved Metals for Analysis by Flame Atomic Absorption Spectroscopy or Inductively Coupled Plasma Spectroscopy. Test Methods for Evaluating Physical/Chemical Methods. SW 846, 3rd Edition.

TEST CODE MEX HG NAME METALS, EXT. FOR MERCURY

REFERENCE:
EPA METHOD 245.1 Mercury. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020.

TEST CODE MEX TS NAME METALS, TOTAL EXT., SOIL

REFERENCE:
EPA METHOD 3050: Acid Digestion of Sediments, Sludges and Soils. Test Methods for Evaluating Solid Waste Physical/Chemical Methods. SW 846, 3rd Edition.

Received: 09/21/93 Test Methodology

TEST CODE TPH IR NAME TPH BY IR

EPA METHOD: 418.1 for water sample.

Reference: Methods for Chemical Analysis of Water and Wastes.
EPA 600/4-79-020 (Revised, March 1983). EPA/EMSL, Cincinnati, OH.

EPA METHOD: 9073 for soil sample.

Reference: Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.
EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

 TOXIKON CORP. REPORT Work Order # 93-09-318

Received: 09/21/93 Results by Sample

SAMPLE ID #85 FRACTION 01A TEST CODE 8240 NAME PURGEABLE ORGANICS VOA

Date & Time Collected 09/21/93 11:15:00 Category SOIL

PURGEABLE ORGANICS VOA

	RESULT	LIMIT		RESULT	LIMIT
Chloromethane	ND	2.0	Trichloroethene	ND	2.0
Bromomethane	ND	2.0	Dibromochloromethane	ND	2.0
Vinyl Chloride	ND	10	1,1,2-Trichloroethane	ND	2.0
Chloroethane	ND	2.0	Benzene	ND	2.0
Methylene Chloride	ND	10	cis-1,3-Dichloropropene	ND	2.0
Acetone	ND	50	2-Chloroethylvinylether	ND	2.0
Carbon Disulfide	ND	2.0	Bromoform	ND	2.0
1,1-Dichloroethene	ND	2.0	2-Hexanone	ND	4.0
Trichlorofluoromethane	ND	2.0	4-Methyl-2-pentanone	ND	4.0
1,1-Dichloroethane	ND	2.0	Tetrachloroethene	ND	2.0
Total 1,2-Dichloroethene	ND	2.0	1,1,2,2-Tetrachloroethane	ND	2.0
Chloroform	ND	2.0	Toluene	ND	2.0
1,2-Dichloroethane	ND	2.0	Chlorobenzene	ND	2.0
2-Butanone	ND	10	Ethyl Benzene	ND	2.0
1,1,1-Trichloroethane	ND	2.0	Styrene	ND	2.0
Carbon Tetrachloride	ND	2.0	Total Xylenes	ND	2.0
Vinyl Acetate	ND	2.0	1,2-Dichlorobenzene	ND	2.0
Bromodichloromethane	ND	2.0	1,3-Dichlorobenzene	ND	2.0
1,2-Dichloropropane	ND	2.0	1,4-Dichlorobenzene	ND	2.0
trans-1,3-Dichloropropene	ND	2.0			

Notes and Definitions for this Report.

DATE RUN: 09/22/93
ANALYST: KKP
INSTRUMENT: HP-1
DIL. FACTOR: 1.0
COMMENTS:
UNITS: ug/Kg

ND = not detected at detection limit

 TOXIKON CORP. REPORT Work Order # 93-09-318

Received: 09/21/93 Results by Sample

SAMPLE ID #86 SAMPLE # 02 FRACTIONS: A,B,C

Date & Time Collected 09/21/93 11:23:00 Category SOIL

AG ND mg/Kg DL= 1.01	AL 12100 mg/Kg DL= 10.1	AS 6.03 mg/Kg DL=0.267	BA 29.2 mg/Kg DL=0.506	BE 0.455 mg/Kg DL= 0.202	CA 4910 mg/Kg DL=2.53
CD 3.44 mg/Kg DL=0.506	CN_TOT ND mg/Kg DL=0.71	CO 12.0 mg/Kg DL=0.506	CR 29.9 mg/Kg DL=0.506	CU 25.6 mg/Kg DL=0.506	FE 27200 mg/Kg DL=0.506
HG ND mg/Kg DL=0.231	K 1280 mg/Kg DL=25.3	MG 5620 mg/Kg DL=2.53	MN 531 mg/Kg DL=0.101	NA 184 mg/Kg DL=25.3	NI 52.6 mg/Kg DL=2.02
PB 17.4 mg/Kg DL=2.53	SB ND mg/Kg DL=7.59	SE ND mg/Kg DL=0.267	TL ND mg/Kg DL=0.267	TPH_IR 55.5 mg/Kg DL=40	V 30.8 mg/Kg DL=0.506
ZN 55.2 mg/Kg DL=0.304					

 TOXIKON CORP. REPORT Work Order # 93-09-318

Received: 09/21/93 Results by Sample

SAMPLE ID #86 FRACTION 02A TEST CODE 8270 NAME A/BN EXTRACTABLES

Date & Time Collected 09/21/93 11:23:00 Category SOIL

	RESULT	LIMIT
BASE NEUTRAL EXTRACTABLES		
bis(-2-Chloroethyl) ether	ND	360
1,3-Dichlorobenzene	ND	360
1,4-Dichlorobenzene	ND	360
1,2-Dichlorobenzene	ND	360
bis(2-Chloroisopropyl) ether	ND	360
N-Nitroso-Di-N-Propylamine	ND	360
Hexachloroethane	ND	360
Nitrobenzene	ND	360
Isophorone	ND	360
bis(2-Chloroethoxy) methane	ND	360
1,2,4-Trichlorobenzene	ND	360
Naphthalene	ND	360
Hexachlorobutadiene	ND	360
Hexachlorocyclopentadiene	ND	360
2-Chloronaphthalene	ND	360
Dimethyl phthalate	ND	360
Acenaphthylene	ND	360
Acenaphthene	ND	360
2,4-Dinitrotoluene	ND	360
2,6-Dinitrotoluene	ND	360
Diethylphthalate	ND	360
4-Chlorophenyl phenyl ether	ND	360
Fluorene	ND	360
N-Nitrosodiphenylamine	ND	360
4-Bromophenyl phenyl ether	ND	360
Hexachlorobenzene	ND	360
Phenanthrene	ND	360
Anthracene	ND	360
Di-n-butylphthalate	ND	360
Fluoranthene	ND	360
Pyrene	ND	360
Butyl benzyl phthalate	ND	360
3,3'-Dichlorobenzidine	ND	710
Benzo (a) anthracene	ND	360
bis (2-ethylhexyl)phthalate	ND	360

	RESULT	LIMIT
Chrysene	ND	360
Di-n-octyl phthalate	ND	360
Benzo(b)fluoranthene	ND	360
Benzo(k)fluoranthene	ND	360
Benzo(a)pyrene	ND	360
Indeno(1,2,3-cd)pyrene	ND	360
Dibenz(a,h)anthracene	ND	360
Benzo(g,h,i)perylene	ND	360
ACID EXTRACTABLES		
Phenol	ND	360
2-Chlorophenol	ND	360
Benzyl Alcohol	ND	710
2-Methylphenol	ND	360
4-Methylphenol	ND	360
2-Nitrophenol	ND	360
2,4-Dimethylphenol	ND	360
Benzoic Acid	ND	1700
2,4-Dichlorophenol	ND	360
4-Chloroaniline	ND	710
4-Chloro-3-methylphenol	ND	710
2-Methylnaphthalene	ND	360
2,4,6-Trichlorophenol	ND	360
2,4,5-Trichlorophenol	ND	360
2-Nitroaniline	ND	1700
3-Nitroaniline	ND	1700
2,4-Dinitrophenol	ND	1700
4-Nitrophenol	ND	1700
Dibenzofuran	ND	360
4-Nitroaniline	ND	1700
4,6-Dinitro-2-methylphenol	ND	1700
Pentachlorophenol	ND	1700

Notes and Definitions for this Report:

UNITS: ug/Kg
EXTRACTED: 09/21/93
DATE RUN: 09/23/93
ANALYST: GKC
INSTRUMENT: HP-3
DIL. FACTOR: 1.0

ND - not detected at detection limit

Received: 09/21/93 Results by Sample

SAMPLE ID #86 FRACTION 02A TEST CODE PPCBS NAME PESTICIDES/PCB (SOIL)
Date & Time Collected 09/21/93 11:23:00 Category SOIL

PESTICIDES

	RESULT	LIMIT
Alpha-BHC	ND	0.010
Gamma-BHC (Lindane)	ND	0.010
Beta-BHC	ND	0.010
Heptachlor	ND	0.010
Delta-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.10

PCB

	RESULT	LIMIT
Aroclor 1016	ND	0.10
Aroclor 1221	ND	0.10
Aroclor 1232	ND	0.10
Aroclor 1242	ND	0.10
Aroclor 1248	ND	0.10
Aroclor 1254	ND	0.10
Aroclor 1260	ND	0.10
Aroclor 1262	ND	0.10
Aroclor 1268	ND	0.10

Notes and Definitions for this Report:

EXTRACTED: 09/21/93
UNITS: mg/Kg
DATE RUN: 09/22/93
ANALYST: AP
INSTRUMENT: HP 2
DIL. FACTOR: 1

ND = not detected at detection limit

 TOXIKON CORP. REPORT Work Order # 93-09-318

Received: 09/21/93 Results by Sample

SAMPLE ID #87 FRACTION 03A TEST CODE 8240 NAME PURGEABLE ORGANICS VOA

Date & Time Collected 09/21/93 11:05:00 Category SOIL

PURGEABLE ORGANICS VOA

	RESULT	LIMIT		RESULT	LIMIT
Chloromethane	ND	2.0	Trichloroethene	ND	2.0
Bromomethane	ND	2.0	Dibromochloromethane	ND	2.0
Vinyl Chloride	ND	10	1,1,2-Trichloroethane	ND	2.0
Chloroethane	ND	2.0	Benzene	ND	2.0
Methylene Chloride	ND	10	cis-1,3-Dichloropropene	ND	2.0
Acetone	ND	50	2-Chloroethylvinylether	ND	2.0
Carbon Disulfide	ND	2.0	Bromoform	ND	2.0
1,1-Dichloroethene	ND	2.0	2-Hexanone	ND	4.0
Trichlorofluoromethane	ND	2.0	4-Methyl-2-pentanone	ND	4.0
1,1-Dichloroethane	ND	2.0	Tetrachloroethene	ND	2.0
Total 1,2-Dichloroethene	ND	2.0	1,1,2,2-Tetrachloroethane	ND	2.0
Chloroform	ND	2.0	Toluene	ND	2.0
1,2-Dichloroethane	ND	2.0	Chlorobenzene	ND	2.0
2-Butanone	ND	10	Ethyl Benzene	ND	2.0
1,1,1-Trichloroethane	ND	2.0	Styrene	ND	2.0
Carbon Tetrachloride	ND	2.0	Total Xylenes	ND	2.0
Vinyl Acetate	ND	2.0	1,2-Dichlorobenzene	ND	2.0
Bromodichloromethane	ND	2.0	1,3-Dichlorobenzene	ND	2.0
1,2-Dichloropropane	ND	2.0	1,4-Dichlorobenzene	ND	2.0
trans-1,3-Dichloropropene	ND	2.0			

Notes and Definitions for this Report:

DATE RUN: 09/22/93
ANALYST: KKP
INSTRUMENT: HP-1
DIL. FACTOR: 1.0
COMMENTS:
UNITS: ug/Kg

ND = not detected at detection limit

Received: 09/21/93

Results by Sample

SAMPLE ID #88 SAMPLE # 04 FRACTIONS: A,B,C

Date & Time Collected 09/21/93 11:10:00 Category SOIL

AG ND mg/Kg DL=1.01	AL 17300 mg/Kg DL=10.1	AS 4.32 mg/Kg DL=0.267	BA 52.4 mg/Kg DL=0.506	BE 0.552 mg/Kg DL=0.202	CA 5470 mg/Kg DL=2.53
CD 4.23 mg/Kg DL=0.506	CN_TOT ND mg/Kg DL=0.71	CO 12.0 mg/Kg DL=0.506	CR 36.8 mg/Kg DL=0.506	CU 30.5 mg/Kg DL=0.506	FE 36400 mg/Kg DL=0.506
HG ND mg/Kg DL=0.231	K 2500 mg/Kg DL=25.3	MG 7540 mg/Kg DL=2.53	MN 621 mg/Kg DL=0.101	NA 197 mg/Kg DL=25.3	NI 61.6 mg/Kg DL=2.02
PB 21.1 mg/Kg DL=2.53	SB ND mg/Kg DL=7.59	SE ND mg/Kg DL=0.267	TL ND mg/Kg DL=0.267	TPH_IR 73.7 mg/Kg DL=40	V 40.2 mg/Kg DL=0.506
ZN 62.6 mg/Kg DL=0.304					

Received: 09/21/93 Results by Sample

SAMPLE ID #88 FRACTION 04A TEST CODE 8270 NAME A/BN EXTRACTABLES

Date & Time Collected 09/21/93 11:10:00 Category SOIL

BASE NEUTRAL EXTRACTABLES	RESULT	LIMIT
bis(-2-Chloroethyl) ether	ND	350
1,3-Dichlorobenzene	ND	350
1,4-Dichlorobenzene	ND	350
1,2-Dichlorobenzene	ND	350
bis(2-Chloroisopropyl) ether	ND	350
N-Nitroso-Di-N-Propylamine	ND	350
Hexachloroethane	ND	350
Nitrobenzene	ND	350
Isophorone	ND	350
bis(2-Chloroethoxy) methane	ND	350
1,2,4-Trichlorobenzene	ND	350
Naphthalene	ND	350
Hexachlorobutadiene	ND	350
Hexachlorocyclopentadiene	ND	350
2-Chloronaphthalene	ND	350
Dimethyl phthalate	ND	350
Acenapnthylene	ND	350
Acenaphthene	ND	350
2,4-Dinitrotoluene	ND	350
2,6-Dinitrotoluene	ND	350
Diethylphthalate	ND	350
4-Chlorophenyl phenyl ether	ND	350
Fluorene	ND	350
N-Nitrosodiphenylamine	ND	350
4-Bromophenyl phenyl ether	ND	350
Hexachlorobenzene	ND	350
Phenanthrene	ND	350
Anthracene	ND	350
Di-n-butylphthalate	ND	350
Fluoranthene	ND	350
Pyrene	ND	350
Butyl benzyl phthalate	ND	350
3,3'-Dichlorobenzidine	ND	690
Benzo (a) anthracene	ND	350
bis (2-ethylhexyl)phthalate	ND	350

	RESULT	LIMIT
Chrysene	ND	350
Di-n-octyl phthalate	ND	350
Benzo(b)fluoranthene	ND	350
Benzo(k)fluoranthene	ND	350
Benzo(a)pyrene	ND	350
Indeno(1,2,3-cd)pyrene	ND	350
Dibenz(a,h)anthracene	ND	350
Benzo(g,h,i)perylene	ND	350
ACID EXTRACTABLES		
Phenol	ND	350
2-Chlorophenol	ND	350
Benzyl Alcohol	ND	690
2-Methylphenol	ND	350
4-Methylphenol	ND	350
2-Nitrophenol	ND	350
2,4-Dimethylphenol	ND	350
Benzoic Acid	ND	1700
2,4-Dichlorophenol	ND	350
4-Chloroaniline	ND	690
4-Chloro-3-methylphenol	ND	690
2-Methylnaphthalene	ND	350
2,4,6-Trichlorophenol	ND	350
2,4,5-Trichlorophenol	ND	350
2-Nitroaniline	ND	1700
3-Nitroaniline	ND	1700
2,4-Dinitrophenol	ND	1700
4-Nitrophenol	ND	1700
Dibenzofuran	ND	350
4-Nitroaniline	ND	1700
4,6-Dinitro-2-methylphenol	ND	1700
Pentachlorophenol	ND	1700

Notes and Definitions for this Report:

UNITS: ug/Kg
EXTRACTED: 09/21/93
DATE RUN: 09/23/93
ANALYST: GKC
INSTRUMENT: HP-3
DIL. FACTOR: 1.0

ND = not detected at detection limit

Received: 09/21/93 Results by Sample

SAMPLE ID #88 FRACTION 04A TEST CODE PPCBS NAME PESTICIDES/PCB (SOIL)
Date & Time Collected 09/21/93 11:10:00 Category SOIL

PESTICIDES

	RESULT	LIMIT
Alpha-BHC	ND	0.010
Gamma-BHC (Lindane)	ND	0.010
Beta-BHC	ND	0.010
Heptachlor	ND	0.010
Delta-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.10

PCB

	RESULT	LIMIT
Aroclor 1016	ND	0.10
Aroclor 1221	ND	0.10
Aroclor 1232	ND	0.10
Aroclor 1242	ND	0.10
Aroclor 1248	ND	0.10
Aroclor 1254	ND	0.10
Aroclor 1260	ND	0.10
Aroclor 1262	ND	0.10
Aroclor 1268	ND	0.10

Notes and Definitions for this Report:

EXTRACTED: 09/21/93
UNITS: mg/Kg
DATE RUN: 09/22/93
ANALYST: AP
INSTRUMENT: HP 2
DIL. FACTOR: 1

ND = not detected at detection limit

MEMORANDUM

TO: Trustee Representative DATE: 1/22/93
FROM: Peter Neumann, Golder Associates Inc. JOB NUMBER: 903-6400
RE: Revised proposed thresholds of clean soil to be used at Industri-Plex Site.

The following table has been revised based on a meeting with the EPA and MDEP and is presented as the clean soil guideline for the Industri-Plex Site. Metals which are naturally rock-forming compounds may vary from the guideline values on a case by case basis.

Tests	Proposed Threshold Levels for Clean Soil Used at IP	
Volatile Organic (TCL)	Non-detectable (2)	US EPA Method 8240
Acid/Base Neutrals (TCL)	Non-detectable (2)	US EPA Method 3550/8270/8270
Pesticides/PCB's (TCL)	Non-detectable	US EPA Method 3550/8080
Metals (TAL) (3)		
Aluminum	<100,000 mg/kg	US EPA Method 3050/6010
Antimony	<10 mg/kg	US EPA Method 3050/6010
Arsenic	<25 mg/kg	US EPA Method 3050/7060
Barium	<500 mg/kg	US EPA Method 3050/6010
Beryllium	<1 mg/kg	US EPA Method 3050/6010
Cadmium	<10 mg/kg	US EPA Method 3050/6010
Calcium	<50,000 mg/kg	US EPA Method 3050/6010
Chromium	<23 mg/kg	US EPA Method 3050/6010
Cobalt	<20 mg/kg	US EPA Method 3050/6010
Copper	<50 mg/kg	US EPA Method 3050/6010
Iron	<70,000 mg/kg	US EPA Method 3050/7420
Lead	<87 mg/kg	US EPA Method 3050/6010
Magnesium	<10,000 mg/kg	US EPA Method 3050/6010
Manganese	<1,000 mg/kg	US EPA Method 3050/6010
Mercury	<1 mg/kg	US EPA Method 3050/7470
Nickel	<100 mg/kg	US EPA Method 3050/6010
Potassium	<10,000 mg/kg	US EPA Method 3050/6010
Selenium	<20 mg/kg	US EPA Method 3050/7740
Silver	<20 mg/kg	US EPA Method 3050/6010
Sodium	<4,000 mg/kg	US EPA Method 3050/6010
Thallium	<5 mg/kg	US EPA Method 3050/7840
Vanadium	<150 mg/kg	US EPA Method 3050/6010
Zinc	<200 mg/kg	US EPA Method 3050/6010
Cyanide	<10 mg/kg	US EPA Method 9010
TPH (Total Petroleum) Hydrocarbon)	<200 mg/kg	US EPA Method 418.1

Notes:

1. At any time the Trust may revise this list to include testing for additional constituents which may pose a health threat.
2. Excludes common laboratory contaminants given in the EPA Region 1 CLP Data Validation Functional Guidelines.
3. TAL Metals by ICP and AA Methods, Test 6010, except run the following constituents by the following methods: (As) 7060 , (Pb) 7420 , (Se) 7740 (Th) 7840 , (Hg) 7470 . The 7000's are "furnace and cold vapor AA " methods.

MEMORANDUM

TO: Trustee Representative, ISRT DATE: 3/18/94
FROM: Peter Neumann, Golder Associates Inc. JOB NUMBER: 903-6400
RE: Review of CWM submittal "Stockpiled Cover Soil Analysis-Pile 3 and 4" (CWM Contl. Document #67300-031S-2-1)

Materials Reviewed:

1. Submittal consisted of 13 pages (8 1/2-inch by 11-inch) of Analytical Test Results.

- Soil sample from Deer Island Cover Soil stockpiled east of the north end of Commerce Way and just SE of the intersection with Atlantic Ave, Woburn.
- Analytical Test Results from 21st Century Environmental Inc.for **stockpile 3**; p. 10

  Analysis No. A 1932 CWM #004
  Metals Chromium 25.2 Threshold = 23 mg/kg

  Analysis No. A 1933 CWM #008 broken so used #001
  Metals Chromium 28.7 Threshold = 23 mg/kg
  Copper 90.7 Threshold = 50 mg/kg

  Analysis No. A 1934 CWM #010
  Chromium 25.8 Threshold = 23 mg/kg

  Analysis No. A 1936 CWM #011 & #012
  VOC ND but a detection below the MDL for Acetone & a detection in the blank for Methylene Chloride.

  Analysis No. A 1937-40 CWM #002, #005, #009, #028
  Cyanide ND
  TPH 97.7 mg/kg
  Semi VOC ND but Fluoranthane a CLP common lab contaminant was detected.
  Pesticides ND

- Chain-of-Custody, p. 3

Sample	Date Sampled	Date Tested	14 Day Limit
011 & 012	5/04/93	5/18/93	OK
2, 5, 9, 28	4/12-5/11	5/25/93	OK

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2. Submittal consisted of 12 pages (8 1/2-inch by 11-inch) of Analytical Test Results.

- Soil sample from Deer Island Cover Soil stockpiled east of the north end of Commerce Way and just SE of the intersection with Atlantic Ave, Woburn.
- Chain-of-Custody, p. 1
- Analytical Test Results from 21st Century Environmental Inc.for **stockpile 4**; p. 10

  Analysis No. A 1947 CWM #019
  Metals Chromium 23.9 Threshold = 23 mg/kg

  Analysis No. A 1948 CWM #022
  Metals Beryllium 1.14 Threshold = 1 mg/kg

  Analysis No. A 1949 CWM #025
  Metals ND

  Analysis No. A 1950-52 CWM #020, 023, & 026
  Cyanide ND
  TPH 50.5 mg/kg
  Semi VOC ND
  Pesticides ND

  Analysis No. A 1953-57 CWM #015, 018, 021, 024, 027.
  VOC Detected Methylene Chloride and Acetone in sample & blank. Both are on the CLP common lab contaminant list.

- Chain-of-Custody, p. 2

Sample	Date Sampled	Date Tested	14 Day Limit
15, 18, 21, 24 and 27	5/5-5/11	5/19/93	OK

Review Comments:

The values of the Analytical Test Results will be sent by mail to EPA and MDEP on June 21, 1993 since there will be no June meeting. A variance was requested since some metals values were above the threshold levels. The Agencies granted a variance to the site thresholds for stockpiles 3 and 4 on July 16, 1993. The result was verbally communicated to the Contractor at that time.

Disposition of Submittal:
No exceptions taken in accordance with Section 01300 of the 100% Design Documents

INDUSTRI-PLEX SITE

REMEDIAL TRUST

36 COMMERCE WAY
WOBURN, MA 01801

AGENCY MEETING

July 16, 1993

Attendees:	Joe DeCola	EPA Project Manager
	Jay Naparstek	DEP Project Manager
	Deb Baum	HNUS Resident Engineer
	Dave Baumgartner	ISRT Project Manager
	Dale Kling	ISRT Site Manager
	Peter Newmann	Golder Resident Engineer
	John Evans	CWM Project Engineer
	Scott Freeman	CWM Technical Consultant
	Chris Riley	CWM Construction Manager

Grubbing Specification Change

- Approval was postponed until July 21, 1993, the next monthly meeting when official HNUS comments on the change would be available.
- The test grub will be made following the ruling on the change.

Test Results of Deer Island Soil

- Based on the analyses, the cover soil piles #3 and #4 were approved.
- Agencies approved consolidating these piles.
- Agencies expressed concern over Beryllium levels in topsoil. Identified 0.8 ppm Be as threshold for topsoil. Identified source specifies Be as ND, with detection limit of 1 ppm. Will check further. Copies of topsoil analysis will be sent to Agencies & HNUS when available.
- Agencies expressed interest in visiting the vendor. Trip will be scheduled following next Wednesday's meeting.

TEL. 617-932-9599
FAX 617-932-9589

21ST CENTURY ENVIRONMENTAL

618 HERON DRIVE, P.O. BOX 489 • BRIDGEPORT, NJ 08014-0489 • 609-467-9521

CHEMICAL WASTE MANAGEMENT

PROJECT: INDUSTRI-PLEX

ANALYSIS NO:	CLIENT ID:
A 1932	004
A 1933	008
A 1934	010
A 1935	011
A 1936	012

DATE RECEIVED: MAY 12 1993

TWENTY FIRST CENTURY
ENVIRONMENTAL, INC.

RICHARD W. LYNCH
LABORATORY MANAGER

CERTIFICATE OF ANALYSIS

ANALYSIS NO: A 1932

CLIENT ID: 004

METALS	MDL (mg/kg)	RESULT (mg/kg)
ALUMINUM	10.0	15800
ANTIMONY	5.00	N.D.
ARSENIC	0.50	8.00
BARIUM	5.00	31.3
BERYLLIUM	1.00	N.D.
CADMIUM	1.00	N.D.
CALCIUM	5.00	3540
CHROMIUM	1.00	25.2
COBALT	5.00	13.9
COPPER	1.00	21.3
IRON	5.00	29500
LEAD	5.00	17.3
MAGNESIUM	5.00	7240
MANGANESE	1.00	626
MERCURY	0.25	N.D.
NICKEL	5.00	20.9
POTASSIUM	50.0	1590
SELENIUM	0.50	N.D.
SILVER	1.00	N.D.
SODIUM	5.00	470
THALLIUM	1.00	N.D.
VANADIUM	5.00	32.6
ZINC	1.00	60.8

Analyzed by Method 6010/7000

CERTIFICATE OF ANALYSIS

ANALYSIS NO: A 1933

CLIENT ID: 008

METALS	MDL (mg/kg)	RESULT (mg/kg)
ALUMINUM	10.0	17100
ANTIMONY	5.00	N.D.
ARSENIC	0.50	10.6
BARIUM	5.00	37.2
BERYLLIUM	1.00	N.D.
CADMIUM	1.00	N.D.
CALCIUM	5.00	4130
CHROMIUM	1.00	28.7
COBALT	5.00	15.2
COPPER	1.00	90.7
IRON	5.00	31400
LEAD	5.00	19.9
MAGNESIUM	5.00	7750
MANGANESE	1.00	672
MERCURY	0.25	N.D.
NICKEL	5.00	21.9
POTASSIUM	50.0	1840
SELENIUM	0.50	N.D.
SILVER	1.00	N.D.
SODIUM	5.00	494
THALLIUM	1.00	N.D.
VANADIUM	5.00	40.6
ZINC	1.00	67.9

Analyzed by Methods 6010/7000

CERTIFICATE OF ANALYSIS

ANALYSIS NO: A 1934

CLIENT ID: 010

METALS	MDL (mg/kg)	RESULT (mg/kg)
ALUMINUM	10.0	17700
ANTIMONY	5.00	N.D.
ARSENIC	0.50	10.1
BARIUM	5.00	37.4
BERYLLIUM	1.00	N.D.
CADMIUM	1.00	N.D.
CALCIUM	5.00	3490
CHROMIUM	1.00	25.8
COBALT	5.00	15.0
COPPER	1.00	25.5
IRON	5.00	32400
LEAD	5.00	14.7
MAGNESIUM	5.00	7490
MANGANESE	1.00	709
MERCURY	0.25	N.D.
NICKEL	5.00	21.5
POTASSIUM	50.0	1850
SELENIUM	0.50	N.D.
SILVER	1.00	N.D.
SODIUM	5.00	486
THALLIUM	1.00	N.D.
VANADIUM	5.00	36.2
ZINC	1.00	68.4

Analyzed by Methods 6010/7000

21st Century Environmental Inc.
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NUMBER	A1936	DILUTION FACTOR	1.00
CLIENT ID	#12 Comp	QA BATCH	
DATA FILE	>A1633	DATE ANALYZED	05/18/93

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Acrolein	ND	56	Bromodichloromethane	ND	6
Acrylonitrile	ND	56	2-Chloroethylvinylether	ND	11
Chloromethane	ND	11	2-Hexanone	ND	11
Bromomethane	ND	11	trans-1,3-Dichloropropene	ND	6
Vinyl Chloride	ND	11	Toluene	ND	6
Chloroethane	ND	11	cis-1,3-Dichloropropene	ND	6
Acetone	3.8 J	11	1,1,2,2-Tetrachloroethane	ND	6
1,1-Dichloroethene	ND	6	1,1,2-Trichloroethane	ND	6
Carbon Disulfide	ND	11	4-Methyl-2-pentanone	ND	11
Methylene Chloride	ND B	6	Tetrachloroethene	ND	6
1,2-Dichloroethene(trans)	ND	6	Dibromochloromethane	ND	6
1,1-Dichloroethane	ND	6	Chlorobenzene	ND	6
Vinyl Acetate	ND	6	Ethylbenzene	ND	6
2-Butanone	ND	11	m&p-Xylenes	ND	6
Chloroform	ND	6	o-Xylene	ND	6
1,1,1-Trichloroethane	ND	6	Styrene	ND	6
Carbon Tetrachloride	ND	6	Bromoform	ND	6
1,2-Dichloroethane	ND	6	m-Dichlorobenzene	ND	6
Benzene	ND	6	p-Dichlorobenzene	ND	6
Trichloroethene	ND	6	o-Dichlorobenzene	ND	6
1,2-Dichloropropane	ND	6			

SURROGATE COMPOUNDS	% RECOVERY	LIMITS	STATUS
1,2-Dichloroethane-d4	108	70 - 121	OK
Toluene-d8	99.9	81 - 117	OK
Bromofluorobenzene	95.0	74 - 121	OK

Percent Solid of 90.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

618 HERON DRIVE P.O. BOX 489 • BRIDGEPORT, NJ 08014-0489 • 609-467-9521

CHEMICAL WASTE MANAGEMENT

PROJECT: INDUSTRI-PLEX

ANALYSIS NO:	CLIENT ID:
A 1937	002
A 1938	005
A 1939	009
A 1940	028

DATE RECEIVED: MAY 12, 1993

TWENTY FIRST CENTURY
ENVIRONMENTAL, INC.

RICHARD W. LYNCH
LABORATORY MANAGER

CERTIFICATE OF ANALYSIS

ANALYSIS NO: A 1937-40 Comp

CLIENT ID: 002, 005, 009 & 028

PARAMETER	MDL (mg/kg)	RESULT (mg/kg)
CYANIDE	0.10	N.D.

Analyzed by Method 9010

CERTIFICATE OF ANALYSIS

TOTAL PETROLEUM HYDROCARBON

ANALYSIS NO:	CLIENT ID:	MDL (mg/kg)	RESULT (mg/kg)
A 1937-40	002, 005, 009 & 028	25.0	97.7

Analyzed by Method 418.1

21ST CENTURY ENVIRONMENTAL
SEMIVOLATILE ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NUMBER	A1937-40COMP	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>C1320	DATE ANALYZED	05/25/93

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
N-Nitrosodimethylamine	ND	370	Acenaphthene	ND	370
Phenol	ND	370	2,4-Dinitrophenol	ND	1800
bis(-2-Chloroethyl)Ether	ND	370	4-Nitrophenol	ND	1800
2-Cholorophenol	ND	370	Dibenzofuran	ND	370
1,3-Dichlorobenzene	ND	370	2,4-Dinitrotoluene	ND	370
1,4-Dichlorobenzene	ND	370	2,6-Dinitrotoluene	ND	370
Benzyl Alcohol	ND	370	Diethylphthalate	ND	370
1,2-Dichlorobenzene	ND	370	4-Chlorophenyl-phenlyether	ND	370
2-Methylphenol	ND	370	Fluorene	ND	370
bis(2-chloroisopropyl)Ether	ND	370	4-Nitroaniline	ND	1800
4-Methylphenol	ND	370	4,6-Dinitro-2-Methylphenol	ND	1800
N-Nitroso-Di-n-Propylamine	ND	370	N-Nitrosodiphenylamine	ND	370
Hexachloroethane	ND	370	4-Bromophenyl-phenylether	ND	370
Nitrobenzene	ND	370	Hexachlorobenzene	ND	370
Isophorone	ND	370	Pentachlorophenol	ND	1800
2-Nitrophenol	ND	370	Phenanthrene	ND	370
2,4-Dimethylphenol	ND	370	Anthracene	ND	370
Benzoic Acid	ND	1800	Di-n-Butylphthalate	ND	370
bis(-2-Chloroethoxy)Methane	ND	370	Fluoranthene	43 J	370
2,4-Dichlorophenol	ND	370	Pyrene	ND	370
1,2,4-Trichlorobenzene	ND	370	Butylbenzylphthalate	ND	370
Naphthalene	ND	370	3,3'-Dichlorobenzidine	ND	730
4-Chloroaniline	ND	370	Benzo(a)Anthracene	ND	370
Hexachlorobutadiene	ND	370	Bis(2-Ethylhexyl)Phthalate	ND	370
4-Chloro-3-Methylphenol	ND	370	Chrysene	ND	370
2-Methylnaphthalene	ND	370	Di-n-Octyl Phthalate	ND	370
Hexachlorocyclopentadiene	ND	370	Benzo(b)Fluoranthene	ND	370
2,4,6-Trichlorophenol	ND	370	Benzo(k)Fluoranthene	ND	370
2,4.5-Trichlorophenol	ND	1800	Benzo(a)Pyrene	ND	370
2-Chloronaphthalene	ND	370	Indeno(1,2,3-cd)Pyrene	ND	370
2-Nitroaniline	ND	1800	Dibenzo(a,h)Anthracene	ND	370
Dimethyl Phthalate	ND	370	Benzo(g,h,i)Perylene	ND	370
Acenaphthylene	ND	370	Benzidine	ND	730
3-Nitroaniline	ND	1800			

Percent Solid of 90.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Lab Sample ID:
A1937-40como

Lab Name: 21ST Century Environmental
Client ID:

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 05/14/93
Date Analyzed: 05/18/93 13:52
Conc/Dil Factor: 10.07g/10mL
Percent Moisture: 10

GPC Cleanup Yes ✓No
Sep. Funnel Extraction Yes
Continuous Liq-Liq Ext. Yes

C.A.S. Number		ug/L or (ug/Kg)
319-84-6	Alpha-BHC.	5.6 U
319-87-7	Beta-BHC	5.6 U
319-86-8	Delta-BHC.	5.6 U
58-89-9	Gamma-BHC (Lindane). . .	5.6 U
76-44-8	Heptachlor	5.6 U
309-00-2	Aldrin	5.6 U
1024-57-3	Heptachlor Epoxide . . .	5.6 U
959-98-8	Endosulfan I	5.6 U
60-57-1	Dieldrin	5.6 U
72-55-9	4,4'-DDE	5.6 U
72-20-8	Endrin	5.6 U
33213-65-9	Endosulfan II.	11 U
72-54-8	4,4'-DDD	11 U
1031-07-8	Endosulfan Sulfate . . .	11 U
50-29-3	4,4'-DDT	11 U
72-43-5	Methoxychlor	280 U
7421-93-4	Endrin Aldehyde.	11 U
57-74-9	Chlordane.	280 U
8001-35-2	Toxaphene.	560 U
12674-11-2	Aroclor-1016.	280 U
11104-28-2	Aroclor-1221.	280 U
11141-16-5	Aroclor-1232.	280 U
53469-21-9	Aroclor-1242.	280 U
12672-29-6	Aroclor-1248.	280 U
11097-69-1	Aroclor-1254.	280 U
11096-82-5	Aroclor-1260.	280 U

U Undetected J Estimated value below detection level

Analyzed by Method 8080

CHAIN OF CUSTODY RECORD

Proj. No.	Project Name
492900	Industri - Plex

Samplers (Signature)
William Spedding

Sample #	Date	Time	Comp.	Grab	Sample Description	No. of Containers	TAL Metals	TCL Volatiles			Remarks
004	4/13	04:15	✓		Soil	1 (8oz.)	X				East Side
008	4/21	01:30	✓		Soil	1 (8oz.)	X				Broken Entire Stockpile
010	5/4	17:15	✓		Soil	1 (8oz.)	X				West Side
011	5/4	17:30	✓		Soil	1 (8oz.)		X			
012	5/4	17:40	✓		Soil	1 (40ml)		X			

- Deer Island Stockpile #3
- See Attached Analysis Sheet
- 2 week turnaround
- Samples #11 and [redacted] #12 should be treated as one sample

Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
William Spedding	5/11/93 5:05pm			
Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time	Received for Laboratory by:	Remarks	

2 week turnaround

617 - 938 - 7190

1-26-1993 10:01 FROM CWM ERD P. 1

Deer Island #3

CHAIN OF CUSTODY RECORD

Proj. No.	Project Name											
492900	Industri - Plex											- Deer Island Stockpile #3 - See Attached Analysis Sheet - 2 week turnaroun
Samplers (Signature) William Spedding												
Sample #	Date	Time	Comp.	Grab	Sample Description	No. of Containers	TAL Metals					Remarks
001	4/1	19:35	✓		Soil	one 8oz. jar	X					To replace #008

Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time	Received for Laboratory by:	Remarks	

2 week turnaround

#(417)-938-7190

1.26.1993 10:01 P.1 FROM CWM ERD

CHAIN OF CUSTODY RECORD

Proj. No.	Project Name
492900	Industri-Plex

Samplers (Signature)
William Spedding

- Deer Island Stockpile #3
- See Attached Analysis Sheet
- 2 week turnaroun

Sample #	Date	Time	Comp.	Grab	Sample Description	No. of Containers	Remarks
002	4/12	19:45	✓		Soil	1 8oz. Jar	Samples # 002,
005	4/13	09:20	✓		Soil	1 8oz. Jar	005, 009 and
009	4/21	02:00	✓		Soil	1 8oz. Jar	028 should be
028	5/11	15:57	✓		Soil	1 8oz. Jar	treated as one
							sample

Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
William Spedding	5/11/93 5:10pm			
Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time	Received for Laboratory by:	Remarks	

2 week turnaround

617-938-7190

1.26.1995 10:41 FROM OWM ERO

618 HERON DRIVE, P.O. BOX 489 • BRIDGEPORT, NJ 08014-0489 • 609-467-9521

CHEMICAL WASTE MANAGEMENT

PROJECT: INDUSTRI-PLEX

ANALYSIS NO:	CLIENT ID:
A 1947	019
A 1948	022
A 1949	025
A 1950	020
A 1951	023
A 1952	026

DATE RECEIVED: MAY 14, 1993

TWENTY FIRST CENTURY
ENVIRONMENTAL, INC.

RICHARD W. LYNCH
LABORATORY MANAGER

Page 1 of 4
Deer Island #4

A1947-A1952

CHAIN OF CUSTODY RECORD

Proj. No.	Project Name
492900	Industri-Plex

Samplers (Signature)
William Spedding

Sample #	Date	Time	Comp.	Grab	Sample Description	No. of Containers	TAL Metals	ACID/BASE Neutrals (TCL)	Pesticides (TCL)	Cyanide	TPH	Remarks
019	5/7	5:05	✓		Soil	one 8oz. jar	X					East Side
022	5/8	4:58	✓		Soil	one 8oz. jar	X					West Side
025	5/11	5:10	✓		Soil	one 8oz. jar	X					Entire Stockpile
020	5/7	5:10	✓		Soil	one 8oz. jar		X	X	X	X	Entire Stockpile
023	5/8	5:10	✓		Soil	one 8oz. jar		X	X	X	X	Entire Stockpile
026	5/11	5:20	✓		Soil	one 8oz. jar		X	X	X	X	Entire Stockpile

treat as one sample or analysis purposes

- Deer Island Stockpile #4
- See Attached Analysis Sheet
- 2 week turnaround

Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
William Spedding	5/13 9:30			
Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time	Received for Laboratory by:	Remarks	
	5/14/93 1330	Lynda Carlet		

2 week turnaround

#( )-938-7190

CERTIFICATE OF ANALYSIS

ANALYSIS NO: A 1947

CLIENT ID: 019

METALS	MDL (mg/kg)	RESULT (mg/kg)
ALUMINUM	10.0	15500
ANTIMONY	5.00	N.D.
ARSENIC	0.50	8.19
BARIUM	5.00	40.2
BERYLLIUM	1.00	N.D.
CADMIUM	1.00	N.D.
CALCIUM	5.00	3330
CHROMIUM	1.00	23.9
COBALT	5.00	13.7
COPPER	1.00	26.6
IRON	5.00	30200
LEAD	5.00	18.2
MAGNESIUM	5.00	6880
MANGANESE	1.00	662
MERCURY	0.25	N.D.
NICKEL	5.00	21.2
POTASSIUM	50.0	1650
SELENIUM	0.50	N.D.
SILVER	1.00	N.D.
SODIUM	5.00	434
THALLIUM	1.00	N.D.
VANADIUM	5.00	34.7
ZINC	1.00	69.0

Analyzed by Methods 6010/7000

CERTIFICATE OF ANALYSIS

ANALYSIS NO: A 1950-52

CLIENT ID: 020, 023 & 026

PARAMETER	MDL (mg/kg)	RESULT (mg/kg)
CYANIDE	0.10	N.D.

* Analyzed by Method 9010

CERTIFICATE OF ANALYSIS

TOTAL PETROLEUM HYDROCARBON

ANALYSIS NO:	CLIENT ID:	MDL (mg/kg)	RESULT (mg/kg)
A1950-52	020, 023 & 026	25.0	50.5

Analyzed by method 418.1

21ST CENTURY Environmental
SEMIVOLATILE ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NUMBER	A1950-2 COMPOSITE	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	)C1352	DATE ANALYZED	05/27/93

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
N-Nitrosodimethylamine	ND	370	Acenaphthene	ND	370
Phenol	ND	370	2,4-Dinitrophenol	ND	1800
bis(-2-Chloroethyl)Ether	ND	370	4-Nitrophenol	ND	1800
2-Cholorophenol	ND	370	Dibenzofuran	ND	370
1,3-Dichlorobenzene	ND	370	2,4-Dinitrotoluene	ND	370
1,4-Dichlorobenzene	ND	370	2,6-Dinitrotoluene	ND	370
Benzyl Alcohol	ND	370	Diethylphthalate	ND	370
1,2-Dichlorobenzene	ND	370	4-Chlorophenyl-phenlyether	ND	370
2-Methylphenol	ND	370	Fluorene	ND	370
bis(2-chloroisopropyl)Ether	ND	370	4-Nitroaniline	ND	1800
4-Methylphenol	ND	370	4,6-Dinitro-2-Methylphenol	ND	1800
N-Nitroso-Di-n-Propylamine	ND	370	N-Nitrosodiphenylamine	ND	370
Hexachloroethane	ND	370	4-Bromophenyl-phenylether	ND	370
Nitrobenzene	ND	370	Hexachlorobenzene	ND	370
Isophorone	ND	370	Pentachlorophenol	ND	1800
2-Nitrophenol	ND	370	Phenanthrene	ND	370
2,4-Dimethylphenol	ND	370	Anthracene	ND	370
Benzoic Acid	ND	1800	Di-n-Butylphthalate	ND	370
bis(-2-Chloroethoxy)Methane	ND	370	Fluoranthene	ND	370
2,4-Dichlorophenol	ND	370	Pyrene	ND	370
1,2,4-Trichlorobenzene	ND	370	Butylbenzylphthalate	ND	370
Naphthalene	ND	370	3,3'-Dichlorobenzidine	ND	730
4-Chloroaniline	ND	370	Benzo(a)Anthracene	ND	370
Hexachlorobutadiene	ND	370	Bis(2-Ethylhexyl)Phthalate	ND	370
4-Chloro-3-Methylphenol	ND	370	Chrysene	ND	370
2-Methylnaphthalene	ND	370	Di-n-Octyl Phthalate	ND	370
Hexachlorocyclopentadiene	ND	370	Benzo(b)Fluoranthene	ND	370
2,4,6-Trichlorophenol	ND	370	Benzo(k)Fluoranthene	ND	370
2,4,5-Trichlorophenol	ND	1800	Benzo(a)Pyrene	ND	370
2-Chloronaphthalene	ND	370	Indeno(1,2,3-cd)Pyrene	ND	370
2-Nitroaniline	ND	1800	Dibenzo(a,h)Anthracene	ND	370
Dimethyl Phthalate	ND	370	Benzo(g,h,i)Perylene	ND	370
Acenaphthylene	ND	370	Benzidine	ND	730
3-Nitroaniline	ND	1800			

Percent Solid of 90.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Analyzed by Method 8270

Page 3 of 4

Deer Island #4

A1958 - A1957

CHAIN OF CUSTODY RECORD

Proj. No.	Project Name
492900	Industri - Plex

Samplers (Signature) William Spedding

Sample #	Date	Time	Comp.	Grab	Sample Description	No. of Containers	TCL Volatiles				Remarks
treat as one sample for analysis purposes											- Deer Island Stockpile #4 - See Attached Analysis Sheet - 2 week turnaround
015	5/5	5:20		✓	Soil	One 40 mil	X				
018	5/6	6:20	✓		Soil	One 40 mil	X				
021	5/7	5:15	✓		Soil	One 40 mil	X				
024	5/8	5:15	✓		Soil	One 40 mil	X				
027	5/11	5:26	✓		Soil	One 40 mil	X				

Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time 5/14 1330	Received for Laboratory by: Lynda Carter	Remarks	

2 week turnaround

(617) 938-7190

FEB-18-1992 07:31 FROM TO 16179387190 P.12

21st Century Environmental Inc.
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NUMBER	A1953 Comp	DILUTION FACTOR	1.00
CLIENT ID		DA BATCH	
DATA FILE	>B1644	DATE ANALYZED	05/19/93

COMPOUND	UG/KG		MDL	COMPOUND	UG/KG	MDL
Acrolein	ND		56	Bromodichloromethane	ND	6
Acrylonitrile	ND		56	2-Chloroethylvinylether	ND	11
Chloromethane	ND		11	2-Hexanone	ND	11
Bromomethane	ND		11	trans-1,3-Dichloropropene	ND	6
Vinyl Chloride	ND		11	Toluene	ND	6
Chloroethane	ND		11	cis-1,3-Dichloropropene	ND	6
Acetone	ND	B	11	1,1,2,2-Tetrachloroethane	ND	6
1,1-Dichloroethene	ND		6	1,1,2-Trichloroethane	ND	6
Carbon Disulfide	ND		11	4-Methyl-2-pentanone	ND	11
Methylene Chloride	3.1	JB	6	Tetrachloroethene	ND	6
1,2-Dichloroethene(trans)	ND		6	Dibromochloromethane	ND	6
1,1-Dichloroethane	ND		6	Chlorobenzene	ND	6
Vinyl Acetate	ND		6	Ethylbenzene	ND	6
2-Butanone	ND		11	m&p-Xylenes	ND	6
Chloroform	ND		6	o-Xylene	ND	6
1,1,1-Trichloroethane	ND		6	Styrene	ND	6
Carbon Tetrachloride	ND		6	Bromoform	ND	6
1,2-Dichloroethane	ND		6	m-Dichlorobenzene	ND	6
Benzene	ND		6	p-Dichlorobenzene	ND	6
Trichloroethene	ND		6	o-Dichlorobenzene	ND	6
1,2-Dichloropropane	ND		6			

SURROGATE COMPOUNDS	% RECOVERY	LIMITS	STATUS
1,2-Dichloroethane-d4	97.9	70 - 121	OK
Toluene-d8	97.8	81 - 117	OK
Bromofluorobenzene	97.5	74 - 121	OK

Percent Solid of 90.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

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CHEMICAL WASTE MANAGEMENT

PROJECT: INDUSTRI-PLEX

ANALYSIS NO:	CLIENT ID:
A 1953	015
A 1954	018
A 1955	021
A 1956	024
A 1957	027

DATE RECEIVED: MAY 14, 1993

TWENTY FIRST CENTURY
ENVIRONMENTAL, INC.

RICHARD W. LYNCH
LABORATORY MANAGER

Lab Sample ID: A1950-52como

Lab Name: 21ST Century Environmental
Client ID:

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Concentration: Low Medium (Circle One)
Date Extracted/Prepared: 05/18/93
Date Analyzed: 05/18/93 16:48
Conc/Dil Factor: 10.09g/10mL
Percent Moisture: 10

GPC Cleanup Yes No
Sep. Funnel Extraction Yes
Continuous Liq-Liq Ext. Yes

C.A.S. Number		ug/L ~~or~~ ug/Kg
319-84-6	Alpha-BHC.	5.6 U
319-87-7	Beta-BHC	5.6 U
319-86-8	Delta-BHC.	5.6 U
58-89-9	Gamma-BHC (Lindane). . .	5.6 U
76-44-8	Heptachlor	5.6 U
309-00-2	Aldrin	5.6 U
1024-57-3	Heptachlor Epoxide . . .	5.6 U
959-98-8	Endosulfan I	5.6 U
60-57-1	Dieldrin	5.6 U
72-55-9	4,4'-DDE	5.6 U
72-20-8	Endrin	5.6 U
33213-65-9	Endosulfan II.	11 U
72-54-8	4,4'-DDD	11 U
1031-07-8	Endosulfan Sulfate . . .	11 U
50-29-3	4,4'-DDT	11 U
72-43-5	Methoxychlor	280 U
7421-93-4	Endrin Aldehyde.	11 U
57-74-9	Chlordane.	280 U
8001-35-2	Toxaphene.	560 U
12674-11-2	Aroclor-1016.	280 U
11104-28-2	Aroclor-1221.	280 U
11141-16-5	Aroclor-1232.	280 U
53469-21-9	Aroclor-1242.	280 U
12672-29-6	Aroclor-1248.	280 U
11097-69-1	Aroclor-1254.	280 U
11096-82-5	Aroclor-1260.	280 U

U Undetected J Estimated value below detection level

Analyzed by Method 8080

CERTIFICATE OF ANALYSIS ok

ANALYSIS NO: A 1948

CLIENT ID: 022

METALS	MDL (mg/kg)	RESULT (mg/kg)
ALUMINUM	10.0	14700
ANTIMONY	5.00	N.D.
ARSENIC	0.50	2.96
BARIUM	5.00	34.3
BERYLLIUM	1.00	1.14
CADMIUM	1.00	N.D.
CALCIUM	5.00	3590
CHROMIUM	1.00	21.6 ok
COBALT	5.00	12.7
COPPER	1.00	25.9
IRON	5.00	27100
LEAD	5.00	12.9
MAGNESIUM	5.00	6470
MANGANESE	1.00	635
MERCURY	0.25	N.D.
NICKEL	5.00	19.9
POTASSIUM	50.0	1250
SELENIUM	0.50	N.D.
SILVER	1.00	N.D.
SODIUM	5.00	517
THALLIUM	1.00	N.D.
VANADIUM	5.00	30.3
ZINC	1.00	62.5

Analyzed by Methods 6010/7000

CERTIFICATE OF ANALYSIS

ANALYSIS NO: A 1949

CLIENT ID: 025

METALS	MDL (mg/kg)	RESULT (mg/kg)
ALUMINUM	10.0	15700
ANTIMONY	5.00	N.D.
ARSENIC	0.50	8.55
BARIUM	5.00	34.7
BERYLLIUM	1.00	N.D.
CADMIUM	1.00	N.D.
CALCIUM	5.00	3380
CHROMIUM	1.00	22.4
COBALT	5.00	13.5
COPPER	1.00	27.4
IRON	5.00	29400
LEAD	5.00	16.2
MAGNESIUM	5.00	6670
MANGANESE	1.00	631
MERCURY	0.25	N.D.
NICKEL	5.00	21.0
POTASSIUM	50.0	1970
SELENIUM	0.50	N.D.
SILVER	1.00	N.D.
SODIUM	5.00	485
THALLIUM	1.00	N.D.
VANADIUM	5.00	33.1
ZINC	1.00	101

Analyzed by Methods 6010/7000

INDUSTRI-PLEX SITE

REMEDIAL TRUST

41 ATLANTIC AVENUE
WOBURN, MA 01801

March 16, 1993

Subject: Deer Island Soils

(1) The EPA & MDEP support the use of Deer Island soil for cover at Industri-Plex.
- Joe DeCola - EPA Remedial Project Manager for Industri-Plex.
- Jay Naparstek - MDEP Project Manager for Industri-Plex.
- Steve Lipman - MDEP Environmental Engineer

(2) Several independent studies have shown that the soils designated for use at Industri-Plex are clean:

A. "Deer Island; Boston, Mass. Evaluation of Glacial Till Soil Samples" by McPhail Associates, Inc. Geotechnical Engineers, for J.M. Cashman Inc. dated Sept. 10, 1990 and follow-up evaluation letter dated Sept. 18, 1992.
B. "Central Drumlin and Glacial Till Characterization" by HMM Associates, Inc. for Mass. Water Resources Authority dated Feb. 3, 1993.
C. "Soil Quality-Glacial Till Soil Sample Analysis, Deer Island, Boston, MA. and Use of Soils at Industri-Plex Site, Woburn, MA." by HMM Associates for Chemical Waste Management, Inc. dated Feb. 5, 1993.
D. "Analytical Report On Deer Island Soil Samples" by Bridgeport Environmental Inc. for Chemical Waste Management, Inc. dated Oct. 15, 1992 and Feb. 5, 1993.

(3) A sampling plan and a "clean soil criteria" has been developed and approved by the Agencies to insure the continued procurement of clean soils. Adherence to the plan will be monitored by the EPA and MDEP.

(4) Since the Remedial Trust is responsible for initially providing and PERPETUALLY MAINTAINING a clean soil cover, in compliance with the approved remedial action, there are compelling incentives to do it right the first time. The Remedial Trust will not compromise on the quality of the cover soils.

Sincerely,

D. M. Light by D.K.

D. Michael Light
ISRT Project Coordinator

0700.201.007
Deer Island

TEL. 617-932-9599
FAX 617-932-9589

INDUSTRI-PLEX SITE

REMEDIAL TRUST

WOBURN, MASSACHUSETTS

March 10, 1993

Mr. J. M. DeCola
Remedial Project Manager
Waste Management Division
USEPA
JFK Federal Bldg., HRS-CANZ
Boston, MA 02202-2211

Dear Joe:

In each of our Site Progress Meetings in December, January and February, the issue of soil from Deer Island has been raised. On December 3, 1992, I sent you a letter outlining the testing and analyzing that the Trust planned to conduct to verify the suitability of this soil for use on the Industri-Plex Site.

At the January meeting, agreement was reached between the Agencies and the Trust for the testing of the Deer Island soil already on site as well as the testing of future deliveries of soil from this or other sources. The threshold levels of "contaminants" for soil to be acceptable for use at Industri-Plex were also agreed upon.

At the February meeting, the on-site soil from Deer Island was accepted by the Agencies as "clean" based on additional testing to resolve an "antimony discrepancy". All other constituents were below the threshold levels on all tests.

Also, in February, it came to the Trust's attention that Stephen Lipman of MDEP was advocating the use of natural glacial till from Deer Island, such as the soil that the Trust is proposing. Further, Mr. Lipman had contacted Jay Naporstek to express his support of the use of Deer Island soil if the testing measures which we have agreed upon are followed. It is our understanding that based on extensive testing at Deer Island, MDEP recommends the use of the natural glacial till from that site for cover projects such as ours.

It is the Trust's position that the Deer Island soil meets all the high standards that the Agencies have approved for the soil cover. We request that the USEPA join the MDEP in supporting the use of Deer Island Soil.

Sincerely,

D. L. Baumgartner
Project Manager

DLB:cs

cc: J. Naporstek - MDEP
G. Bullard - HNUS
D. M. Light - ISRT
T. D. Kling - ISRT

Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Protection

William F. Weld
Governor
Daniel S. Greenbaum
Commissioner

March 12, 1993

David Baumgartner
Industri-Plex Site
41 Atlantic Ave.
Woburn, MA 01801

Re: Woburn, Industri-Plex Site
Use of Deer Island Glacial Till

Dear Mr. Baumgartner:

This correspondence is intended to respond to your telephone calls of March 11th and 12th relative to DEP's position on the use of the glacial till as cover at the Industri-Plex Site in Woburn which is being excavated on Deer Island and removed from the site by J. M. Cashman, Inc. Appended to this letter is February 3, 1993, correspondence from HMM associates to MWRA which provides documentation relative to the contaminant quality of the glacial till soil and information relative to historic site contamination at Deer Island. Staff from DEP were involved in all aspects of the site assessment and soil testing work described in the HMM correspondence, and I can verify the accuracy of the statements made by HMM.

As you are aware, as part of DEP's Bureau of Waste Site Cleanup oversight of the Industri-Plex remediation work, a procedure of ongoing confirmatory sampling of soil being received at the Industri-Plex Site is being performed (See appended Memorandum from Peter Neumann).

Due to the glacial tills low permeability, this soil is ideal for capping of landfills or 21E sites. This writer has not seen any information which indicates that the Deer Island till has contamination which would place any restrictions on its use.

One Winter Street • Boston, Massachusetts 02108 • FAX (617) 556-1049 • Telephone (617) 292-5500

Feel free to contact me if you have any further questions regarding this issue.

Very truly yours,

Steven G. Lipman, P.E.
Boston Harbor Coordinator

SGL/md

cc: Iris Davis, DEP/BWSC

bauwo.doc

TO: Trustee Representative DATE: 1/21/92
FROM: Peter Neumann JOB NUMBER: 903-6400
RE: Proposed Soil sampling methods for off-site soils. PAGE 2 of 2

4. Quarried and processed aggregate such as aggregate sub-base, aggregate stone and rip-rap will not need analytical testing. OVA screening in the manner described above will be conducted at the stockpiles only.

5. Each batch of approximately 6,000 cubic yards of material will be kept separated from other stockpiles until analytical results indicates the soil does not exceed the clean soil threshold values.

6. An example of Standard Mixing Protocol for non-volatile analytes;

The following equipment and materials are required to perform this procedure:

- Stainless steel spoon;
- Stainless steel mixing pan or bowl; and
- Stainless steel spatula

Procedure:

All sample handling equipment must be decontaminated in accordance with the project decontamination procedures. When soil samples are collected enough sample should be collected to fill the liter or quart sample jars. Any rocks, twigs, leaves or other debris should be removed.

VOC samples should be collected prior to any mixing of the sample. The sample should be placed in the VOC jars as reproducibly as possible without mixing.

Prior to filling the remaining sample jars, the sample should be homogenized according to the procedure given below. The sample should be scraped from the sides, bottom, and any corners of the pan or bowl and rolled into the middle of the mass using a stainless steel spoon. The mass of sample should be mixed thoroughly. The sample should be divided into four equal quarters, which should be moved to separate parts of the pan or bowl. Each quarter should be individually mixed. The four quarters should be recombined, and the entire mass mixed. The final sampling will be from three locations of the final mass mixture.

MEMORANDUM

TO: Trustee Representative DATE: 1/21/92
FROM: Peter Neumann JOB NUMBER: 903-6400
RE: Proposed Soil sampling methods for off-site soils. PAGE 1 of 2

The following soil sampling method and frequencies are based on discussions at a meeting with the EPA and MDEP at the ISRT site on 1/21/93. The methods of sampling for analytical testing are proposed to verify that the off-site soils brought on the site are "clean" in accordance with Section 02223 2.07 of the 100% Design Specifications for ISRT.

1. Initial conformance sampling for testing of proposed soils shall consist of one composite sample following standard sampling and mixing protocols from each source. The volatile organic sample jar must be completely filled with no mixing.

2. To "screen" the soils brought on-site additional sampling will be conducted in the following manner.

   One composite sample will be taken for every 6,000 cubic yards of material brought on site. The composite sample will be tested for **Semi-volatiles, Pesticides and Metals**. The composite sample will be comprised of 5 well mixed 1 liter or quart size samples taken near the end of the day or 1 sample for each 1200 cubic yards from a series of soil delivery days. The final composite sample shall be taken from 3 locations of the well mixed 5 quart composite sample. Standard sampling and mixing protocols must be followed (See page 2 for example of standard mixing/sampling procedures). Therefore one composite sample will be tested for approximately 6,000 cubic yards.

   The sample tested for **volatiles** (VOC) must be sampled every day at the same time as the liter or quart sample and placed in an airtight 40 milliliter glass vial. At the end of the 6,000 cubic yard delivery or within the time limit of the test holding times, the combined 5 vials will be sent to the analytical laboratory as <u>one sample</u> and tested. The test will be comprised of the combined soil in the five sample vials. The volatile samples will not be mixed prior to delivery to the laboratory.

3. Organic Vapor Analyzer OVA sampling will be conducted at the stock pile for screening purposes at the following frequencies. A random test of the soils arriving by truck will be screened every two hours. Once stockpiled the soil will be around the perimeter of the stockpile once every twenty lineal feet. The method of screening will include removing a minimum of 1 foot of soil from the pile and probing the exposed soil with the tip of the OVA without the probe actually touching the soil.

I N T E R O F F I C E M E M O R A N D U M

Date: 16-Mar-1993 10:54am CST
From: D. Michael Light
LIGHT, D. MICHAEL
Dept: MCC Environmental Operation
Tel No: 314-694-1617

TO: Thomas Dale Kling (KLING, THOMAS DALE)

Subject: Deer Island Soil

(1) The EPA & MDEP support the use of Deer Island soil for cover at Industri-plex.
- Joe Decola - EPA Remedial Project Manager for Industriplex
- Jay Neparstek - MDEP Project Manager for Industri-plex
- Steve Lipman - MDEP

(2) Several independent studies have shown that the soils designated for use at Industriplex are clean:

(List studies)

(3) A sampling plan and a "clean soil criteria" has been developed to insure the continued procurement of clean soils. Adherence to the plan will be monitored by the EPA and the MDEP.

(4) Since the Remedial Trust is responsible for initially providing and PERPETUALLY MAINTAINING a clean soil cover, in compliance with the approved remedial action, there are compelling incentives to do it right the first time. The Remedial Trust will not compromise on the quality of the cover soils.

INDUSTRI-PLEX SITE

REMEDIAL TRUST

41 ATLANTIC AVENUE
WOBURN, MA

March 16, 1993

Subject: Positions On Deer Island Soils

The Massachusetts Dept. of Environmental Protection has been closely involved in the evaluation of data that has lead to a determination that Deer Island soil is clean and safe to use as capping soil. Mr. Steve Lipman at MDEP has been the key person in this evaluation and has had extensive discussions with Jay Naparstek advocating the use of this soil at Industri-Plex. Jay Naparstek has worked with the Industri-Plex to establish a "clean soil criteria" and a sampling/analysis plan to insure that the Deer Island soil being used is clean.

Position

The EPA Project Manager Joe DeCola has also agreed to the use of Deer Island soils and has approved the "clean soil criteria" and sampling/analysis plan. Both Jay and Joe on January 11, 1993 traveled to Deer Island to inspect the source of the soil and are both in full support of this material.

A number of Consultants have been retained by various parties to investigate the Deer Island soils, and all have found this soil to be free from contamination. The following list will identify this documentation:

A. "Deer Island; Boston, Mass. Evaluation of Glacial Till Soil Samples" by McPhail Associates, Inc. Geotechnical Engineers, for J.M. Cashman Inc. dated Sept. 10, 1990 and follow-up evaluation letter dated Sept. 18, 1992.
B. "Central Drumlin and Glacial Till Characterization" by HMM Associates, Inc. for Mass. Water Resources Authority dated Feb. 3, 1993.
C. "Soil Quality-Glacial Till Soil Sample Analysis, Deer Island, Boston, MA. and Use of Soils at Industri-Plex Site, Woburn, MA." by HMM Associates for Chemical Waste Management, Inc. dated Feb. 5, 1993.
D. "Analytical Report On Deer Island Soil Samples" by Bridgeport Environmental Inc. for Chemical Waste Management, Inc. dated Oct. 15, 1992 and Feb. 5, 1993.

The above documentation is on file at the Industri-Plex office in Woburn and is avaliable for review.

Sincerely,

D. Michael Light
ISRT Project Coordinator

TEL. 617-932-9599
FAX 617 932-9589

INDUSTRI-PLEX SITE REMEDIAL TRUST
41 ATLANTIC AVENUE
WOBURN, MA 01801

March 15, 1993

Mr. Joseph N. DeCola
EPA Project Manager

Mr. Jay Naparstek
MDEP, Project Manager

Mr. Gordon Bullard
Halliburton NUS

Subject: Weekly Planned Activities (March 15-19)

Gentlemen:

We plan to continue work on the well decommisioning this week, as weather and conditions allow. We plan to drop from 4 drill rigs to 2 drill rigs for this week. No work is going on today (Monday) due to snow accumulations. Tomorrow we will attempt to get started again and plan on starting OW-18, OW-18A OW-19, OW-19A, PD-4, and BH-25.

While the above work is the only direct remedy work planned, there are a number of ancillary tasks planned for this week. They are:

1. Snow removal.
2. Open the East portal of the tunnel for visual inspection.
3. Move the stored pre-cast tunnel liners for access to OW-38 and the concrete underground storage tanks.
4. Develop responses to agency comments on RAWP.
5. Meet with the thermal oxidation unit vendor (NAO Inc.) to review submittal and discuss the addition of a building to protect the unit.

Sincerely,

Dale Kling
Site Manager

Note: Project Contractors and ISRT are preparing to meet with the Agencies on Monday, March 22, 1993 to discuss the comments submitted.

cc: Dave Baumgartner ISRT

TEL. 617-932-9599
FAX 617-932 9589

CHEMICAL WASTE MANAGEMENT, INC.
100 Nassau Park Boulevard
PRINCETON, NEW JERSEY 08540
Telephone: (609) 243-7800

LETTER OF TRANSMITTA

DATE: December 2, 1992 JOB NO. 67300
ATTENTION: T. Dale Kling
RE:

TO Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

GENTLEMEN:

WE ARE SENDING YOU: ☒ Attached ☐ Under separate cover via _____ the following iten

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☒ Copy of letter ☐ Change Order ☒ Analytical Results

COPIES	DATE	No.	DESCRIPTION
1	11/09/92		Cashman Letter
1	02/22/92		McPhail Letter
1	09/10/92		McPhail Letter
1	10/15/92		Bridgeport Environmental Lab Analytical Results

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit ____ copies for approval
☒ For your use ☐ Approved as noted ☐ Submit ____ copies for distribution
☒ As requested ☐ Returned for corrections ☐ Return ____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____, 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

COPY TO File

SIGNED John W. Hoff
John W. Hoff, Project Manager

If enclosures are not as noted, kindly notify us at once.

c:\trnsmtl.jwh

J. M. Cashman, Inc. Marine and General Contractor

November 9, 1992

Mr. John Hoff
C.W.M. Remedial Services
Group, Inc.
41 Atlantic Avenue
Woburn, MA 0180[illegible]

Re: Supply of Fill Material to Woburn

Dear Mr. Hoff:

The material being furnished for the Industri-plex project is native glacial till. The material is from Deer Island and is being screened to meet the various fill specifications for the project.

If you have any questions, please contact this office.

Very truly yours,
J.M. CASHMAN, INC.

Bruce Wood
Project Manager

BW/JB

77 Federal Avenue, P.O. Box 1070, Quincy, MA 02269-2070 Telephone (617) 471-1500 Fax (617) 770-9768

McPHAIL ASSOCIATES, INC.
Geotechnical Engineers

February 22, 1991

J. M. Cashman, Inc.
77 Federal Avenue
Quincy, MA 02169

Attention: Mr. Bruce Wood

Reference: Deer Island; Boston, Massachusetts
Permeability of Excavated Soil

Gentlemen:

Enclosed are the two gradations of the samples of gray and brown glacial till submitted on February 6, 1991 from your Deer Island contract for permeability testing as it relates to potential utilization of the surplus excavated material as permanent cover material for final closure of landfills in accordance with current Massachusetts Department of Environmental Protection criteria.

For practical purposes, the two submitted samples of gray and brown glacial till are gradationally equivalent, the only difference being the brown color of the shallower sample which is attributable to oxidation (i.e. weathering). The results of our gradation analysis performed on these samples indicated that they contained between 50 and 54 percent by dry weight passing the No. 200 sieve.

Based on two test results on a sample of the gray till compacted to 92 percent of maximum dry density (per ASTM D1557) in a compaction permeameter, the average laboratory permeability is 2.6×10^{-6} cm./sec.

By comparison, the two samples submitted for permeability testing during August of 1990 exhibited permeability test results ranging from 5×10^{-4} to 7×10^{-4} cm/sec. However, both of the previously submitted samples contained approximately 40 percent passing the No. 200 sieve.

30 Norfolk Street
Cambridge, Massachusetts 02139
617/868-1420

McPHAIL ASSOCIATES, INC.
Geotechnical Engineers

The permeability of the material represented by the soil samples submitted on February 6, 1991, is somewhat lower than the current DEP criterion for permanent cover material of $1x10^{-7}$ cm./sec. Accordingly, the surplus excavated soil from Deer Island represented by the submitted samples is considered to be sufficiently impermeable to be utilized as permanent cover material for final closure of landfills in Massachusetts in accordance with current DEP criteria.

Should you have any questions, please call us.

Very truly yours,

McPHAIL ASSOCIATES, INC.

Ambrose J. Donovan

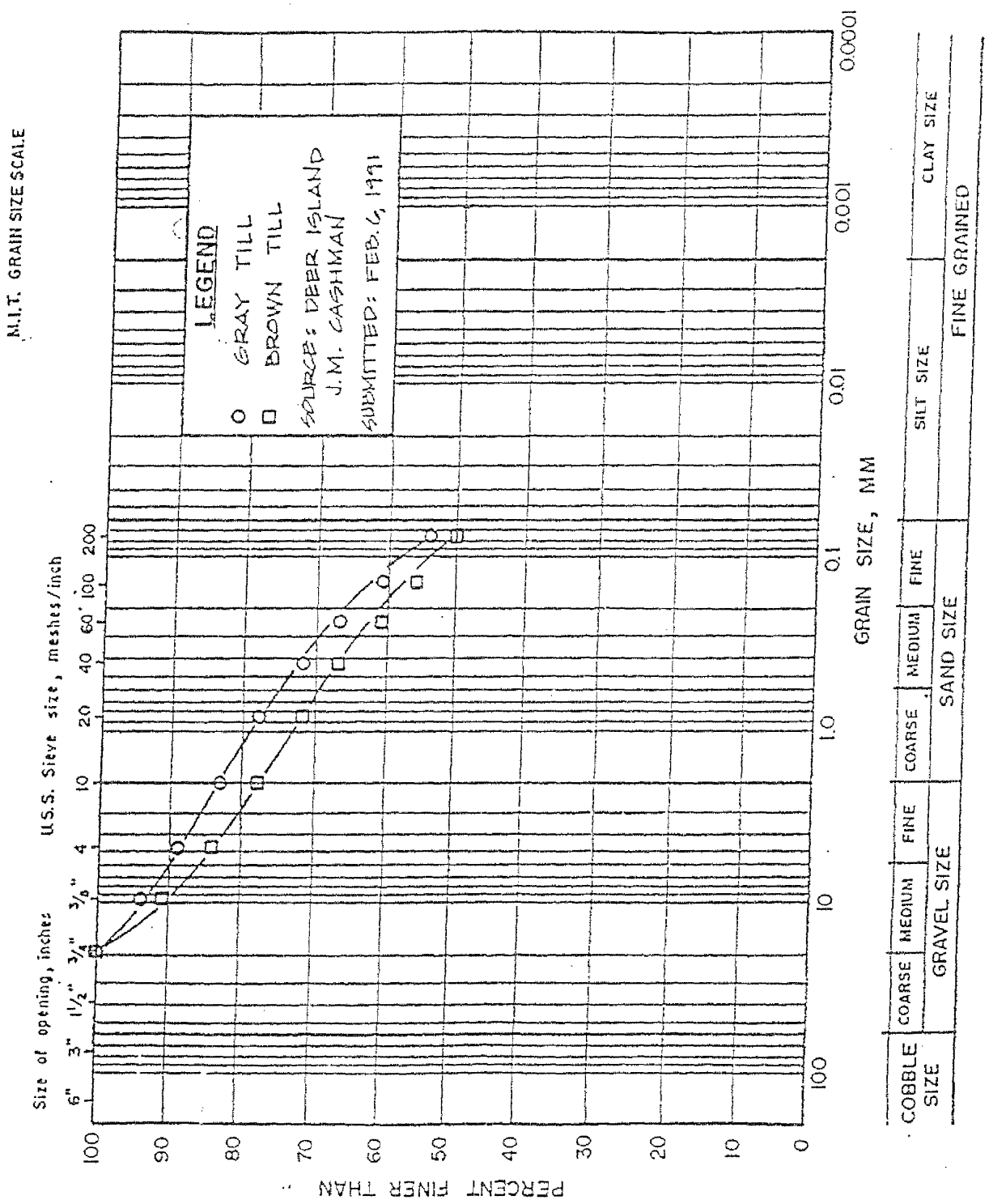
Robert C. Hoyler, P.E.

Enclosure

2301

AJD/jrm

GRAIN SIZE DISTRIBUTION	FIGURE



McPHAIL ASSOCIATES INC.

McPHAIL ASSOCIATES, INC.
Geotechnical Engineers

September 10, 1990

J. M. Cashman, Inc.
77 Federal Avenue
Quincy, MA 02169

Attention: Mr. Bruce Wood

Reference: Deer Island; Boston, Massachusetts
Evaluation of Glacial Till Soil Samples

Gentlemen:

In response to your recent request, samples of the on-site natural glacial till from the Deer Island project site were submitted for chemical analysis as a check for the absence of common environmental contaminants so that the glacial till soil could be disposed of off-site as unregulated soil in accordance with current Massachusetts Department of Environmental Protection and U.S. Environmental Protection Agency criteria.

In addition, we are also commenting on the suitability of the glacial till for re-use as structural fill.

Selection of the specific chemical tests was oriented towards detecting a broad range of common environmental contaminants including volatile organics, pesticides and PCB's, heavy metals and petroleum hydrocarbons.

Results of these chemical analyses are enclosed herewith. Following is a discussion of these test results.

A. Volatile Organic Chemical Analysis

A sample of the natural glacial till was analyzed for the presence of volatile organics in accordance with EPA Method 8260 to provide an indication of the presence of volatile halocarbons and volatile aromatics.

Results indicated that the levels of volatile organics in the soil were below their respective method detection limits.

Hence, it is considered that volatile organics do not have a present impact or threat of impact on the glacial till soils at the site.

30 Norfolk Street
Cambridge, Massachusetts 02139
617/868-1420

B. Pesticides/PCB's Chemical Analysis

A sample of the glacial till was also analyzed for the presence of pesticides and PCB's (EPA Method 8080). Results indicated levels below their respective method detection limits.

Hence, it is considered that pesticides and PCB's do not have a present impact or threat of impact on the glacial till soils at the site.

C. Heavy Metal Chemical Analysis

Levels of heavy metals (RCRA-8 Metals) in soil can be analyzed in two ways: first, by a simpler and less expensive "recoverable metals" test referred to as Total Metals, and second, by the Toxicity Characteristic Leaching Procedure (TCLP). The RCRA-8 Metals are arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver.

Recoverable levels approximate the total concentration in the soil and, as such, include metals that may be found in soil grains, in organic matter and as free metal.

The TCLP test measures the "leachability" of heavy metals from soil and, thus, is more indicative of the potential for release to the environment.

Soil is considered a hazardous material under Massachusetts law if its heavy metal concentration, as determined from the TCLP test, exceeds the maximum concentrations contained in the Federal Register Part II, Environmental Protection Agency (EPA) 40 CFR Part 261 et al. Further, Massachusetts law has no standard with regard to hazardous levels of "recoverable" metals in soil.

The results of recoverable metals analyses indicate very low levels of arsenic, barium, cadmium, chromium and lead in concentrations of 9.7 mg/kg, 31.1 mg/kg, 3.9 mg/kg, 19.4 mg/kg and 21.4 mg/kg, respectively.

These levels are typically near the low end of the reported range of concentrations found naturally in soils in the eastern United States. Results are presented on Table 1.

The maximum non-hazardous TCLP concentrations for arsenic, barium, cadmium, chromium and lead are 5.0 milligrams/liter (mg/L), 100.0 mg/L, 1.0 mg/L, 5.0 mg/L, and 5.0 mg/L, respectively.

Given that soil samples are diluted by a factor of 20 in performing TCLP Extraction , the corresponding maximum concentrations for the above metals could only be approximately 0.5 mg/L, 1.5 mg/L, 0.2 mg/L, 1.0 mg/L and 1.0 mg/L, respectively, and hence well within the allowable limits. Therefore, it is our opinion that none of the above metals are present in significantly soluble concentrations.

Hence, heavy metals are considered to not have a present impact or threat of impact on the soils at the project site.

D. Total Petroleum Hydrocarbons by Infra-Red Analysis

A sample of the natural glacial till was analyzed for the presence of total petroleum hydrocarbon (TPH) concentrations by Infra-Red (IR) analysis to provide a general indication of the presence of petroleum products in the natural glacial till soils at the site.

Results indicated a TPH concentration below the method detection limit of 40 parts per million (ppm); hence, the natural soils are not considered to be impacted by the presence of petroleum product.

The current Department of Environmental Protection action for regulating off-site disposal of excavated soil contaminated with total petroleum hydrocarbons is 100 ppm.

In conclusion, given that the levels of volatile organics, pesticides and PCB's, and total petroleum hydrocarbons were all below their respective method detection limits, and that the concentrations in which various heavy metals were detected are normal background levels, it is our opinion that excavated natural glacial till from the Deer Island site, as represented by the samples tested, may be disposed of off-site as unregulated soil in accordance with current DEP and EPA criteria.

In regard to the potential re-use of the glacial till, it is an excellent material for structural fill when placed and compacted under properly controlled conditions. Generally, it is a well-graded gravel, sand and silt (about 35 to 40 percent fines) which is readily compacted at its natural moisture content to 95 percent of its modified Proctor density (130 to 134 pcf); however, it should be used only during dry, non-freezing conditions. Further, compaction in lifts is facilitated by a very low percentage of boulders.

McPHAIL ASSOCIATES, INC.
Geotechnical Engineers

We trust that the above is sufficient for your present requirements. Should you have any questions concerning the above, please contact us.

Very truly yours,

McPHAIL ASSOCIATES, INC.

Ambrose J. Donovan

Ambrose J. Donovan

Robert E. McPhail

Robert E. McPhail, P.E.

Enclosure

2301

REM/ajd

DEER ISLAND PROJECT
J.M. CASHMAN, INC.
PROJECT NO. 2301

TOTAL METALS ANALYSIS
TABLE 1

	Sample of Natural On-Site Glacial Till	Range of Concentrations in Glacial Till[1] (mg/kg)
Arsenic	9.7	2.1 - 12
Barium	31.1	300 - 150
Cadmium	3.9	0.02 - 13.6
Chromium	19.4	30 - 150
Lead	21.4	10 - 30

Concentrations are recorded in milligrams per kilogram (mg/kg)

[1] From: A. Kabata-Pendies & H. Pendies CRC Press Inc. (1984) Trace Elements in Soils & Plants

ALPHA ANALYTICAL LABORATORIES
CERTIFICATE OF ANALYSIS

MA 086 NH 198958-A CT PH-0574

Laboratory Sample Number: 904646.1 Date Received: 08/31/90

Sample Matrix: Solid (results are reported on a dry weight basis) Date Reported: 09/05/90

Condition of Samples: Satisfactory Field Prep: None

Number & Type of Containers: Two glass jars and one VOA vial

Analysis Requested: Analysis as listed below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES EXT/PREP	DATES ANALYSIS
Total RCRA 8 Metals							
Arsenic	9.7	mg/Kg	1.0	1	7060	09/04/90	09/04/90
Barium	31.1	mg/Kg	9.7	1	6010	09/04/90	09/04/90
Cadmium	3.9	mg/Kg	1.9	1	6010	09/04/90	09/04/90
Chromium	19.4	mg/Kg	3.9	1	6010	09/04/90	09/04/90
Lead	21.4	mg/Kg	9.7	1	6010	09/04/90	09/04/90
Mercury	ND	mg/Kg	0.26	1	7470	09/04/90	09/04/90
Selenium	ND	mg/Kg	1.0	1	7740	09/04/90	09/04/90
Silver	ND	mg/Kg	1.9	1	6010	09/04/90	09/04/90
% Total Solids	96	%	0.1	3	2540B	----	09/01/90
Total Petroleum Hydrocarbons	ND	mg/Kg	40	2	503BCE	08/31/90	09/01/90
PCB's ***	ND	ug/Kg	250	1	8080	08/31/90	09/04/90
Pesticides ***	ND	ug/Kg	50	1	8080	08/31/90	09/04/90
Volatile Organics ***	ND	ug/Kg	**	1	8260	09/04/90	09/05/90

COMMENTS: * Complete list of References found in Addendum I
** Lists of PCB's, pesticides and volatile organics analyzed for and their detection limits accompany this report.
*** All compounds were below the detection limits except those listed above.

INDUSTRI-PLEX SITE

REMEDIAL TF

41 ATLANTIC A
WOBURN, MA

2200.205.034
AgencyCorres-USEPA-Out-1992

3 December 1992

Mr. Joseph N. DeCola
Remedial Project Manager/Waste Management Division
USEPA, Region 1
JFK Federal Building, HRS-CAN3
90 Canal Street
Boston, MA 02203-2211

Mr. Jay Naparstek
Remedial Project Manager
Massachusetts DEP
One Winter Street
Boston, MA 02108

RE: Fill from Deer Island

Dear Joe and Jay:

In reference to your letter of 25 November 1992 regarding fill from Deer Island, the Trust and Chemical Waste Management have concerns similar to your own regarding contaminated soil from this site. To address those concerns, RAWP Section 17.7.3 lists the volatiles and inorganics that will be tested for. Since the RAWP was submitted, the Trust has required additional testing for semi-volatiles. Attachment 1, a memorandum from the Trust to Chem. Waste, lists the soil tests that will be conducted for all soil sources. These tests will be conducted both at the borrow pit and at the stock pile on the Industri-Plex Site. This will be a proposed revision to the RAWP currently being reviewed. Attachment 2, the geotechnical specification for the fill, must also be met. Attachment 3 shows results of the first analysis.

The second point that you make in your letter is that Deer Island was not one of those sources investigated in PDI-Task S-3. This is true; however, the report refers to sources in the PDI-task S-3 as "potential borrow sources" for the various covers. Attachment 5 indicates that other considerations may dictate the use of other sources. No chemical analyses such as those proposed for the Deer Island soils were performed for the soils in PDI-Task S-3.

Since this report never received any comments from the Agencies approving or disapproving its contents or the sources investigated, the Trust has assumed that other sources are acceptable if they have soils that are acceptable geotechnically per the design requirements and are found to have organic and inorganic constituents below hazardous levels.

If the Agencies require additional tests to assure themselves that soils from Deer Island or any other "new locations" are acceptable, please indicate what tests are necessary. Also, if there are other concerns relating to the sources of soil for this project, please indicate what they are so that the Trust can respond.

TEL. 617-932-9599
FAX 617-932-9589

If approvals are specifically required for the use of the Deer Island soil or soils from othe ca tions, the Trust requests that approval be on the basis that soils pass the tests listed in Attach ments 1 and 2 and not on the basis of an "approved list of sources".

Sincerely,

David L. Baumgartner
Project Manager

dlb:jem
isrt:\deerisle

Attachment 1: Memorandum from D. L. Baumgartner (Trust) to M. F. Warminsky (CWM)
Attachment 2: Section 02223, Backfill and Fill Specifications from 100% Design Report
Attachment 3: Analytical Results on Deer Island Soil, dated 15 October 1992
Attachment 4: Background Concentration Levels
Attachment 5: Pages 18 and 32 from PDI-Task S-3

Copy to M. F. Warminsky, CWM
T. D. Kling, ISRT
D. M. Light, ISRT

ATTACHMENT 1

MEMORANDUM

TO: Mike Warminsky
FROM: Dave Baumgartner
RE: RAWP Section 17.7.3. Soil Testing, Review of proposed verification of clean soil sampling.

DATE: 10/15/92
JOB NUMBER: 903-6400

Upon review of the RAWP Section 17.7.3. there are several comments to the proposed Soil Testing Procedure:

The current series of tests included in the RAWP is as follows:

o Tests Proposed	USEPA Method	Alternate Method
Volatile Organic (TCL)	8240	-
Acid/Base Neutrals (TCL)	3550/8270	EPA 3540
Pesticides/PCB's (TCL)	3550/8080	EPA 3540
Metals (TCL)	3050/7000	EPA 6010
Cyanide	9010	
TPH (Total Petroleum) Hydrocarbon)	418.1 Modified soils	

The Trust wants the testing to be modified to include the following:

o Revised Tests	USEPA Method	Alternates
Volatile Organic (TCL)	8240	-
Acid/Base Neutrals (TCL)	3550/8270	EPA 3540
Pesticides/PCB's (TCL)	3550/8080	EPA 3540
Metals (TAL)	3050/6010 *	EPA 6010 Except Hg
Cyanide	9010	
TPH (Total Petroleum) Hydrocarbon)	418.1 Modified soils	

* TAL Metals by ICP and AA Methods. Test 6010. except run the following constituents by the following methods: (As) 7060 , (Pb) 7420 , (Se) 7740 , (Tl) 7840 , (Hg) 7470 . The 7000's are "furnace and cold vapor AA " methods.

The Trust wants the frequency of testing to be no less than 20,000 cubic yards for each source. Testing every 50,000 cubic yards is an insufficient frequency.

The Trust would like to review the cost of analytical testing. A cost of $1100 for semi-volatiles testing is extremely high and more reasonable costs are available from other laboratories.

VOC samples should be collected at a depth no less than 3 feet into a stockpile and in a manner to minimize loss of volatiles prior to analysis (ie. minimize mixing and head space in sample jars as much as possible)

69336

67300-03157
Page 1 of 10

CHAIN OF CUSTODY RECORD

Proj. No.	Project Name
67300	Industri/Plex

Samplers (Signature) Louis A Mazzuca

Sample #	Date	Time	Comp.	Grab	Sample Description	No. of Containers						Remarks
1014	10/14/92	7:45 Am	X		Brown Soil	(5) 8oz Jars						See Attached For Analyte List

Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Louis A Mazzuca	10/14/92 7:45 Am			
Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time	Received for Laboratory by:	Remarks	
	10/15/92 1000	Lynda Caulfield		

Bridgeport Environmental Inc.

Licensed Analytical Laboratories
08555

P.O. Box 247
510 Heron Drive Suite 107
Bridgeport, NJ 08014-0247

609/467-0380

CHEMICAL WASTE MANAGEMENT

PROJECT: INDUSTRI/PLEX

ANALYSIS NO:	CLIENT ID:
G 9335	1014-A
G 9336	1014

DATE RECEIVED: OCTOBER 15, 1992

BRIDGEPORT ENVIRONMENTAL, INC.

RICHARD W. LYNCH
LABORATORY MANAGER

67300-0315-2
Page 2 of 10

CERTIFICATE OF ANALYSIS

ANALYSIS NO: G 9336

CLIENT ID: 1014

PARAMETER	MDL (mg/kg)	RESULT (mg/kg)
Cyanide	0.10	N.D.
Total Petroleum Hydrocarbon	25.0	46.7

CERTIFICATE OF ANALYSIS

HAZARDOUS SUBSTANCE LIST

ANALYSIS NO: G 9336

CLIENT ID: 1014

METALS	MDL (mg/kg)	RESULT mg/kg)
ALUMINUM	10.0	11000
ANTIMONY	5.05	16.1
ARSENIC	0.25	6.29
BARIUM	5.00	34.6
BERYLLIUM	1.00	N.D.
CADMIUM	1.00	N.D.
CALCIUM	5.00	3350
CHROMIUM	1.00	20.4
COBALT	5.00	13.3
COPPER	1.00	16.8
IRON	5.00	23200
LEAD	5.00	4.95
MAGNESIUM	5.00	5180
MANGANESE	1.00	480
MERCURY	0.10	N.D.
NICKEL	5.00	17.6
POTTASSIUM	10.0	1360
SELENIUM	0.25	N.D.
SILVER	1.00	N.D.
SODIUM	5.00	445
THALLIUM	1.00	N.D.
VANADIUM	5.00	31.6
ZINC	1.00	53.1

67300-0315-2

Bridgeport Environmental
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NUMBER	G9336	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>87688	DATE ANALYZED	10/22/92

COMPOUND	UG/KG		MDL	COMPOUND	UG/KG	MDL
Acrolein	ND		54	Bromodichloromethane	ND	5
Acrylonitrile	ND		54	2-Chloroethylvinylether	ND	11
Chloromethane	ND		11	2-Hexanone	ND	11
Bromomethane	ND		11	trans-1,3-Dichloropropene	ND	5
Vinyl Chloride	ND		11	Toluene	ND	5
Chloroethane	ND		11	cis-1,3-Dichloropropene	ND	5
Acetone	ND	B	11	1,1,2,2-Tetrachloroethane	ND	5
1,1-Dichloroethene	ND		5	1,1,2-Trichloroethane	ND	5
Carbon Disulfide	ND		11	4-Methyl-2-pentanone	ND	11
Methylene Chloride	4.9	J	5	Tetrachloroethene	ND	5
1,2-Dichloroethene(trans)	ND		5	Dibromochloromethane	ND	5
1,1-Dichloroethane	ND		5	Chlorobenzene	ND	5
Vinyl Acetate	ND		5	Ethylbenzene	ND	5
2-Butanone	ND		11	m&p-Xylenes	ND	5
Chloroform	ND		5	o-Xylene	ND	5
1,1,1-Trichloroethane	ND		5	Styrene	ND	5
Carbon Tetrachloride	ND		5	Bromoform	ND	5
1,2-Dichloroethane	ND		5	m-Dichlorobenzene	ND	5
Benzene	ND		5	p-Dichlorobenzene	ND	5
Trichloroethene	ND		5	o-Dichlorobenzene	ND	5
1,2-Dichloropropane	ND		5			

SURROGATE COMPOUNDS	% RECOVERY	LIMITS	STATUS
1,2-Dichloroethane-d4	102	70 - 121	OK
Toluene-d8	99.6	81 - 117	OK
Bromofluorobenzene	95.7	74 - 121	OK

Percent Solid of 93.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Bridgeport Environmental
SEMIVOLATILE ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NUMBER	G9336	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>E4602	DATE ANALYZED	10/21/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
N-Nitrosodimethylamine	ND	350	Acenaphthene	ND	350
Phenol	ND	350	2,4-Dinitrophenol	ND	1800
bis(-2-Chloroethyl)Ether	ND	350	4-Nitrophenol	ND	1800
2-Chlorophenol	ND	350	Dibenzofuran	ND	350
1,3-Dichlorobenzene	ND	350	2,4-Dinitrotoluene	ND	350
1,4-Dichlorobenzene	ND	350	2,6-Dinitrotoluene	ND	350
Benzyl Alcohol	ND	350	Diethylphthalate	ND	350
1,2-Dichlorobenzene	ND	350	4-Chlorophenyl-phenlyether	ND	350
2-Methylphenol	ND	350	Fluorene	ND	350
bis(2-chloroisopropyl)Ether	ND	350	4-Nitroaniline	ND	1800
4-Methylphenol	ND	350	4,6-Dinitro-2-Methylphenol	ND	1800
N-Nitroso-Di-n-Propylamine	ND	350	N-Nitrosodiphenylamine	ND	350
Hexachloroethane	ND	350	4-Bromophenyl-phenylether	ND	350
Nitrobenzene	ND	350	Hexachlorobenzene	ND	350
Isophorone	ND	350	Pentachlorophenol	ND	1800
2-Nitrophenol	ND	350	Phenanthrene	ND	350
2,4-Dimethylphenol	ND	350	Anthracene	ND	350
Benzoic Acid	ND	1800	Di-n-Butylphthalate	ND	350
bis(-2-Chloroethoxy)Methane	ND	350	Fluoranthene	ND	350
2,4-Dichlorophenol	ND	350	Pyrene	ND	350
1,2,4-Trichlorobenzene	ND	350	Butylbenzylphthalate	ND	350
Naphthalene	ND	350	3,3'-Dichlorobenzidine	ND	710
4-Chloroaniline	ND	350	Benzo(a)Anthracene	ND	350
Hexachlorobutadiene	ND	350	bis(2-Ethylhexyl)Phthalate	ND	350
4-Chloro-3-Methylphenol	ND	350	Chrysene	ND	350
2-Methylnaphthalene	ND	350	Di-n-Octyl Phthalate	ND	350
Hexachlorocyclopentadiene	ND	350	Benzo(b)Fluoranthene	ND	350
2,4,6-Trichlorophenol	ND	350	Benzo(k)Fluoranthene	ND	350
2,4,5-Trichlorophenol	ND	1800	Benzo(a)Pyrene	ND	350
2-Chloronaphthalene	ND	350	Indeno(1,2,3-cd)Pyrene	ND	350
2-Nitroaniline	ND	1800	Dibenzo(a,h)Anthracene	ND	350
Dimethyl Phthalate	ND	350	Benzo(g,h,i)Perylene	ND	350
Acenaphthylene	ND	350	Benzidine	ND	710
3-Nitroaniline	ND	1800			

Percent Solid of 93.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

67300-0315-2
Page 6 of 10

Lab Name : Bridgeport Environmental, Inc.
Client ID: 1014

Lab Sample ID:
69536

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Pesticides/PCBs

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 10/19/92
Date Analyzed: 10/23/92 07:32
Conc/Dil Factor: 10.00gm/10gm
Percent Moisture: 7

GPC Cleanup __ Yes _✓_ No
Separatory Funnel Extraction __ Yes
Continuous Liquid-Liquid Extraction __ Yes

CAS Number		ug/L or (ug/Kg)	
319-84-6	Alpha-BHC	5.4	U
319-85-7	Beta-BHC	5.4	U
319-86-8	Delta-BHC	5.4	U
58-89-9	Gamma-BHC (Lindane)	5.4	U
76-44-8	Heptachlor	5.4	U
309-00-2	Aldrin	5.4	U
1024-57-3	Heptachlor Epoxide	5.4	U
959-98-8	Endosulfan I	5.4	U
60-57-1	Dieldrin	5.4	U
72-55-9	4,4'-DDE	5.4	U
72-20-8	Endrin	5.4	U
33213-65-9	Endosulfan II	11	U
72-54-8	4,4'-DDD	11	U
1031-07-8	Endosulfan Sulfate	11	U
50-29-3	4,4'-DDT	11	U
72-43-5	Methoxychlor	270	U
7421-93-4	Endrin Aldehyde	10	U
57-74-9	Chlordane	260	U
8001-35-2	Toxaphene	540	U
12674-11-2	Aroclor-1016	270	U
11104-28-2	Aroclor-1221	270	U
11141-16-5	Aroclor-1232	270	U
53469-21-9	Aroclor-1242	270	U
12672-29-6	Aroclor-1248	270	U
11097-69-1	Aroclor-1254	270	U
11096-82-5	Aroclor-1260	270	U

U Undetected J Estimated value below detection level
* Amount reported is a mixture of Aroclors 1254 & 1260

67300-0315-2
Page 7 of 10

ATTERBERG LIMITS

SOIL SAMPLE GLACIAL TILL

LOCATION DEER ISLAND
BORING NO. _____ DEPTH _____
SAMPLE NO. _____
SPECIFIC GRAVITY 2.70

PROJECT DEER ISLAND
FILE NO. 2301
TEST NO. _____
DATE 10-9-92
TESTED BY TMC
CHECKED BY AJD

PLASTIC LIMIT — BALANCE NO. _____

DETERMINATION NO.	1	2	3
CONTAINER NO.	11	17	27
WT. CONTAINER & WET SOIL IN g	17.62	20.73	22.90
WT. CONTAINER & DRY SOIL IN g	16.74	19.57	21.41
WT. WATER IN g	0.88	1.16	1.49
WT. CONTAINER IN g	11.47	11.27	11.23
WT. DRY SOIL IN g	5.27	8.30	10.18
WATER CONTENT IN %	16.6	13.9	14.6

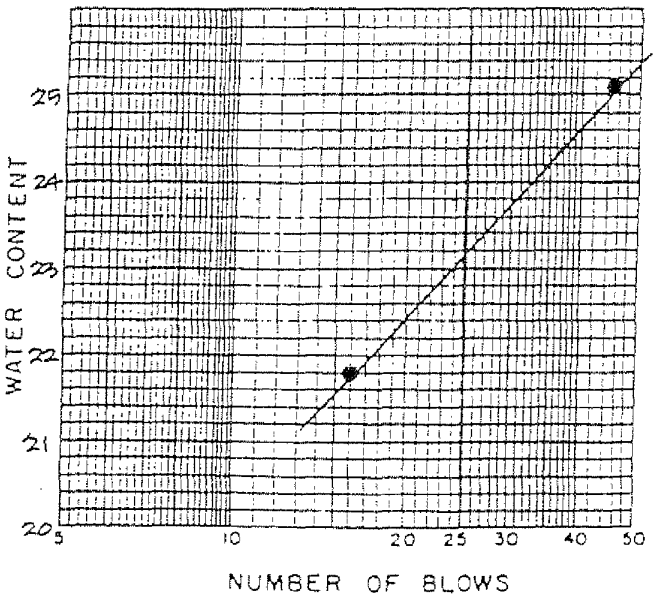
NATURAL WATER CONTENT

1	2	3
J-1	J-2	J-3
41.9	55.2	43.4
38.1	50.0	39.8
3.8	5.2	3.6
38.1	50.0	39.8
9.9	10.4	9.0

LIQUID LIMIT — BALANCE NO. _____

DETERMINATION NO.						
NO. OF BLOWS	16-16	45-45				
CONTAINER NO.	C	22				
WT. CONTAINER & WET SOIL IN g	31.67	39.18				
WT. CONTAINER & DRY SOIL IN g	28.04	34.36				
WT. WATER IN g	3.63	5.82				
WT. CONTAINER IN g	11.37	11.19				
WT. DRY SOIL IN g	16.67	23.17				
WATER CONTENT IN %	21.8	25.1				

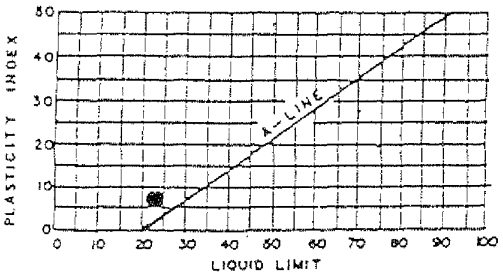
FLOW CURVE



RESULTS SUMMARY

NATURAL WATER CONTENT, w, 9.8
LIQUID LIMIT, w_L, 23.2
PLASTIC LIMIT, w_P, 15.0
PLASTICITY INDEX 8.2
FLOW INDEX _____
WATER-PLASTICITY RATIO $\frac{w-w_P}{w_L-w_P}$ _____

PLASTICITY CHART



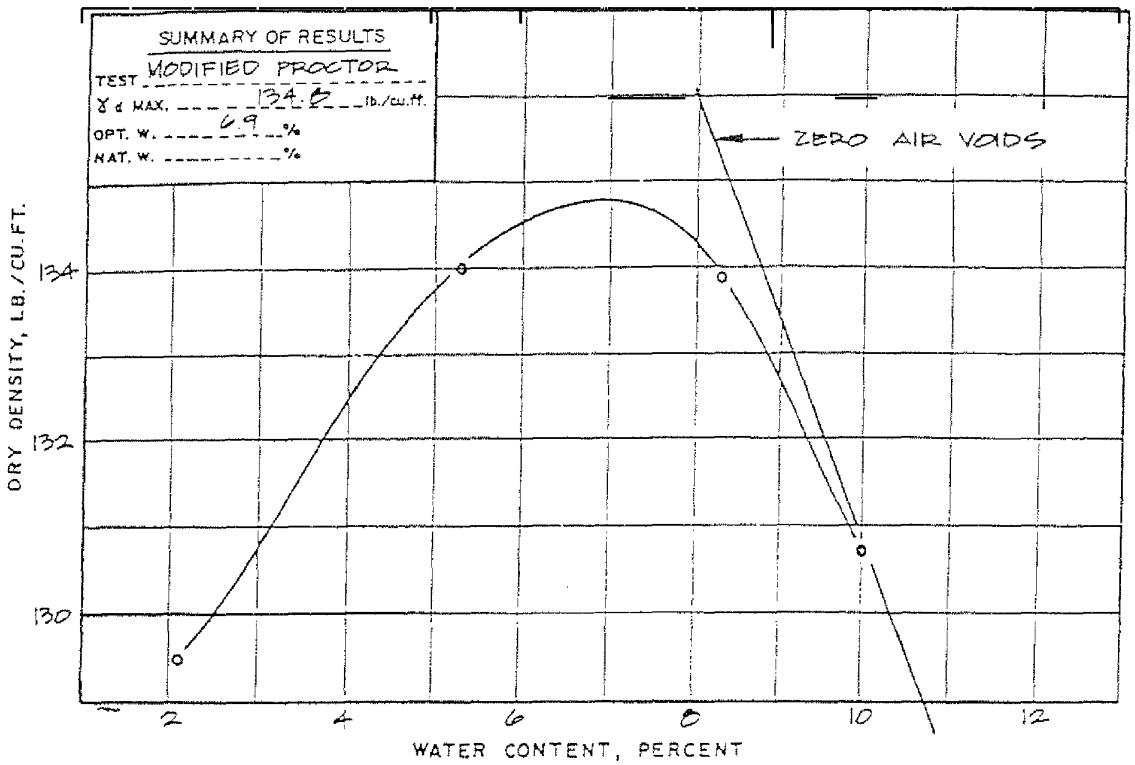
McPHAIL ASSOCIATES INC. 67300-0315-2

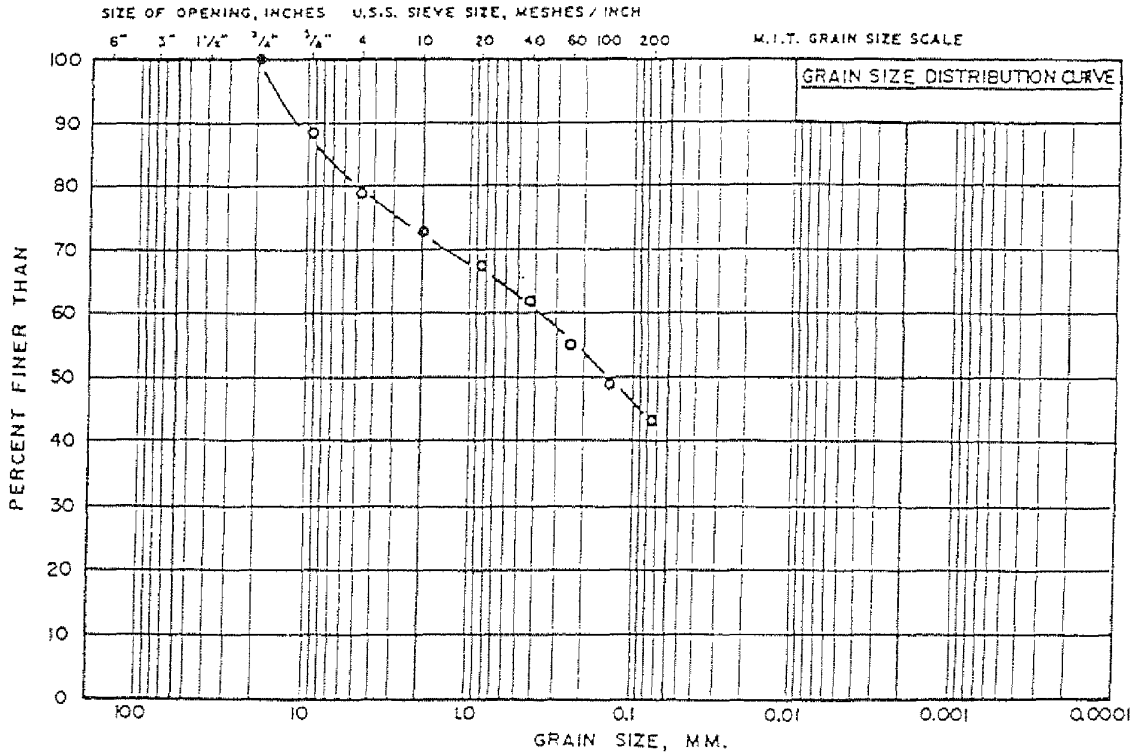
PROJECT No. 4201

LABORATORY COMPACTION TEST RESULTS

MATERIAL: GLACIAL TILL, SOURCE: J.M. CASHMAN INC. DEER ISLAND, DATE: 10-2-92

FIGURE





COBBLE SIZE	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE
	GRAVEL SIZE			SAND SIZE			FINE GRAINED	

McPHAIL ASSOCIATES INC.

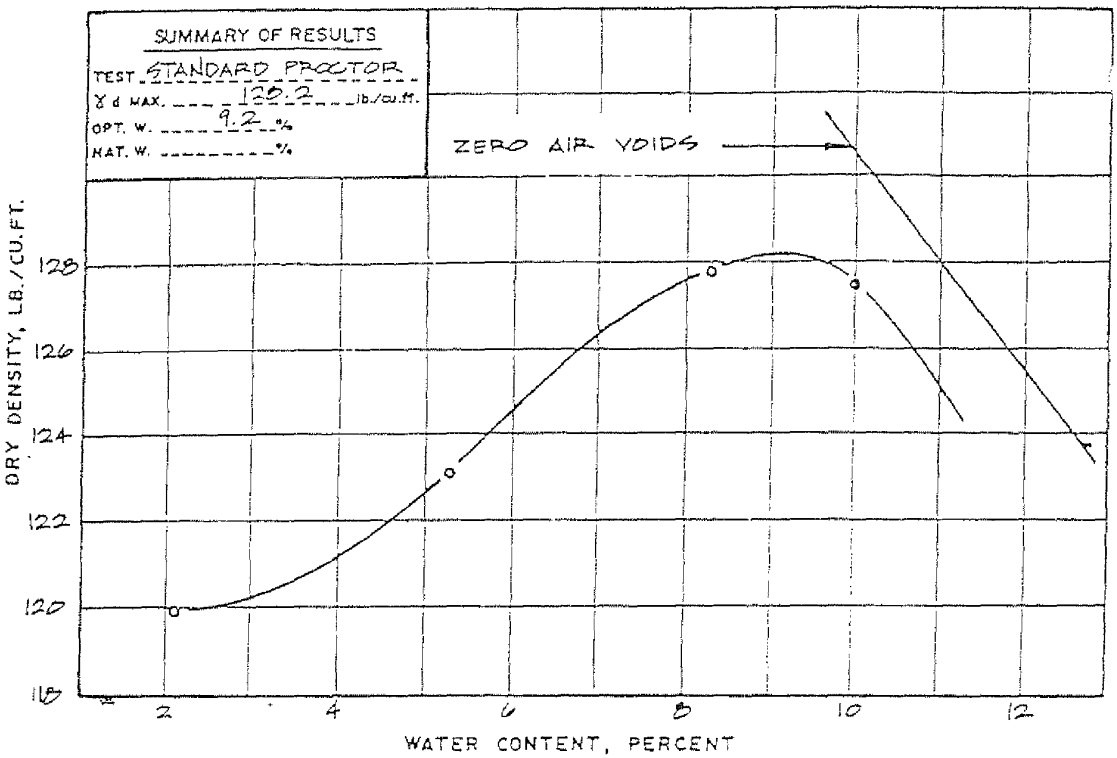
67300-0315-2
Page 9 of 10

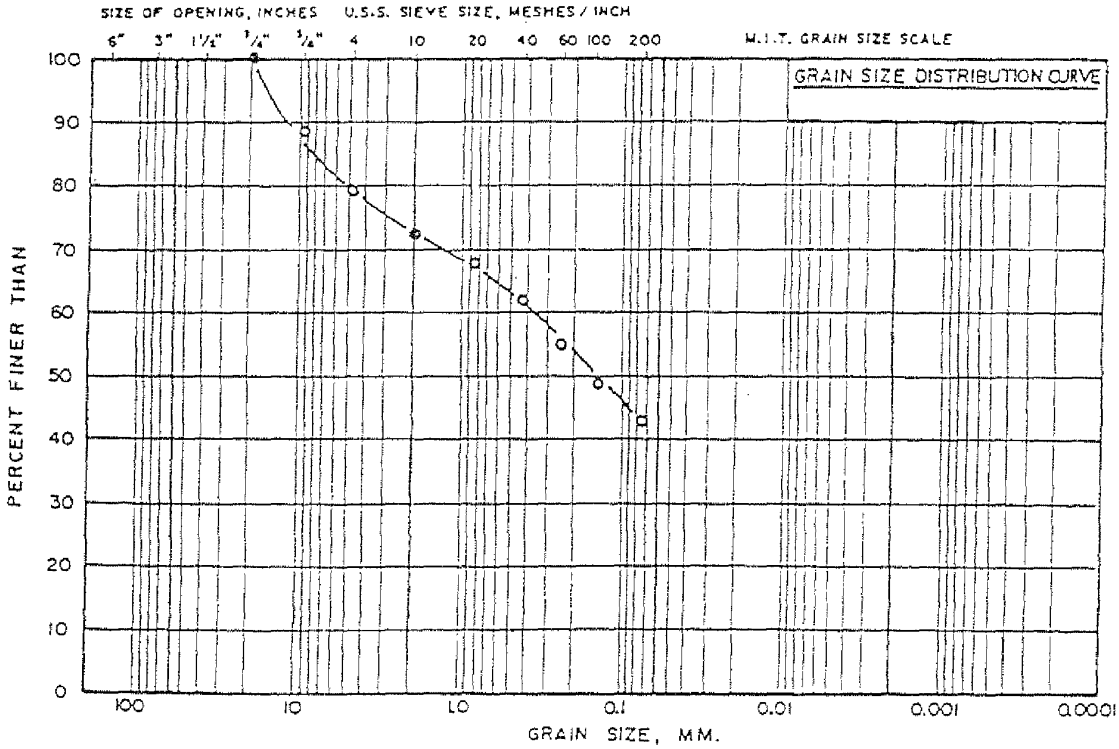
PROJECT No. 4291

LABORATORY COMPACTION TEST RESULTS

MATERIAL: GLACIAL TILL, SOURCE: J.M. CASHMAN, INC. DEER ISLAND, DATE: 10-2-92

FIGURE





COBBLE SIZE	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE
	GRAVEL SIZE			SAND SIZE			FINE GRAINED	

McPHAIL ASSOCIATES INC.

67300-0315-2
Page 10 of 10

TABLE 9

Summary of Background Concentrations

Analyte	Concentration	
1,1,1-trichloroethane	20	ug/kg
Acetone	6	ug/kg
Carbon disulfide	6	ug/kg
Trichloroethene	9	ug/kg
Bis(2-ethylhexyl)phthalate	1400	ug/kg
Benzoic acid	1700	ug/kg
Aluminum	7740	mg/kg
Antimony	36.8	mg/kg
Arsenic	25	mg/kg
Barium	38.9	mg/kg
Beryllium	0.50	mg/kg
Cadmium	3.6	mg/kg
Calcium	10,800	mg/kg
Chromium	23	mg/kg
Cobalt	4.1	mg/kg
Copper	14.2	mg/kg
Iron	11,100	mg/kg
Lead	87	mg/kg
Magnesium	2,680	mg/kg
Manganese	141	mg/kg
Mercury	0.4	mg/kg
Nickel	19.6	mg/kg
Potassium	1,660	mg/kg
Selenium	1.7	mg/kg
Silver	2.6	mg/kg
Sodium	1,470	mg/kg
Thallium	1.6	mg/kg
Vanadium	17.2	mg/kg
Zinc	32.5	mg/kg

NOTE: Arsenic, lead, and chromium background concentrations determined from SW-846 analyses (see text). Background concentration of all other analytes is largest concentration reported in three samples analyzed by Contract Lab Program - Routine Analytical Services.

C:S1TAB9

Kane Perkins: Samples of screened and unscreened topsoil were collected. The site is approximately 200 to 300 acres consisting of a concrete and processing plant. The topsoil is taken from farmland in the area which is being developed. Approximately 30,000 to 40,000 cubic yards of screened and unscreened topsoil is available.

Quinn Perkins: Two samples of 3/8-inch stone and one sample of 3/4-inch stone were collected. In addition, two samples of fill (concrete sand and prepared gravel) were taken. The site serves as a processing plant that receives material from six different sites. Each site is approximately 200 to 300 acres with a combined reserve on the order of 5 million cubic yards.

The Townsend site is located northwest of Woburn approximately 55 miles. The truck route would involve travelling 495 North to 93 South to 128 South. The Ashburnham, Hubbardston and Winchendon sites are located approximately 65 to 70 miles west of Woburn. The truck route from these sites would be via Route 2 East to 495 North to 93 South to 128 South. The Billerica site is located approximately 10 to 15 miles northwest of Woburn. The route from the site would involve travelling Route 3 South to Route 128 North. The Quinn Perkins site is located approximately 4 miles off Route 128 South of Woburn. The Kane Perkins site is located in Hudson about 30 miles west of Woburn. The truck route from Hudson would be via Route 30 East to Route 128 North.

It is understood that MDEP permitting addresses the environmental sensitivity of borrow pits; hence, these permitted borrow sources should not be environmentally sensitive areas. Additional sources may be determined by the selected contractor prior to actual cap construction. These additional sources would need to be investigated to assure that the design specifications are met. Materials specifications, sampling and testing protocols, and approval procedures shall be specified as part of the bid documents

The laboratory testing program conducted on the soil samples should be considered as preliminary and should be used as an initial evaluation of potential sites for borrow sources. The samples obtained from each site were taken from stockpiles or cut-faces. It is unlikely that these stockpiles and working faces will still exist at the time of construction. It is also likely that development and construction in the site area may produce the quantities and types of soils needed, and consideration should be given to other potential borrow sources. In any event, additional sampling and testing of the borrow materials to be used will be required prior to construction. Once a site is chosen, a sampling and testing program will be required at a specified frequency to verify soil properties as borrow excavation progresses (see Section 7.0).

6.2 Geosynthetics

Three samples of geotextile and geomembrane were tested for the properties specified in the PDI Work Plan. The results of the geotextile testing were compared to the requirements and functions set forth in the Alternate Cover Design Report. All three geotextiles, Amoco, Trevira, and Polyfelt meet these requirements. The results of the geomembrane tests were compared with the NSF 54 standards. All three geomembranes, from Gundle, National Seal, and Schlegel meet the minimum standards.

The choice of geosynthetics appears to be one of experience and cost. The test results should be regarded as preliminary. Conformance testing will be needed at a specified frequency for the actual materials used in the field. Material specifications, sampling and testing frequencies, and approval procedures shall be specified as part of the bid documents that will be prepared in accordance with the Remedial Design Work Plan (see Section 7.0).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

November 23, 1992

2200.105.007
Fill from Deer Island as cover for IP site

Mr D. M. Light
Coordinator, IP Trust
41 Atlantic Avenue
Woburn, MA 01801

RE: Fill from Deer Island

Dear Mr Light:

We understand that the Trust is planning to use fill from the Boston Harbor Deer Island project as cover material at the Industri-Plex Site. We are concerned that this fill or portions of it may not be free from contamination. As you may realize, there has been significant soils contamination at Deer Island from leaking underground tanks.

As you may recall, Pre-Design Task S-3 is the document that identifies the potential sources of cap fill materials with associated testing on chemical and geotechnical characteristics as well as location. Several potential sources were identified; however, Deer Island was not among the potential sources. If the Trust is considering sources of fill other than those identified in PDI-Task S-3, then soils testing to determine geotechnical and chemical characteristics must be accomplished. Additionally, any new locations for fill must be approved by the Agencies before that fill can be used on the Industri-Plex Site.

The Agencies, of course, wish to assure that any material brought onto the IP Site is clean and free from metals wastes as well as organic contamination. Please inform the Agencies as to the methods you plan to utilize to assure that contaminated soils from Deer Island and any other "new locations" are not used as fill at the IP Site.

Sincerely,

Joseph N. DeCola
Remedial Project Manager

Jay Naparstek
DEP Remedial Project Manager

cc: P. Fitzsimmons, EPA
D. Winograd, EPA
G. Latowsky, FACE

ip.dif

PRINTED ON RECYCLED PAPER

CHEMICAL WASTE MANAGEMENT, INC.
100 Nassau Park Boulevard
PRINCETON, NEW JERSEY 08540
Telephone: (609) 243-7800

LETTER OF TRANSMITTAL

DATE October 27, 1992 JOB NO 67300
ATTENTION: T. Dale Kling
RE: ISRT Submittals

TO Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

GENTLEMEN:

WE ARE SENDING YOU: ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change Order ☐ _____

COPIES	DATE	No.	DESCRIPTION
4	10/27/92		Cover Soil -- Deer Island
			Specification Section 02242
			(Document #67300 - 031S - 2)

ISRT SUBMITTAL REVIEW
☐ No Exceptions Taken
☒ Make Corrections Noted
☐ Amend - Resubmit
☐ Rejected - Resubmit
Review Completion Date 10/30
RCN

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____, 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Please approve and return two copies.
The sample was a composite taken from the middle of the stockpile. The material is the same as the compacted fill, except that it has passed through a screen. The chemical analysis is, therefore, identical to the compacted fill's analysis.

SIGNED William Spalding

If enclosures are not as noted, kindly notify us at once.

MEMORANDUM

TO: Trustee Representative DATE: 10/29/92
FROM: Peter Neumann JOB NUMBER: 903-6400
RE: Review of CWM submittals (Doc. Contrl No., 67300-031S-1 & 2), "Compacted Fill and Material for the Wetland Berm -- Deer Island." "Cover Soil -- Deer Island Specification Section 02242".

Materials Reviewed:

1. Submittal consisted of two packages of 10 pages of 8-1/2 x 11-inch paper each and included the following:

- o Chain of Custody Record for the sampled soil, sampled 10/14. 1 pg.
- o Analytical Report of the proposed soil from Bridgeport Environmental Inc. . Including TPH, Cynide, Metals, VOC's,Semi-volatiles,Pesticide Organics Analysis Data Sheet, 6 pgs.
- o Physical Tests including, Atterberg Limits, Standard and Modified Proctor Tests and gradation. 3 pgs.

2. Received submittal on 10/27/92.

Review Comments:

o Analytical Test Results

Results are satisfactory. Future test results should also include the following:

The soil sample description should identify whether the sample was taken from a screened or unscreened stockpile. The sample should be taken from an unscreened stockpile if unscreened material will be used on site.

The test method for each analytical test should be identified and the laboratory manager should sign the report.

o Physical Test Results

The proposed Cover Soils as indicated by the submitted tests are satisfactory for Cover Soils for areas where grading in areas with slopes flatter than 8 horizontal to 1 vertical.

The proposed Compacted fill material for the Created Wetland Berm as indicated by the submitted tests are satisfactory based on the gradation tests and Proctor tests submitted.

Conformance Soil samples sent out for physical testing are pending.

Disposition of Submittal:
Make Corrections Noted in accordance with Section 01300 of the 100% Design Documents.

G9836

67300-03157
Page 1 of 10

CHAIN OF CUSTODY RECORD

Proj. No.	Project Name
67300	Industri/Plex

Samplers (Signature) Louis A Mannina

Sample #	Date	Time	Comp.	Grab	Sample Description	No. of Containers	Remarks
1014	10/14/92	2:45 AM	X		Brown Soil	(5) 8oz JARS	See Attached For Analyte List

Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Louis A Mannina	10/14/92 2:45 AM			
Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time	Received for Laboratory by:	Remarks	
	10/15/92 1000	Lynda Caulk		

Bridgeport Environmental Inc.

Licensed Analytical Laboratories
08555

P O Box 247
510 Heron Drive Suite 107
Bridgeport, NJ 08014-0247

609/467-0380

CHEMICAL WASTE MANAGEMENT

PROJECT: INDUSTRI/PLEX

ANALYSIS NO:	CLIENT ID:
G 9335	1014-A
G 9336	1014

DATE RECEIVED: OCTOBER 15, 1992

BRIDGEPORT ENVIRONMENTAL, INC.

RICHARD W. LYNCH
LABORATORY MANAGER

67300-0315-2
Page 2 of 10

CERTIFICATE OF ANALYSIS

ANALYSIS NO: G 9336

CLIENT ID: 1014

PARAMETER	MDL (mg/kg)	RESULT (mg/kg)
Cyanide	0.10	N.D.
Total Petroleum Hydrocarbon	25.0	46.7

CERTIFICATE OF ANALYSIS

HAZARDOUS SUBSTANCE LIST

ANALYSIS NO: G 9336

CLIENT ID: 1014

METALS	MDL (mg/kg)	RESULT mg/kg)
ALUMINUM	10.0	11000
ANTIMONY	5.05	16.1
ARSENIC	0.25	6.29
BARIUM	5.00	34.6
BERYLLIUM	1.00	N.D.
CADMIUM	1.00	N.D.
CALCIUM	5.00	3350
CHROMIUM	1.00	20.4
COBALT	5.00	13.3
COPPER	1.00	16.8
IRON	5.00	23200
LEAD	5.00	4.95
MAGNESIUM	5.00	5180
MANGANESE	1.00	480
MERCURY	0.10	N.D.
NICKEL	5.00	17.6
POTIASSIUM	10.0	1360
SELENIUM	0.25	N.D.
SILVER	1.00	N.D.
SODIUM	5.00	445
THALLIUM	1.00	N.D.
VANADIUM	5.00	31.6
ZINC	1.00	53.1

Bridgeport Environmental
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NUMBER	G9336	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>A7680	DATE ANALYZED	10/22/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Acrolein	ND	54	Bromodichloromethane	ND	5
Acrylonitrile	ND	54	2-Chloroethylvinylether	ND	11
Chloromethane	ND	11	2-Hexanone	ND	11
Bromomethane	ND	11	trans-1,3-Dichloropropene	ND	5
Vinyl Chloride	ND	11	Toluene	ND	5
Chloroethane	ND	11	cis-1,3-Dichloropropene	ND	5
Acetone	ND B	11	1,1,2,2-Tetrachloroethane	ND	5
1,1-Dichloroethene	ND	5	1,1,2-Trichloroethane	ND	5
Carbon Disulfide	ND	11	4-Methyl-2-pentanone	ND	11
Methylene Chloride	4.8 J	5	Tetrachloroethene	ND	5
1,2-Dichloroethene(trans)	ND	5	Dibromochloromethane	ND	5
1,1-Dichloroethane	ND	5	Chlorobenzene	ND	5
Vinyl Acetate	ND	5	Ethylbenzene	ND	5
2-Butanone	ND	11	m&p-Xylenes	ND	5
Chloroform	ND	5	o-Xylene	ND	5
1,1,1-Trichloroethane	ND	5	Styrene	ND	5
Carbon Tetrachloride	ND	5	Bromoform	ND	5
1,2-Dichloroethane	ND	5	m-Dichlorobenzene	ND	5
Benzene	ND	5	p-Dichlorobenzene	ND	5
Trichloroethene	ND	5	o-Dichlorobenzene	ND	5
1,2-Dichloropropane	ND	5			

SURROGATE COMPOUNDS	% RECOVERY	LIMITS	STATUS
1,2-Dichloroethane-d4	102	70 - 121	OK
Toluene-d8	99.6	81 - 117	OK
Bromofluorobenzene	95.7	74 - 121	OK

Percent Solid of 93.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Bridgeport Environmental
SEMIVOLATILE ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NUMBER	G9336	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>E4602	DATE ANALYZED	10/21/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
N-Nitrosodimethylamine	ND	350	Acenaphthene	ND	350
Phenol	ND	350	2,4-Dinitrophenol	ND	1800
bis(-2-Chloroethyl)Ether	ND	350	4-Nitrophenol	ND	1800
2-Chlorophenol	ND	350	Dibenzofuran	ND	350
1,3-Dichlorobenzene	ND	350	2,4-Dinitrotoluene	ND	350
1,4-Dichlorobenzene	ND	350	2,6-Dinitrotoluene	ND	350
Benzyl Alcohol	ND	350	Diethylphthalate	ND	350
1,2-Dichlorobenzene	ND	350	4-Chlorophenyl-phenlyether	ND	350
2-Methylphenol	ND	350	Fluorene	ND	350
bis(2-chloroisopropyl)Ether	ND	350	4-Nitroaniline	ND	1800
4-Methylphenol	ND	350	4,6-Dinitro-2-Methylphenol	ND	1800
N-Nitroso-Di-n-Propylamine	ND	350	N-Nitrosodiphenylamine	ND	350
Hexachloroethane	ND	350	4-Bromophenyl-phenylether	ND	350
Nitrobenzene	ND	350	Hexachlorobenzene	ND	350
Isophorone	ND	350	Pentachlorophenol	ND	1800
2-Nitrophenol	ND	350	Phenanthrene	ND	350
2,4-Dimethylphenol	ND	350	Anthracene	ND	350
Benzoic Acid	ND	1800	Di-n-Butylphthalate	ND	350
bis(-2-Chloroethoxy)Methane	ND	350	Fluoranthene	ND	350
2,4-Dichlorophenol	ND	350	Pyrene	ND	350
1,2,4-Trichlorobenzene	ND	350	Butylbenzylphthalate	ND	350
Naphthalene	ND	350	3,3'-Dichlorobenzidine	ND	710
4-Chloroaniline	ND	350	Benzo(a)Anthracene	ND	350
Hexachlorobutadiene	ND	350	bis(2-Ethylhexyl)Phthalate	ND	350
4-Chloro-3-Methylphenol	ND	350	Chrysene	ND	350
2-Methylnaphthalene	ND	350	Di-n-Octyl Phthalate	ND	350
Hexachlorocyclopentadiene	ND	350	Benzo(b)Fluoranthene	ND	350
2,4,6-Trichlorophenol	ND	350	Benzo(k)Fluoranthene	ND	350
2,4,5-Trichlorophenol	ND	1800	Benzo(a)Pyrene	ND	350
2-Chloronaphthalene	ND	350	Indeno(1,2,3-cd)Pyrene	ND	350
2-Nitroaniline	ND	1800	Dibenzo(a,h)Anthracene	ND	350
Dimethyl Phthalate	ND	350	Benzo(g,h,i)Perylene	ND	350
Acenaphthylene	ND	350	Benzidine	ND	710
3-Nitroaniline	ND	1800			

Percent Solid of 93.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

67300-031S-2
Page 6 of 10

Lab Name : Bridgeport Environmental, Inc.
Client ID: 1019

Lab Sample ID:
69336

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Pesticides/PCBs

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 10/19/92
Date Analyzed: 10/22/92 07:32
Conc/Dil Factor: 10.0gm/10ml
Percent Moisture: 7

GPC Cleanup __ Yes _✓_ No
Separatory Funnel Extraction __ Yes
Continuous Liquid-Liquid Extraction __ Yes

C.A.S. Number		ug/L or (ug/Kg)	
319-84-6	Alpha-BHC	5.4	U
319-87-7	Beta-BHC	5.4	U
319-86-8	Delta-BHC	5.4	U
58-89-9	Gamma-BHC (Lindane)	5.4	U
76-44-8	Heptachlor	5.4	U
309-00-2	Aldrin	5.4	U
1024-57-3	Heptachlor Epoxide	5.4	U
959-98-8	Endosulfan I	5.4	U
60-57-1	Dieldrin	5.4	U
72-55-9	4,4'-DDE	5.4	U
72-20-8	Endrin	5.4	U
33213-65-9	Endosulfan II	11	U
72-54-8	4,4'-DDD	11	U
1031-07-8	Endosulfan Sulfate	11	U
50-29-3	4,4'-DDT	11	U
72-43-5	Methoxychlor	270	U
7421-93-4	Endrin Aldehyde	10	U
57-74-9	Chlordane	280	U
8001-35-2	Toxaphene	540	U
12674-11-2	Aroclor 1016	270	U
11104-28-2	Aroclor-1221	270	U
11141-16-5	Aroclor-1232	270	U
53469-21-9	Aroclor-1242	270	U
12672-29-6	Aroclor-1248	270	U
11097-69-1	Aroclor-1254	270	U
11096-82-5	Aroclor-1260	270	U

U Undetected J Estimated value below detection level
* Amount reported is a mixture of Aroclors 1254 & 1260

Form 1 7/85

67300-0315-2
Page 7 of 10

ATTERBERG LIMITS

SOIL SAMPLE GLACIAL TILL

LOCATION DEER ISLAND

BORING NO. _____ DEPTH _____

SAMPLE NO. _____

SPECIFIC GRAVITY 2.70

PROJECT DEER ISLAND

FILE NO. 2301

TEST NO. _____

DATE 10-9-92

TESTED BY TMC

CHECKED BY AJD

PLASTIC LIMIT — BALANCE NO. _____

DETERMINATION NO.	1	2	3
CONTAINER NO.	11	17	27
WT. CONTAINER & WET SOIL IN g	17.62	20.73	22.90
WT. CONTAINER & DRY SOIL IN g	16.74	19.57	21.41
WT. WATER IN g	0.88	1.16	1.49
WT. CONTAINER IN g	11.47	11.27	11.23
WT. DRY SOIL IN g	5.27	8.30	10.18
WATER CONTENT IN %	16.6	13.9	14.6

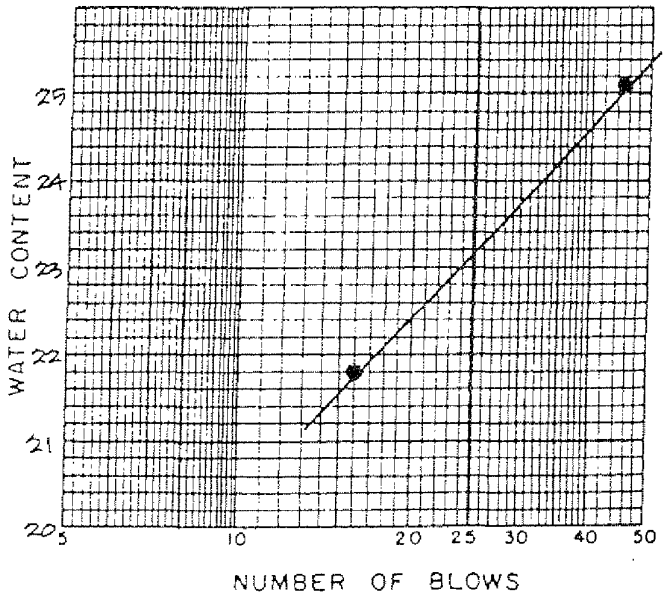
NATURAL WATER CONTENT

1	2	3
J-1	J-2	J-3
41.9	59.2	43.4
38.1	50.0	39.8
3.8	5.2	3.6
38.1	50.0	39.8
9.9	10.4	9.0

LIQUID LIMIT — BALANCE NO. _____

DETERMINATION NO.						
NO. OF BLOWS	16-16	45-45				
CONTAINER NO.	C	22				
WT. CONTAINER & WET SOIL IN g	31.67	39.18				
WT. CONTAINER & DRY SOIL IN g	28.04	34.36				
WT. WATER IN g	3.63	5.82				
WT. CONTAINER IN g	11.37	11.19				
WT. DRY SOIL IN g	16.67	23.17				
WATER CONTENT IN %	21.8	25.1				

FLOW CURVE



RESULTS SUMMARY

NATURAL WATER CONTENT, w, 9.8

LIQUID LIMIT, w_L, 23.2

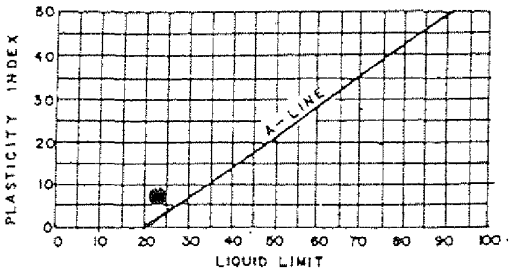
PLASTIC LIMIT, w_P, 15.0

PLASTICITY INDEX 8.2

FLOW INDEX _____

WATER – PLASTICITY RATIO $\frac{w - w_P}{w_L - w_P}$

PLASTICITY CHART



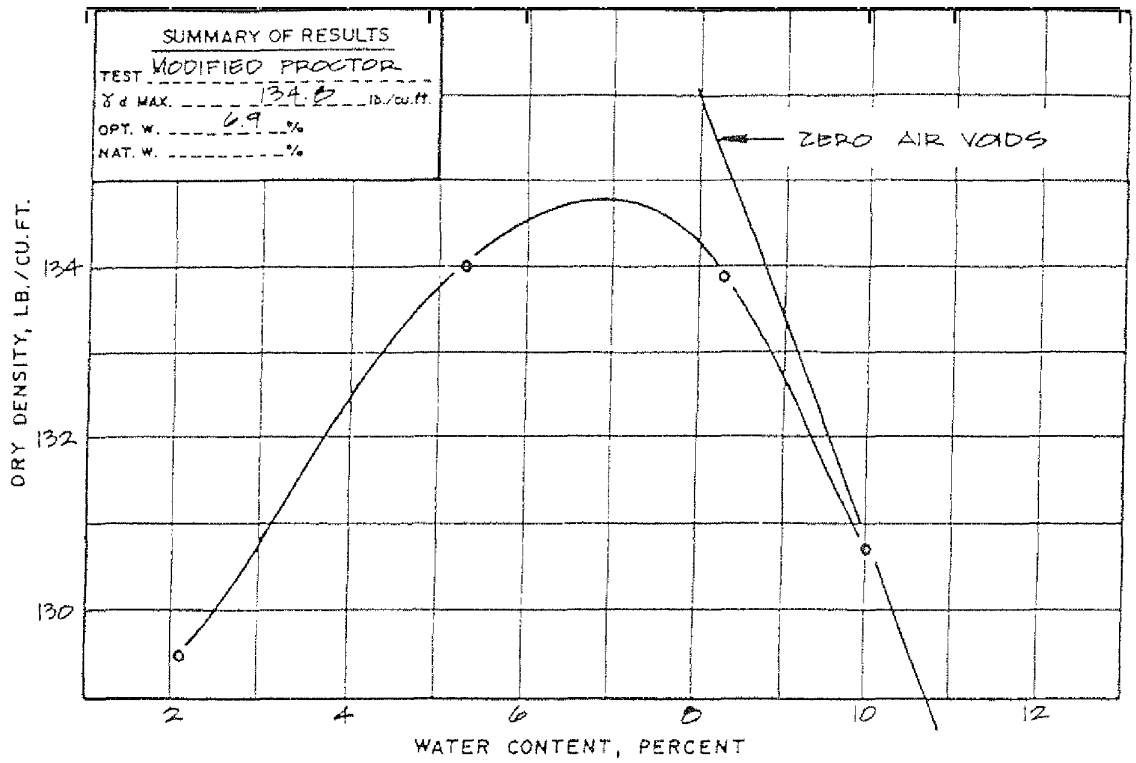
McPHAIL ASSOCIATES INC. 67300-0315-2

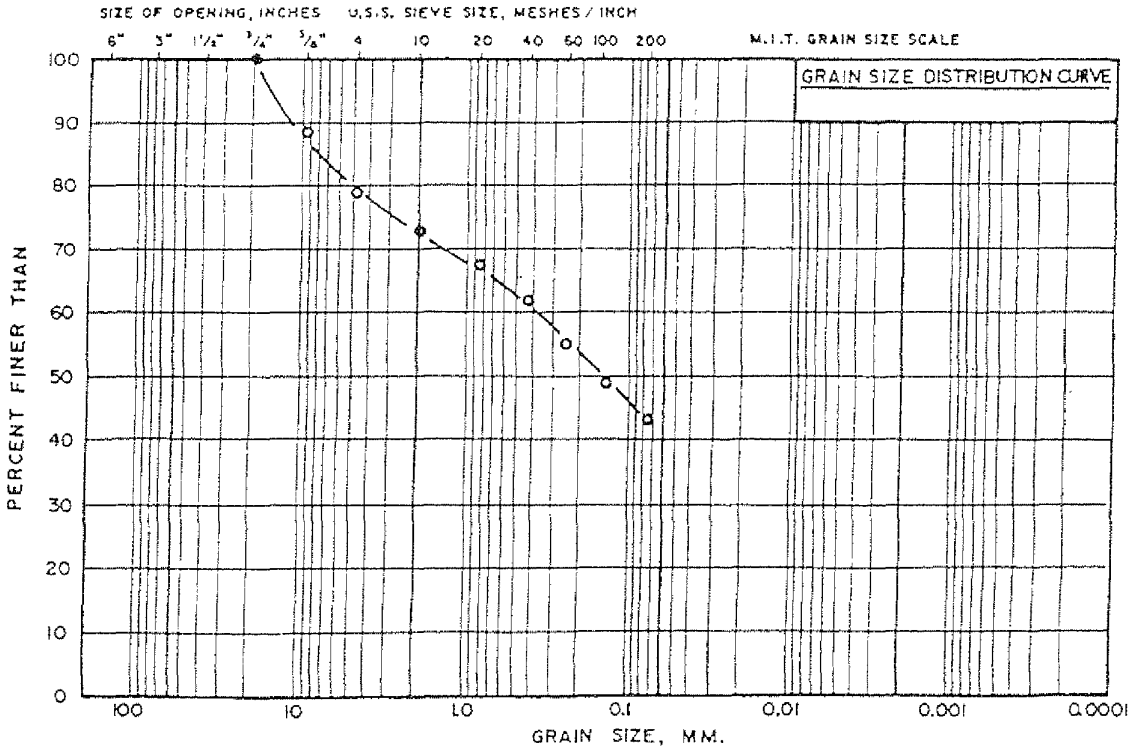
PROJECT No. 1201

LABORATORY COMPACTION TEST RESULTS

MATERIAL: GLACIAL TILL, SOURCE: J.M. CASHMAN INC. DEER ISLAND, DATE: 10-2-92

FIGURE





COBBLE SIZE	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE
	GRAVEL SIZE			SAND SIZE			FINE GRAINED	

McPHAIL ASSOCIATES INC.

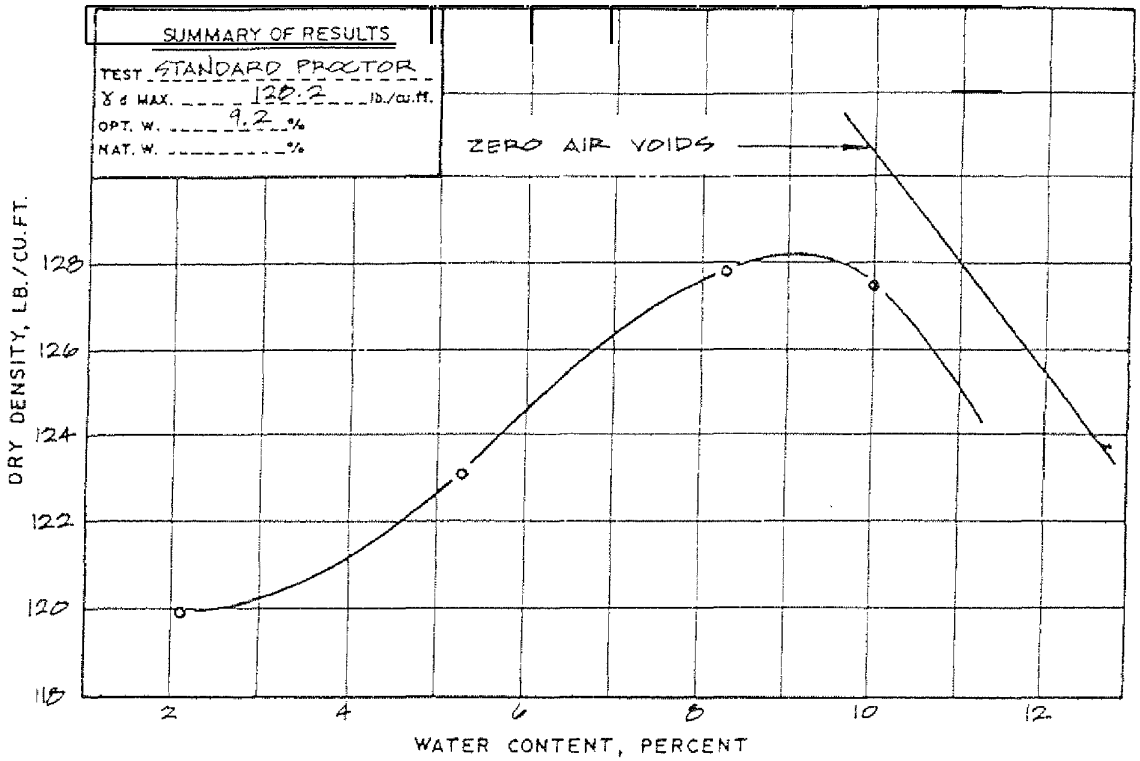
67300-0315-2
Page 9 of 10

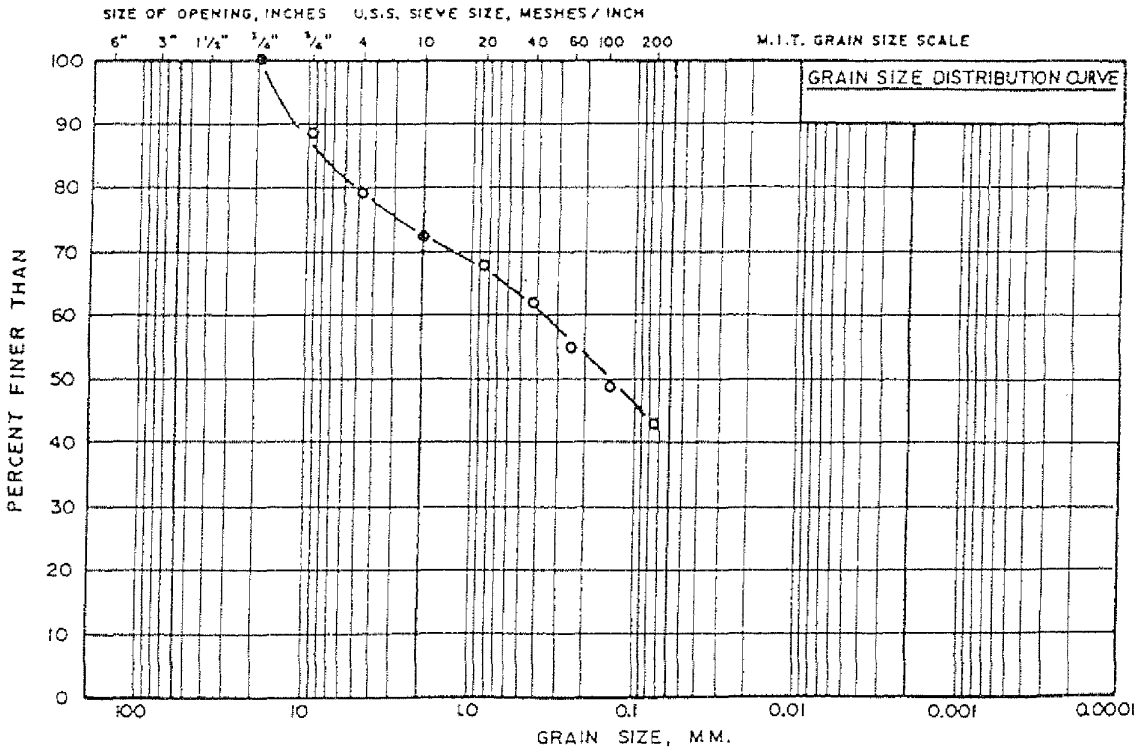
PROJECT NO. 67300

LABORATORY COMPACTION TEST RESULTS

MATERIAL: GLACIAL TILL, SOURCE: J.M. CASHMAN, INC. DEER ISLAND, DATE: 10-2-92

FIGURE





COBBLE SIZE	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE
	GRAVEL SIZE			SAND SIZE			FINE GRAINED	

McPHAIL ASSOCIATES INC.

67300-0315-2
Page 10 of 10

CHEMICAL WASTE MANAGEMENT, INC.
100 Nassau Park Boulevard
PRINCETON, NEW JERSEY 08540
Telephone: (609) 243-7800

LETTER OF TRANSMITTAL

DATE October 27, 1992 JOB NO. 67300
ATTENTION: T. Dale Kling
RE: ISRT Submittals

TO Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

GENTLEMEN:

WE ARE SENDING YOU: ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change Order ☐ _____

COPIES	DATE	No.	DESCRIPTION
4	10/27/92		Compacted Fill and Material for the Wetland Berm -- Deer Island
			(Document # 67300 - 031S - 1)
			[illegible] SUBMITTAL REVIEW
			X [illegible] Revisions Noted
			[illegible]

[illegible] Completion Date 10/30/92
PCN

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____, 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS	Please approve and return two copies.
	The soil samples were composites from the middle of the stockpile.

COPY TO File, John Hoff SIGNED William Spessing

If enclosures are not as noted, kindly notify us at once.

a: trnsmtl

MEMORANDUM

TO: Trustee Representative DATE: 10/29/92
FROM: Peter Neumann JOB NUMBER: 903-6400
RE: Review of CWM submittals (Doc. Contrl No., 67300-031S-1 & 2), "Compacted Fill and Material for the Wetland Berm -- Deer Island." "Cover Soil -- Deer Island Specification Section 02242".

Materials Reviewed:

1. Submittal consisted of two packages of 10 pages of 8-1/2 x 11-inch paper each and included the following:

- o Chain of Custody Record for the sampled soil, sampled 10/14. 1 pg.
- o Analytical Report of the proposed soil from Bridgeport Environmental Inc. . Including TPH, Cynide, Metals, VOC's,Semi-volatiles,Pesticide Organics Analysis Data Sheet, 6 pgs.
- o Physical Tests including, Atterberg Limits, Standard and Modified Proctor Tests and gradation. 3 pgs.

2. Received submittal on 10/27/92.

Review Comments:

o Analytical Test Results

Results are satisfactory. Future test results should also include the following:

The soil sample description should identify whether the sample was taken from a screened or unscreened stockpile. The sample should be taken from an unscreened stockpile if unscreened material will be used on site.

The test method for each analytical test should be identified and the laboratory manager should sign the report.

o Physical Test Results

The proposed Cover Soils as indicated by the submitted tests are satisfactory for Cover Soils for areas where grading in areas with slopes flatter than 8 horizontal to 1 vertical.

The proposed Compacted fill material for the Created Wetland Berm as indicated by the submitted tests are satisfactory based on the gradation tests and Proctor tests submitted.

Conformance Soil samples sent out for physical testing are pending.

Disposition of Submittal:
Make Corrections Noted in accordance with Section 01300 of the 100% Design Documents.

69836

67300-0315-1
Page 1 of 10

CHAIN OF CUSTODY RECORD

Proj. No.	Project Name
67300	Industri/Plex

Samplers (Signature) Louis A. Mannina

Sample #	Date	Time	Comp.	Grab	Sample Description	No. of Containers	Remarks
1014	10/14/92	7:45 Am	X		Brown Soil	(5) 8oz. Jars	See Attached For Analyte List

Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Louis A. Mannina	10/14/92 7:45 Am			
Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time	Received for Laboratory by:	Remarks	
	10/15/92 1000	Lynda Carlin		

Bridgeport Environmental Inc.

Licensed Analytical Laboratories
08555

P O Box 247
510 Heron Drive Suite 107
Bridgeport, NJ 08014-0247

609/467-0380

CHEMICAL WASTE MANAGEMENT

PROJECT: INDUSTRI/PLEX

ANALYSIS NO:	CLIENT ID:
G 9335	1014-A
G 9336	1014

DATE RECEIVED: OCTOBER 15, 1992

BRIDGEPORT ENVIRONMENTAL, INC.

RICHARD W. LYNCH
LABORATORY MANAGER

67300-0315-1
Page 2 of 10

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67300 - 0315 - 1

Bridgeport Environmental
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DATA FILE	)A2680	DATE ANALYZED	10/22/92

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Bromomethane	ND	11	trans-1,3-Dichloropropene	ND	5
Vinyl Chloride	ND	11	Toluene	ND	5
Chloroethane	ND	11	cis-1,3-Dichloropropene	ND	5
Acetone	ND B	11	1,1,2,2-Tetrachloroethane	ND	5
1,1-Dichloroethene	ND	5	1,1,2-Trichloroethane	ND	5
Carbon Disulfide	ND	11	4-Methyl-2-pentanone	ND	11
Methylene Chloride	4.8 J	5	Tetrachloroethene	ND	5
1,2-Dichloroethene(trans)	ND	5	Dibromochloromethane	ND	5
1,1-Dichloroethane	ND	5	Chlorobenzene	ND	5
Vinyl Acetate	ND	5	Ethylbenzene	ND	5
2-Butanone	ND	11	m&p-Xylenes	ND	5
Chloroform	ND	5	o-Xylene	ND	5
1,1,1-Trichloroethane	ND	5	Styrene	ND	5
Carbon Tetrachloride	ND	5	Bromoform	ND	5
1,2-Dichloroethane	ND	5	m-Dichlorobenzene	ND	5
Benzene	ND	5	p-Dichlorobenzene	ND	5
Trichloroethene	ND	5	o-Dichlorobenzene	ND	5
1,2-Dichloropropane	ND	5			

SURROGATE COMPOUNDS	% RECOVERY	LIMITS	STATUS
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bis(-2-Chloroethyl)Ether	ND	350	4-Nitrophenol	ND	1800
2-Chlorophenol	ND	350	Dibenzofuran	ND	350
1,3-Dichlorobenzene	ND	350	2,4-Dinitrotoluene	ND	350
1,4-Dichlorobenzene	ND	350	2,6-Dinitrotoluene	ND	350
Benzyl Alcohol	ND	350	Diethylphthalate	ND	350
1,2-Dichlorobenzene	ND	350	4-Chlorophenyl-phenlyether	ND	350
2-Methylphenol	ND	350	Fluorene	ND	350
bis(2-chloroisopropyl)Ether	ND	350	4-Nitroaniline	ND	1800
4-Methylphenol	ND	350	4,6-Dinitro-2-Methylphenol	ND	1800
N-Nitroso-Di-n-Propylamine	ND	350	N-Nitrosodiphenylamine	ND	350
Hexachloroethane	ND	350	4-Bromophenyl-phenylether	ND	350
Nitrobenzene	ND	350	Hexachlorobenzene	ND	350
Isophorone	ND	350	Pentachlorophenol	ND	1800
2-Nitrophenol	ND	350	Phenanthrene	ND	350
2,4-Dimethylphenol	ND	350	Anthracene	ND	350
Benzoic Acid	ND	1800	Di-n-Butylphthalate	ND	350
bis(-2-Chloroethoxy)Methane	ND	350	Fluoranthene	ND	350
2,4-Dichlorophenol	ND	350	Pyrene	ND	350
1,2,4-Trichlorobenzene	ND	350	Butylbenzylphthalate	ND	350
Naphthalene	ND	350	3,3'-Dichlorobenzidine	ND	710
4-Chloroaniline	ND	350	Benzo(a)Anthracene	ND	350
Hexachlorobutadiene	ND	350	bis(2-Ethylhexyl)Phthalate	ND	350
4-Chloro-3-Methylphenol	ND	350	Chrysene	ND	350
2-Methylnaphthalene	ND	350	Di-n-Octyl Phthalate	ND	350
Hexachlorocyclopentadiene	ND	350	Benzo(b)Fluoranthene	ND	350
2,4,6-Trichlorophenol	ND	350	Benzo(k)Fluoranthene	ND	350
2,4,5-Trichlorophenol	ND	1800	Benzo(a)Pyrene	ND	350
2-Chloronaphthalene	ND	350	Indeno(1,2,3-cd)Pyrene	ND	350
2-Nitroaniline	ND	1800	Dibenzo(a,h)Anthracene	ND	350
Dimethyl Phthalate	ND	350	Benzo(g,h,i)Perylene	ND	350
Acenaphthylene	ND	350	Benzidine	ND	710
3-Nitroaniline	ND	1800			

Percent Solid of 93.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

67300-0315-1
Page 6 of 10

Lab Name : Bridgeport Environmental, Inc.
Client ID: 1014

Lab Sample ID:
69336

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Pesticides/PCBs

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 10/19/92
Date Analyzed: 10/23/92 07:33
Conc/Dil Factor: 10.05gm/10mL
Percent Moisture: 7

GPC Cleanup _ Yes ✓ No
Separatory Funnel Extraction _ Yes
Continuous Liquid-Liquid Extraction _ Yes

CAS Number		ug/L or (ug/Kg)	
319-84-6	Alpha-BHC.	5.4	U
319-87-7	Beta-BHC	5.4	U
319-86-8	Delta-BHC.	5.4	U
58-89-9	Gamma-BHC (Lindane). . .	5.4	U
76-44-8	Heptachlor	5.4	U
309-00-2	Aldrin	5.4	U
1024-57-3	Heptachlor Epoxide . . .	5.4	U
959-98-8	Endosulfan I	5.4	U
60-57-1	Dieldrin	5.4	U
72-55-9	4,4'-DDE	5.4	U
72-20-8	Endrin	5.4	U
33213-65-9	Endosulfan II.	11	U
72-54-8	4,4'-DDD	11	U
1031-07-8	Endosulfan Sulfate . . .	11	U
50-29-3	4,4'-DDT	11	U
72-43-5	Methoxychlor	270	U
7421-93-4	Endrin Aldehyde.	16	U
57-74-9	Chlordane.	260	U
8001-35-2	Toxaphene.	540	U
12674-11-2	Aroclor-1016.	270	U
11104-28-2	Aroclor-1221.	270	U
11141-16-5	Aroclor-1232.	270	U
53469-21-9	Aroclor-1242.	270	U
12672-29-6	Aroclor-1248.	270	U
11097-69-1	Aroclor-1254.	270	U
11096-82-5	Aroclor-1260.	270	U

U Undetected J Estimated value below detection level
* Amount reported is a mixture of Aroclors 1254 & 1260

Form I 7/85

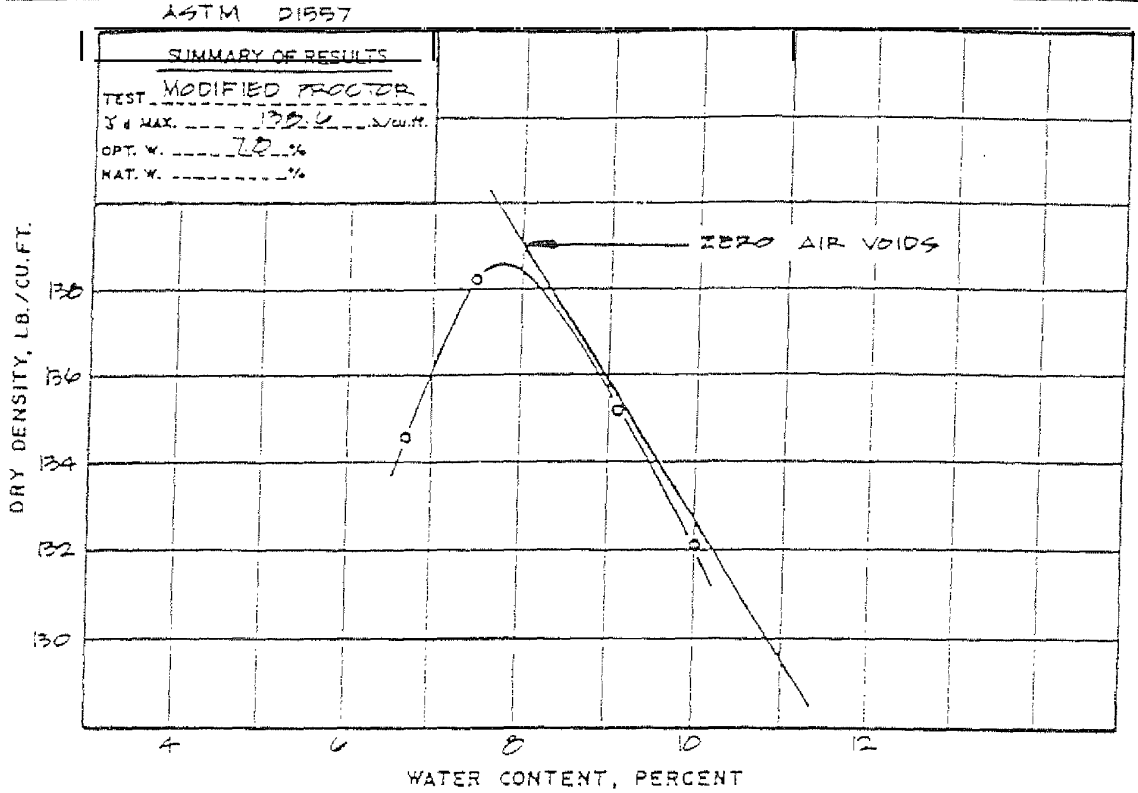
67300-0315-1
Page 7 of 10

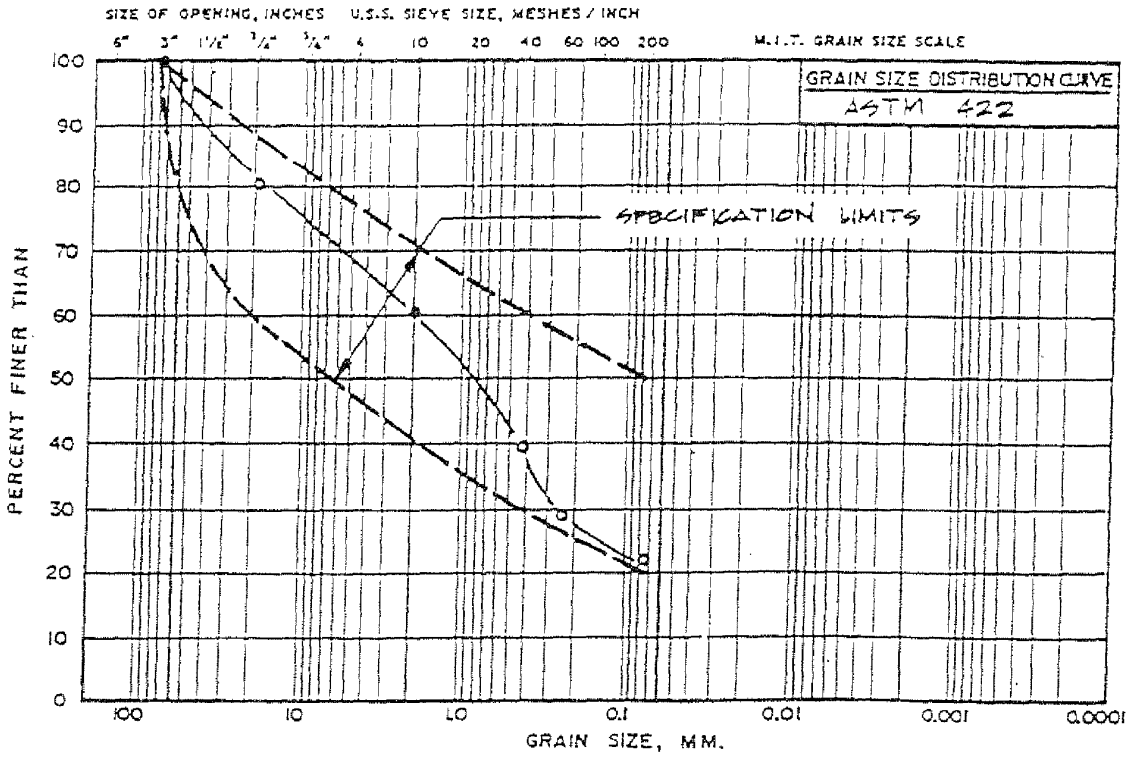
LABORATORY COMPACTION TEST RESULTS

MATERIAL: GLACIAL TILL, SOURCE: DEER ISLAND J.M. CASHMAN, DATE: 9-24-92

FIGURE

ASTM D1557





COBBLE SIZE	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE
	GRAVEL SIZE			SAND SIZE			FINE GRAINED	

McPHAIL ASSOCIATES INC.

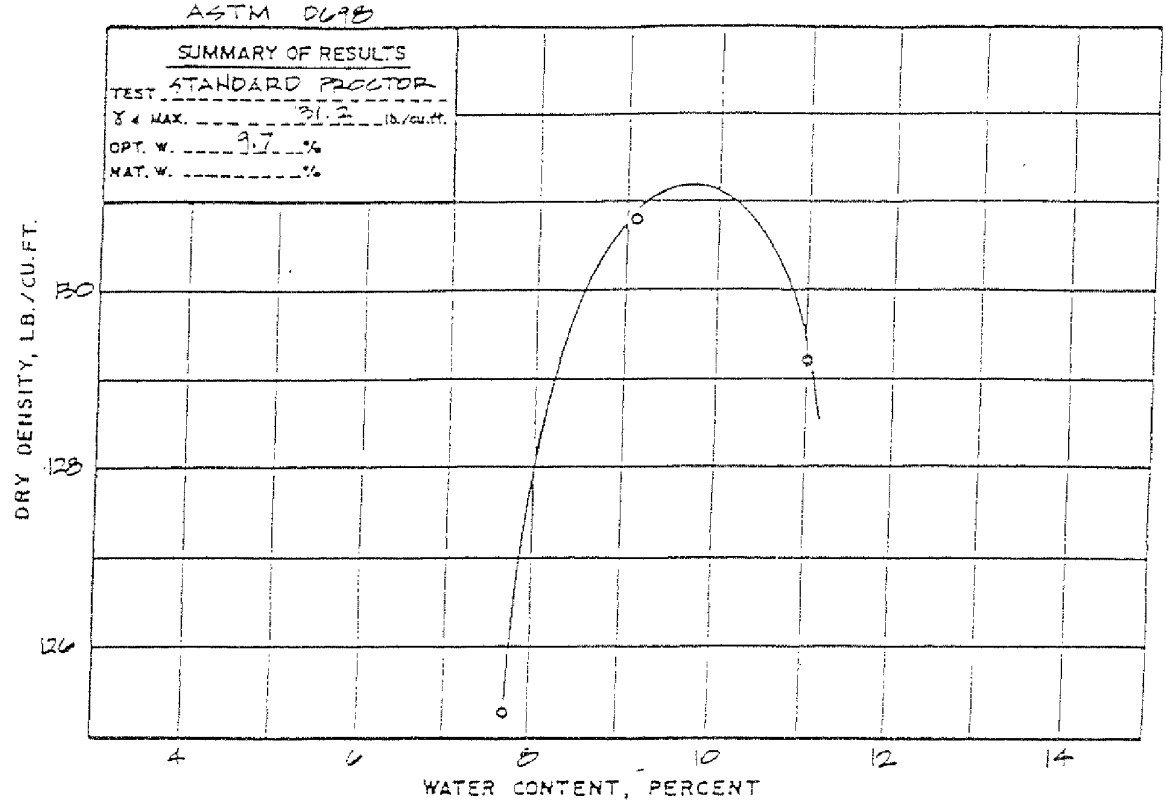
67300 - 031 S-1

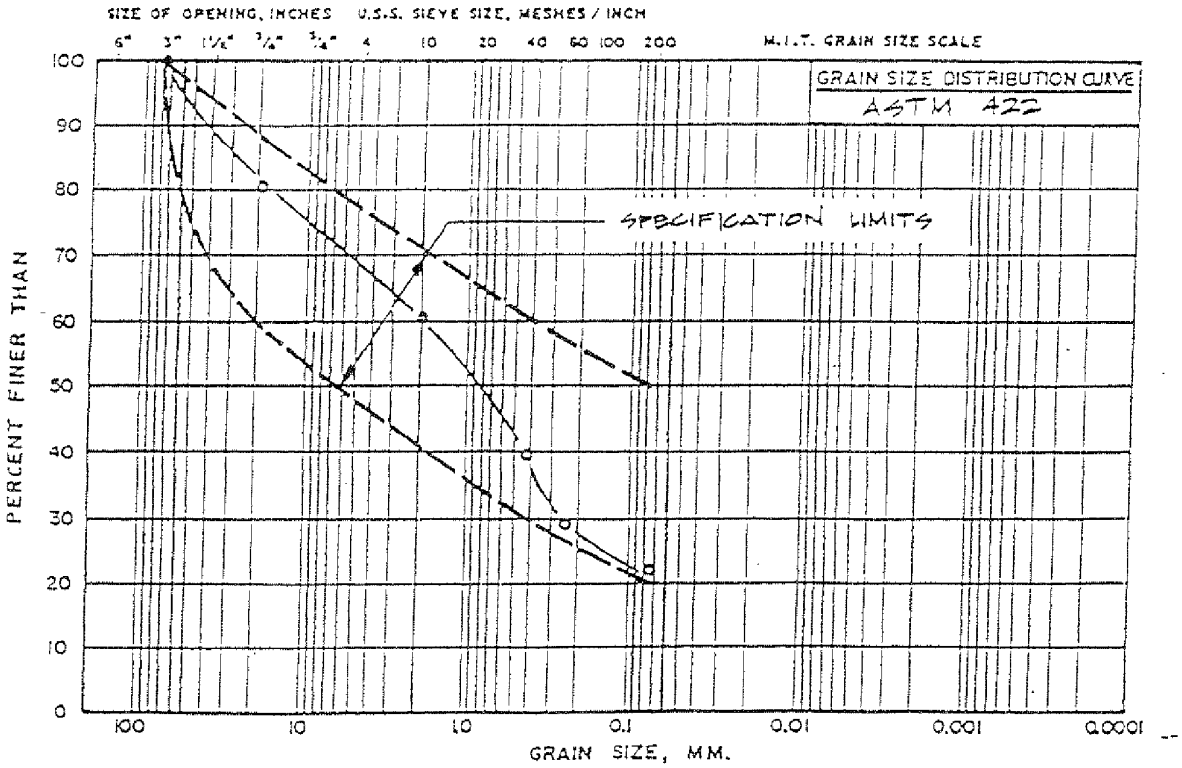
LABORATORY COMPACTION TEST RESULTS

MATERIAL: GLACIAL TILL, SOURCE: DEER ISLAND J.M. CASHMAN, DATE: 7-24-92

FIGURE

ASTM D698





COBBLE SIZE	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE
	GRAVEL SIZE			SAND SIZE			FINE GRAINED	

ATTERBERG LIMITS

SOIL SAMPLE Glacial Till Passing No. 200 Sieve
LOCATION Deer Island
BORING NO. _____ DEPTH _____
SAMPLE NO. _____
SPECIFIC GRAVITY 2.70

PROJECT Deer Island
FILE NO. _____
TEST NO. _____
DATE 3-26-92
TESTED BY JJF
CHECKED BY _____

PLASTIC LIMIT 19.1 BALANCE NO _____

DETERMINATION NO.	1	2	3
CONTAINER NO.	2	100	
WT. CONTAINER & WET SOIL IN g	36.33	41.18	
WT. CONTAINER & DRY SOIL IN g	32.23	36.44	
WT. WATER IN g	4.10	4.74	
WT. CONTAINER IN g	11.10	11.34	
WT. DRY SOIL IN g	21.13	25.1	
WATER CONTENT IN %	19.4	18.9	

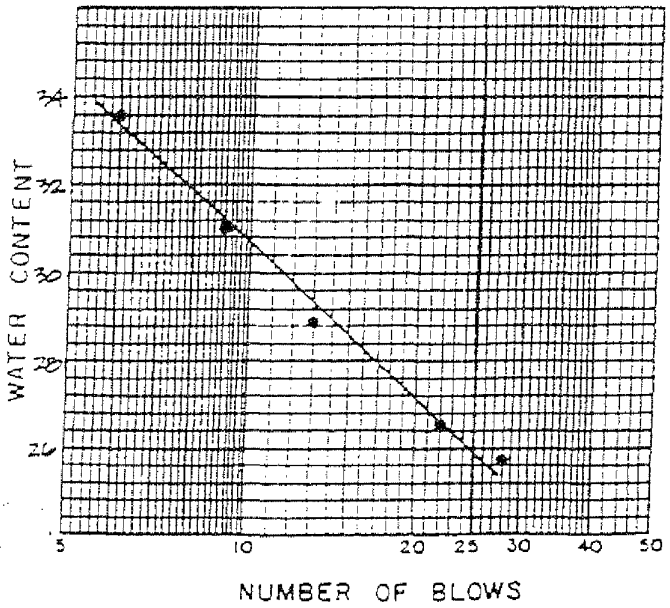
NATURAL WATER CONTENT

1	2	3
604.5		
744.0		
139.4		
60.5		
545.6		
11.1		

LIQUID LIMIT 25.8 BALANCE NO _____

DETERMINATION NO.	1	2	3	4	5	
NO. OF BLOWS	28	22	13	9	6	
CONTAINER NO.	5	13	14	19	1	
WT. CONTAINER & WET SOIL IN g	28.38	31.59	38.01	43.55	47.41	
WT. CONTAINER & DRY SOIL IN g	24.88	27.31	32.03	35.90	38.29	
WT. WATER IN g	3.50	4.28	5.98	7.65	9.12	
WT. CONTAINER IN g	11.28	11.25	11.33	11.20	11.12	
WT. DRY SOIL IN g	13.60	16.06	20.70	24.70	27.17	
WATER CONTENT IN %	28.7	26.6	28.9	31.0	33.6	

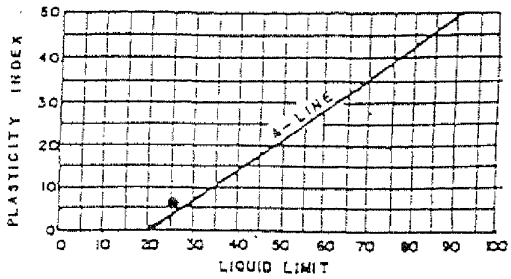
FLOW CURVE



RESULTS SUMMARY

NATURAL WATER CONTENT, w, 11.1
LIQUID LIMIT, w_L, 25.8
PLASTIC LIMIT, w_P, 19.1
PLASTICITY INDEX $W_L - W_P = 6.7$
FLOW INDEX + 11.8
WATER – PLASTICITY RATIO $\frac{w - w_P}{w_L - w_P}$

PLASTICITY CHART



MEMORANDUM

TO: Trustee Representative DATE: 11/11/92
FROM: Peter Neumann JOB NUMBER: 903-6400
RE: Review of CWM submittal "Soil Samples -- Deer Island (Cover Soil). Three 5 gallon buckets with locking lids.

Materials Reviewed:

1. Submittal consisted of three (3), five (5) gallon buckets of the following:

o Soil sample from Deer Island. The vendor was not identified.

2. Received submittal on 10/23/92.

Review Comments:

The proposed Cover Soils as indicated by the submitted tests are satisfactory for Cover Soils for areas where grading in areas with slopes flatter than 8 to 1 vertical.

Disposition of Submittal:
No Exceptions Taken in accordance with Section 01300 of the 100% Design Documents. Note qualification.

MEMORANDUM

TO: Trustee Representative DATE: 11/11/92
FROM: Peter Neumann JOB NUMBER: 903-6400
RE: Review of CWM submittal "Soil Samples -- Deer Island Compacted Fill"
Three 5 gallon buckets with locking lids.

Materials Reviewed:

1. Submittal consisted of three (3), five (5) gallon buckets of the following:

o Soil sample from Deer Island. The vendor was not identified.

2. Received submittal on 10/29/92.

Review Comments:

The soil tested did not meet the gradation specification for the Created Wetland Berm. The material tested meets the criteria for Compacted Fill.

Disposition of Submittal:
No Exceptions Taken in accordance with Section 01300 of the 100% Design Documents. Note qualification.

MEMORANDUM

TO: Trustee Representative, ISRT DATE: 09/01/93
FROM: Peter Neumann, Golder Associates Inc. JOB NUMBER: 933-6142
RE: Review of CWM submittal " Analytical Test Results for Cover Soil Sample from Hubbardston Supplied by Parrella Construction Co. 02223-2.07 (e) .

Materials Reviewed:

1. Submittal consisted of :

o 2 Soil sample from Hubbardston.
The vendor was Parrella Construction Co.

o Received Submittal on 08/26/93

Review Comments:

The proposed Cover Soils as indicated by the submitted tests are satisfactory for Cover Soils for areas where grading in areas with slopes flatter and steeper than 8 horizontal to 1 vertical.

o Chain-of-Custody for two samples, p. 1
o Analytical Test Results cover sheet from Toxikon Work Order 93-08-039;

VOC	ND, p. 3
Metals	Below threshold levels p. 4
Semi VOC	ND p. 5
Pesticides	ND p. 6

Analytical test results, are in accordance with the approved test methods by MDEP and EPA threshold criteria established for ISRT.

Disposition of Submittal:
No Exceptions Taken in accordance with Section 01300 of the 100% Design Documents.

Attachments:

Test Results:
Analytical Test Results

TOXIKON

225 Wildwood Ave., Woburn, MA 01801
Telephone (617) 933 6903
Fax (617) 933 9196

CHAIN OF CUSTODY RECORD

WORK ORDER #: R-08-039

DUE DATE: 08-18-93

COMPANY: Blue Remedial Services
ADDRESS: 41 Atlantic Ave
Woburn Mass
PHONE #: (617) 935-7110 FAX #: (617) 935-7114
P.O. #: 405608
CLIENT CONTACT: Chris Riley
PROJECT ID/LOCATION: IORT / Wobern

SAMPLE TYPE: 1. WATER, 2. SOIL, 3. SLUDGE, 4. OIL, 5. TISSUE, 6. DRINKING WATER, OTHER

CONTAINER TYPE: P - PLASTIC, G - GLASS, V - VOA

ANALYSES

TOXIKON #	SAMPLE IDENTIFICATION	SAMPLE TYPE	CONTAINER SIZE	CONTAINER TYPE	CONTAINER #	SAMPLING DATE	SAMPLING TIME	PRESERVATIVE	VOC (TCL) USEPA METHOD 8240	ACID/BASE/NEUT (TCL) USEPA 3550	PEST/PCBs (TCL) USEPA 3550	METALS (TAL) USEPA 6010	CYANIDE USEPA 9010	TPH USEPA 418.1 MOD. SERIES							COMMENTS
1	PH-1	2		V	1	08/03/93	1500	—	X												
2	PH-2	2		G	1	08/03/93	1500	—		X	X	X	X	X							

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Chris Riley	05-03-93	4-10-PM	[illegible]	8-3-93	16-10-PM
RELINQUISHED BY	DATE - -	TIME - -	RECEIVED BY:	DATE - -	TIME - -
RELINQUISHED BY	DATE - -	TIME - -	RECEIVED FOR LAB BY: MU	DATE 8-3-93	TIME [illegible]43

METHOD OF SHIPMENT

SPECIAL INSTRUCTIONS

☐ RUSH, ...BUSINESS DAY TURNAROUND

☐ ROUTINE

Sample Disposal Information

Are there any other known or suspected contaminants in these samples other than those listed above ?

☐ Yes ☐ No

Received: 08/03/93 08/24/93 08:23:43

REPORT TO: RUST REMEDIAL SERVICES
41 ATLANTIC AVE
WOBURN, MA 01801
(617)938-7190
ATTEN: CHRIS RILEY

PREPARED BY: TOXIKON CORPORATION
225 WILDWOOD AVE
WOBURN, MA 01801
ATTEN: PAUL LEZBERG
PHONE: (617)933-6903

CERTIFIED BY

CONTACT: KARL

CLIENT: RUST WOB SAMPLES: 2
COMPANY: RUST REMEDIAL SERVICES
FACILITY: 41 ATLANTIC AVE
WOBURN, MA 01801

MA CERT # MA064; TRACE METALS, SULFATE, CYANIDE, TURB., RES. FREE CHLORINE, Ca, TOTAL ALK., TDS, pH, THMs, VOC, PEST., NUTRIENTS, DEMAND, O&G, PHENOLICS, PCBs (OIL), CT DHS #PH-0563, NY #10778 FL HRS E87143, NJ DEP 59538, NC DNR286, SC 88002, NH 204091-C.

WORK ID: ISRT-WOBURN
TAKEN: 8/2/93 AT 15:00PM
TRANS:
TYPE: SOIL
P.O. #: 405608
INV. #: 005040

Verified By:
MA CERT# MA064.

Previously Reported on 08/18/93.
First Reported on 08/18/93.

SAMPLE IDENTIFICATION

01 PH-1
02 PH-2

TEST CODES and NAMES used on this workorder

8240	PURGEABLE ORGANICS VOA	SE	SELENIUM
8270	A/BN EXTRACTABLES	TL	THALLIUM
AG	SILVER	TPH IR	TPH BY IR
AL	ALUMINUM	V	VANADIUM
AS	ARSENIC	ZN	ZINC
BA	BARIUM		
BE	BERYLLIUM		
CA	CALCIUM		
CD	CADMIUM		
CN TOT	CYANIDE TOTAL		
CO	COBALT		
CR	CHROMIUM		
CU	COPPER		
FE	IRON		
HG	MERCURY		
K	POTASSIUM		
MEXTSG	METALS TOTAL EXT SOIL-GFAA		
MEX HG	METALS, EXT. FOR MERCURY		
MEX TS	METALS, TOTAL EXT., SOIL		
MG	MAGNESIUM		
MN	MANGANESE		
NA	SODIUM		
NI	NICKEL		
PB	LEAD		
PPCBS	PESTICIDES/PCB (SOIL)		
SB	ANTIMONY		

 TOXIKON CORP. REPORT Work Order # 93-08-039

Received: 08/03/93 Results by Sample

SAMPLE ID PH-1 FRACTION 01A TEST CODE 8240 NAME PURGEABLE ORGANICS VOA

Date & Time Collected 08/02/93 15:00:00 Category SOIL

PURGEABLE ORGANICS VOA

	RESULT	LIMIT		RESULT	LIMIT
Chloromethane	ND	2.0	Trichloroethene	ND	2.0
Bromomethane	ND	2.0	Dibromochloromethane	ND	2.0
Vinyl Chloride	ND	10	1,1,2-Trichloroethane	ND	2.0
Chloroethane	ND	2.0	Benzene	ND	2.0
Methylene Chloride	ND	10	cis-1,3-Dichloropropene	ND	2.0
Acetone	ND	50	2-Chloroethylvinylether	ND	2.0
Carbon Disulfide	ND	2.0	Bromoform	ND	2.0
1,1-Dichloroethene	ND	2.0	2-Hexanone	ND	4.0
Trichlorofluoromethane	ND	2.0	4-Methyl-2-pentanone	ND	4.0
1,1-Dichloroethane	ND	2.0	Tetrachloroethene	ND	2.0
Total 1,2-Dichloroethene	ND	2.0	1,1,2,2-Tetrachloroethane	ND	2.0
Chloroform	ND	2.0	Toluene	ND	2.0
1,2-Dichloroethane	ND	2.0	Chlorobenzene	ND	2.0
2-Butanone	ND	10	Ethyl Benzene	ND	2.0
1,1,1-Trichloroethane	ND	2.0	Styrene	ND	2.0
Carbon Tetrachloride	ND	2.0	Total Xylenes	ND	2.0
Vinyl Acetate	ND	2.0	1,2-Dichlorobenzene	ND	2.0
Bromodichloromethane	ND	2.0	1,3-Dichlorobenzene	ND	2.0
1,2-Dichloropropane	ND	2.0	1,4-Dichlorobenzene	ND	2.0
trans-1,3-Dichloropropene	ND	2.0			

Notes and Definitions for this Report:

DATE RUN: 08/04/93
ANALYST: GKC
INSTRUMENT: HP-1
DIL. FACTOR: 1.0
COMMENTS:
UNITS: ug/Kg

ND = not detected at detection limit

Received: 08/03/93 Results by Sample

SAMPLE ID P4-2 SAMPLE # 02 FRACTIONS: A,B,C

Date & Time Collected 08/02/93 15:00:00 Category SOIL

AG ND	AL 5310	AS 2.24	BA 22.3	BE ND	CA 651
mg/Kg DL=1.03	mg/Kg DL=10.3	mg/Kg DL=0.244	mg/Kg DL=0.513	mg/Kg DL=0.205	mg/Kg DL=2.57
CD 0.951	CN_TOT ND	CO 1.97	CR 8.65	CU 7.11	FE 9424
mg/Kg DL=0.513	mg/Kg DL=0.71	mg/Kg DL=0.513	mg/Kg DL=0.513	mg/Kg DL=0.513	mg/Kg DL=0.513
HG ND	K 1559	MG 1148	MN 133	NA 113	NI 2.82
mg/Kg DL=0.164	mg/Kg DL=25.7	mg/Kg DL=2.57	mg/Kg DL=0.103	mg/Kg DL=25.7	mg/Kg DL=2.05
PB 3.76	SB ND	SE ND	TL ND	TPH_IR ND	V 11.0
mg/Kg DL=0.244	mg/Kg DL=7.70	mg/Kg DL=0.244	mg/Kg DL=0.244	mg/Kg DL=40	mg/Kg DL=0.513
ZN 15.5					
mg/Kg DL=0.308					

TOXIKON CORP. REPORT Work Order # 93-08-039

Received: 08/03/93

Results by Sample

SAMPLE ID PH-2 FRACTION 02A TEST CODE 8270 NAME A/BN EXTRACTABLES

Date & Time Collected 08/02/93 15:00:00 Category SOIL

	RESULT	LIMIT
BASE NEUTRAL EXTRACTABLES		
bis(-2-Chloroethyl) ether	ND	340
1,3-Dichlorobenzene	ND	340
1,4-Dichlorobenzene	ND	340
1,2-Dichlorobenzene	ND	340
bis(2-Chloroisopropyl) ether	ND	340
N-Nitroso-Di-N-Propylamine	ND	340
Hexachloroethane	ND	340
Nitrobenzene	ND	340
Isophorone	ND	340
bis(2-Chloroethoxy) methane	ND	340
1,2,4-Trichlorobenzene	ND	340
Naphthalene	ND	340
Hexachlorobutadiene	ND	340
Hexachlorocyclopentadiene	ND	340
2-Chloronaphthalene	ND	340
Dimethyl phthalate	ND	340
Acenaphthylene	ND	340
Acenaphthene	ND	340
2,4-Dinitrotoluene	ND	340
2,6-Dinitrotoluene	ND	340
Diethylphthalate	ND	340
4-Chlorophenyl phenyl ether	ND	340
Fluorene	ND	340
N-Nitrosodiphenylamine	ND	340
4-Bromophenyl phenyl ether	ND	340
Hexachlorobenzene	ND	340
Phenanthrene	ND	340
Anthracene	ND	340
Di-n-butylphthalate	ND	340
Fluoranthene	ND	340
Pyrene	ND	340
Butyl benzyl phthalate	ND	340
3,3'-Dichlorobenzidine	ND	690
Benzo (a) anthracene	ND	340
bis (2-ethylhexyl)phthalate	ND	340

	RESULT	LIMIT
Chrysene	ND	340
Di-n-octyl phthalate	ND	340
Benzo(b)fluoranthene	ND	340
Benzo(k)fluoranthene	ND	340
Benzo(a)pyrene	ND	340
Indeno(1,2,3-cd)pyrene	ND	340
Dibenz(a,h)anthracene	ND	340
Benzo(g,h,i)perylene	ND	340
ACID EXTRACTABLES		
Phenol	ND	340
2-Chlorophenol	ND	340
Benzyl Alcohol	ND	690
2-Methylphenol	ND	340
4-Methylphenol	ND	340
2-Nitrophenol	ND	340
2,4-Dimethylphenol	ND	340
Benzoic Acid	ND	1700
2,4-Dichlorophenol	ND	340
4-Chloroaniline	ND	690
4-Chloro-3-methylphenol	ND	690
2-Methylnaphthalene	ND	340
2,4,6-Trichlorophenol	ND	340
2,4,5-Trichlorophenol	ND	340
2-Nitroaniline	ND	1700
3-Nitroaniline	ND	1700
2,4-Dinitrophenol	ND	1700
4-Nitrophenol	ND	1700
Dibenzofuran	ND	340
4-Nitroaniline	ND	1700
4,6-Dinitro-2-methylphenol	ND	1700
Pentachlorophenol	ND	1700

Notes and Definitions for this Report:

UNITS: ug/Kg
EXTRACTED: 08/09/93
DATE RUN: 08/11/93
ANALYST: KKP
INSTRUMENT: HP-3
DIL. FACTOR: 1.0

ND = not detected at detection limit

 TOXIKON CORP. REPORT Work Order # 93-08-039

Received: 08/03/93 Results by Sample

SAMPLE ID PH-2 FRACTION O2A TEST CODE PPCBS NAME PESTICIDES/PCB (SOIL)

Date & Time Collected 08/02/93 15:00:00 Category SOIL

PESTICIDES

	RESULT	LIMIT
Alpha-BHC	ND	0.010
Gamma-BHC (Lindane)	ND	0.010
Beta-BHC	ND	0.010
Heptachlor	ND	0.010
Delta-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.10

PCB

	RESULT	LIMIT
Aroclor 1016	ND	0.10
Aroclor 1221	ND	0.10
Aroclor 1232	ND	0.10
Aroclor 1242	ND	0.10
Aroclor 1248	ND	0.10
Aroclor 1254	ND	0.10
Aroclor 1260	ND	0.10
Aroclor 1262	ND	0.10
Aroclor 1268	ND	0.10

Notes and Definitions for this Report:

EXTRACTED: 08/06/93
UNITS: mg/Kg
DATE RUN: 08/06/93
ANALYST: AP
INSTRUMENT: HP 1
DIL. FACTOR: 1

ND = not detected at detection limit

TEST CODE 8240 NAME PURGEABLE ORGANICS VOA

EPA METHOD: 8240: Gas Chromatography/Mass Spectrometry for Volatile Organics.

Reference: Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods. EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

TEST CODE 8270 NAME A/BN EXTRACTABLES

EPA METHOD: 8270: Gas Chromatography / Mass Spectrometry for Semivolatile Organics; Capillary Column Technique.

Reference: Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods. EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

TEST CODE AS NAME ARSENIC

TEST CODE CN TOT NAME CYANIDE TOTAL

EPA METHOD: 335.3 for water sample

Reference: Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020 (Revised, March 1983). EPA/EMSL.

EPA METHOD: 9010 for soil sample

Reference: Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

TEST CODE MEXTSG NAME METALS TOTAL EXT SOIL-GFAA

REFERENCE:

EPA METHOD 3005. Acid Digestion of Waters for Total Recoverable or Dissolved Metals for Analysis by Flame Atomic Absorption Spectroscopy or Inductively Coupled Plasma Spectroscopy. Test Methods for Evaluating Physical/Chemical Methods. SW 846, 3rd Edition.

TEST CODE MEX HG NAME METALS, EXT. FOR MERCURY

REFERENCE:

EPA METHOD 245.1 Mercury. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020.

TEST CODE MEX TS NAME METALS, TOTAL EXT., SOIL

REFERENCE:

EPA METHOD 3050: Acid Digestion of Sediments, Sludges and Soils. Test Methods for Evaluating Solid Waste Physical/Chemical Methods. SW 846, 3rd Edition.

Received: 08/03/93

Test Methodology

TEST CODE TPH IR NAME TPH BY IR

EPA METHOD: 418.1 for water sample.

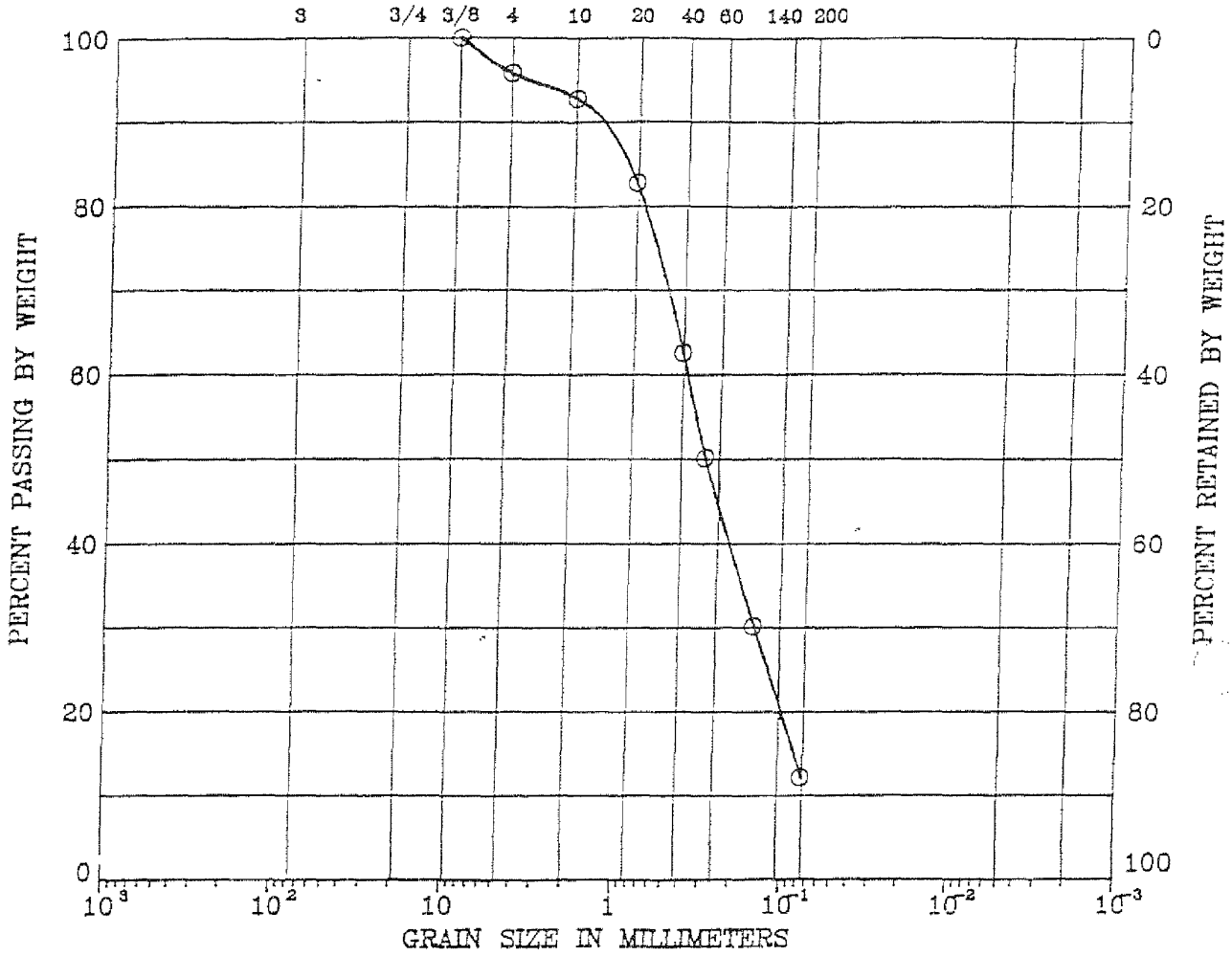
Reference: Methods for Chemical Analysis of Water and Wastes.
EPA 600/4-79-020 (Revised, March 1983). EPA/EMSL, Cincinnati, OH.

EPA METHOD: 9073 for soil sample.

Reference: Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.
EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER



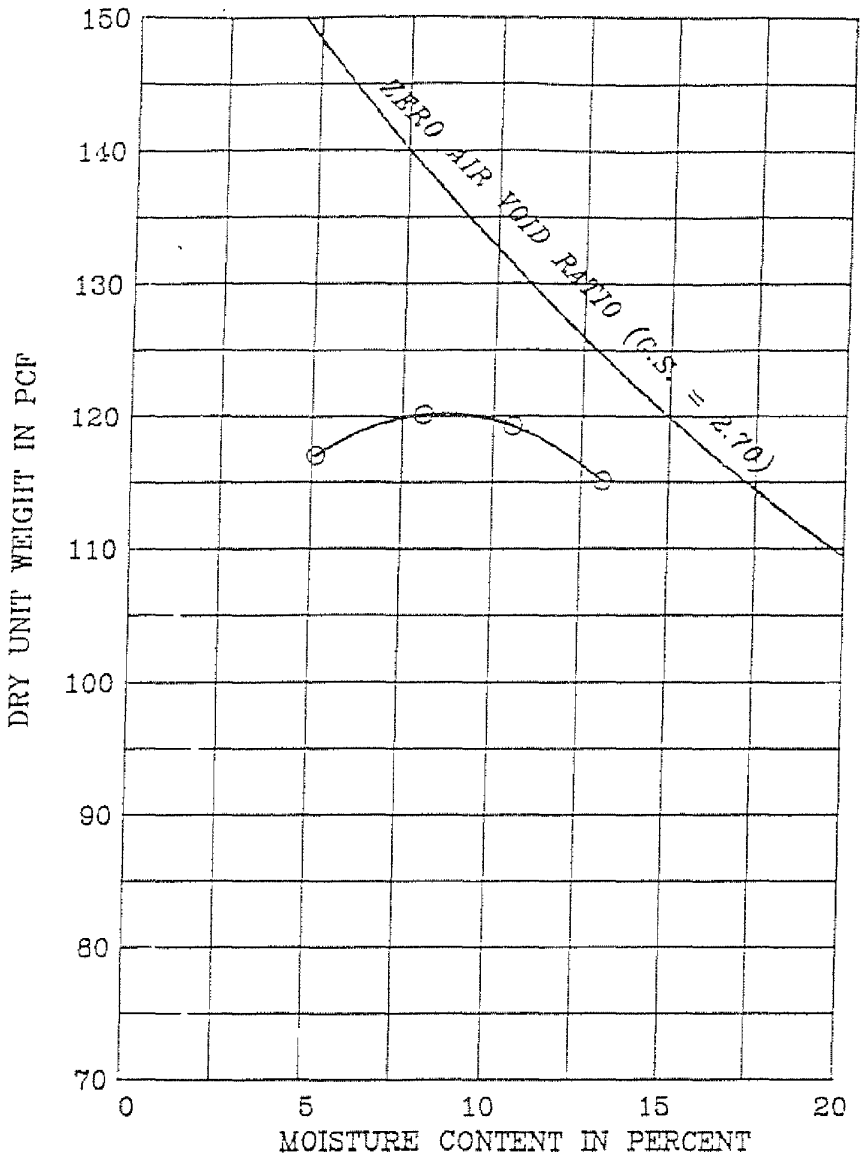
SYMBOL	SAMPLE NUMBER	DATE	LL (%)	PI (%)	DESCRIPTION
○	1608	11/14/90			SILTY SAND (SM)

BANK RUN SAND FILL

REVIEWED BY:
HARRY K. WETHERBEE III, P.E.

Source : MIXED COARSE AND FINE SAND

Project No.9370	[redacted]
U T S of Massachusetts	GRAIN SIZE DISTRIBUTION Figure No.1



SYMBOL	SAMPLE NUMBER	DATE	DESCRIPTION	TEST METHOD	OPTIMUM MOISTURE (%)	MAXIMUM DF DENSITY (pc
O	1608	11/14/90	SILTY SAND (SM)	ASTMD1557C	8.5	120.2

BANK RUN SAND FILL

REVIEWED BY:
HARRY K. WETHERBEE III, P.E.

Source : MIXED COARSE AND FINE SAND

Project No.9370	[redacted]
U T S of Massachusetts	COMPACTION TEST — Figure No.2

MEMORANDUM

TO: Trustee Representative, ISRT DATE: 4/8/93
FROM: Peter Neumann, Golder Associates Inc. JOB NUMBER: 903-6400
RE: Review of CWM submittal "Parrella Construction Cover Soil Samples (02242).

Materials Reviewed:

1. Submittal consisted of three (2), five (5) gallon buckets of the following:

o Soil sample from Hubbardston.
The vendor was Parrella Construction Co.

Review Comments:

The proposed Cover Soils as indicated by the submitted tests are satisfactory for Cover Soils for areas where grading in areas with slopes flatter and steeper than 8 horizontal to 1 vertical.

Analytical test results, in accordance with the approved test methods by MDEP and EPA, will be required of the proposed soil prior to placement.

Disposition of Submittal:
No Exceptions Taken in accordance with Section 01300 of the 100% Design Documents. Note qualification.

Attachments:

Test Results:
Sieve Test
Atterberg Test
Compaction Test

Professional Service Industries, Inc.

March 17, 1993 Report No. 446-30047-3

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of samples of soil as picked up by this laboratory on March 11, 1993:

1. Sample Description

Sample Number	Description	Source
C-77A	Cover Soil (2" minus)	Paralla Construction, Hubbardston
C-77B	Cover Soil (2" minus)	Roberto Loam, Townsend

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	C-77A	C-77B
1 1/2"		100
1		99
3/4	100	99
1/2	99	98
3/8	98	98
#4	97	97
10	95	93
20	84	92
40	61	77
50	44	64
80	24	44
200	6.6	17.8

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3. Moisture Density Relationship (ASTM D 1557, D 698)

Test	C-77a	C-77b
Max. Dry Density (D 1557, pcf)	112.9	116.2
Optimum Moisture (D 1557, %)	12.9	9.0
Max. Dry Density (D 698, pcf)	106.5	110.3
Optimum Moisture (D 698, %)	14.0	10.3

4. Atterberg Limits (ASTM D 4318)

Test	C-77a	C-77b
Plasticity Index	NP	NP

NP - nonplastic.

Sincerely,

Thomas Bowker
Laboratory Manager

TB/mm

psi

APPENDIX F.2

Soil Laboratory Test Results

APPENDIX F.2.1

Cover Soil and Granular Subbase Materials

APPENDIX F
SUMMARY OF COVER SOIL & GRANULAR SUBBASE LAB TEST RESULTS

SITE SAMPLE NUMBER	DATE	SOURCE	GRADATION (% PASSING) ASTM D422								ASTM D 4318	PROCTOR TESTS			
			6"	3"	2"	3/4"	#4	#10	#50	#200	PI	ASTM D 698 (PCF)	MOIST (%)	ASTM D 1557 (PCF)	MOIST (%)
C-77A	3/11/93	Hubbardstown				100	97	95	44	6.6	NP	106.5	14.0	112.9	12.9
C-77B	3/11/93	Townsend				99	97	93	64	17.8	NP	110.3	10.3	116.2	9.0
C-511A	8/16/93	Bardon Trimount				71	50	36	15	7.8		145.3			7.3
C-520	8/17/93	PJ Keating				82	77	50	23	13.2		139.5			6.3
C-608A	9/14/93	Hubbardstown				97	93	88	43	5.6		114.0			11.8
C-615	9/17/93	Deer Island				80	62	57	44	33.4	25/10	127.5			8.9
C-755	10/21/93	Hubbardstown				99	95	91	48	5.6		113.3			12.8
C-240B	5/25/94	Bardon Trimount				78	46	32	14	8.0		145.8			5.7
C-240C	5/25/94	Hubbardstown				98	94	91	65	8.4		108.9			13.7
C-240D	5/25/94	Deer Island				85	63	58	47	35.1		134.6			7.4
C-400	7/6/94	Hubbardstown				99	96	95	61	7.3		110.3			10.3
C-854	10/21/94	Hubbardstown				98	95	94	58	7.3		109.5			8.4
C-928A	11/9/94	Hubbardstown				100	97	96	30	2.5	NP	104.8			13.6
C-992	11/30/94	Hubbardstown				100	97	96	71	10.9		107.0			12.8
C-606	8/24/94	RR Ballast		94	93	52	39	35	15	2.5		126.5			8.6
C-766	9/19/95	Deer Island				84	70	64	52	39.1	3	135.6			6.6
C-801b	9/25/95	Hubbardstown				100	98	95	63	11.9		114	10.7	116.2	9.3
C-452a	7/10/95	Hubbardstown 1E				100	98	96	44	4.0					
C-452b	7/10/95	Hubbardstown 2S				92	87	84	48	7.1					
C-452c	7/10/95	Hubbardstown 3W				100	98	96	71	15.7					
C-452d	7/10/95	Hubbardstown 4N				100	96	93	51	6.7					
C-356	6/9/95	Hubbardstown				96	94	92	47	4.0					

Professional Service Industries, Inc.

March 17, 1993 Report No. 446-30047-3

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of samples of soil as picked up by this laboratory on March 11, 1993:

1. Sample Description

Sample Number	Description	Source
C-77A	Cover Soil (2" minus)	Paralla Construction, Hubbardston
C-77B	Cover Soil (2" minus)	Roberto Loam, Townsend

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	C-77A	C-77B
1 1/2"		100
1		99
3/4	100	99
1/2	99	98
3/8	98	98
#4	97	97
10	95	93
20	84	92
40	61	77
50	44	64
80	24	44
200	6.6	17.8

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3. Moisture Density Relationship (ASTM D 1557, D 698)

Test	C-77a	C-77b
Max. Dry Density (D 1557, pcf)	112.9	116.2
Optimum Moisture (D 1557, %)	12.9	9.0
Max. Dry Density (D 698, pcf)	106.5	110.3
Optimum Moisture (D 698, %)	14.0	10.3

4. Atterberg Limits (ASTM D 4318)

Test	C-77a	C-77b
Plasticity Index	NP	NP

NP - nonplastic.

Sincerely,

Thomas Bowker
Laboratory Manager

TB/mm

psi

Professional Service Industries, Inc.

August 20, 1993 Report No. 446-30047-21

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 8/16/93:

1. Sample Description

Sample Number	Description	Source
C-511a	1 1/2" Crushed Aggregate Base	Bardon Trimount, Swampscott, MA

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
2"	100
1 1/2	96
1	80
3/4	71
1/2	62
3/8	58
#4	50
10	36
20	23
40	17
50	15
80	12
200	7.8

3. Moisture Density Relation (AASHTO T-180, ASTM D 1557)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	145.3
Optimum Moisture (%)	7.3

Sincerely,

Thomas Bowker
Division Manager

TB/mm

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Professional Service Industries, Inc.

September 3, 1993 Report No. 446-30047-32

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 8/17/93:

1. Sample Description

Sample Number	Description	Source
C-520	1 1/2" Crushed Aggregate Base	P.J. Keating

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (Road Structural Fill)
3"	100	90-100
1 1/2	100	
1	92	
3/4	82	50-90
1/2	79	
3/8	78	
#4	77	
10	50	40-80
20	32	
40	26	
50	23	20-60
80	20	
200	13.2	5-15

3. Moisture Density Relation (ASTM D 698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	139.5
Optimum Moisture (%)	6.3

Remarks: Sample conforms to specification requirements.

Sincerely,

Thomas Bowker
Division Manager

TB/mm

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Professional Service Industries, Inc.

October 1, 1993

Report No. 446-30047-64

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site
Woburn, MA

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 9/14/93:

1. Sample Description

Sample Number	Description	Source
C-608a	Sand with Silt	Hubbardston

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
1 1/2"	100
1	98
3/4	97
1/2	96
3/8	95
#4	93
10	88
20	77
40	57
50	43
80	24
200	5.6

3. Moisture Density Relation (ASTM D698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	114.0
Optimum Moisture (%)	11.8

Sincerely,

Thomas Bowker
Division Manager

TB/mm

Professional Service Industries, Inc.

October 1, 1993

Report No. 446-30047-65

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site
Woburn, MA

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 9/17/93:

1. Sample Description

Sample Number	Description	Source
C-615	Sandy Lean Clay with Gravel	Deer Island

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
3"	100
2	92
1 1/2	90
1	83
3/4	80
1/2	72
3/8	66
#4	62
10	57
20	52
40	47
50	44
80	40
200	33.4

3. Moisture Density Relation (ASTM D698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	127.5
Optimum Moisture (%)	8.9

4. Plasticity Index (ASTM D 4318)

Test	Result
Liquid Limit	25
Plastic Limit	15
Plasticity Index	10

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/mm

psi

Professional Service Industries, Inc.

November 11, 1993

Report No. 446-30047-92

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site
Woburn, MA

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 10/21/93:

1. Sample Description

Sample Number	Description	Source
C-755	Sand	Hubbardston

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
1"	100
3/4	99
1/2	98
3/8	96
#4	95
10	91
20	81
40	62
50	48
80	27
200	5.6

3. Moisture Density Relation (ASTM D698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	113.3
Optimum Moisture (%)	12.8

Sincerely,

Thomas Bowker
Division Manager

TB/jb

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Professional Service Industries, Inc.

REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

PROJECT: Industri-Plex Site
Woburn, MA

DATE: November 11, 1993

OUR REPORT NO.: 446-30047-92

TEST DATA

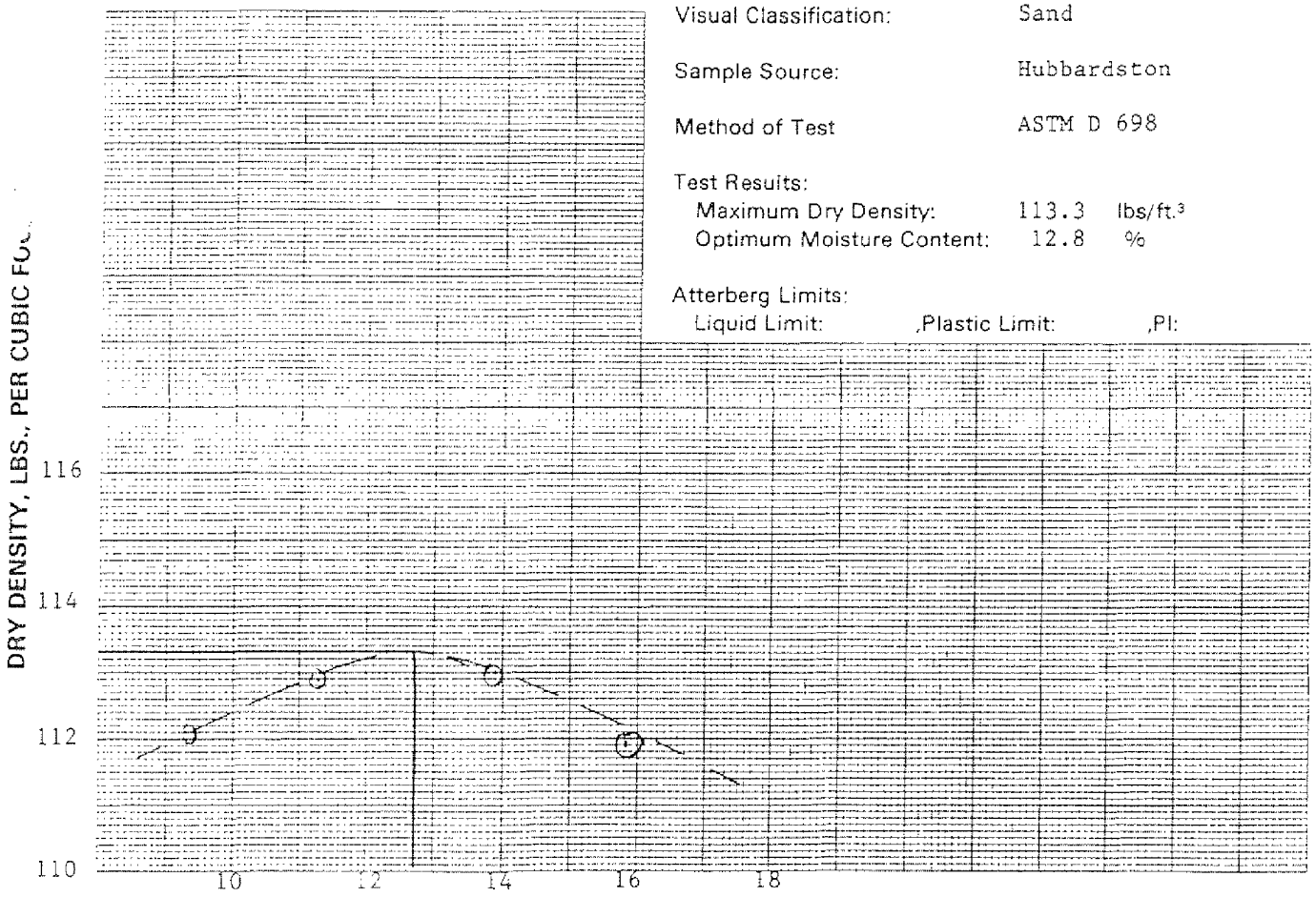
Visual Classification: Sand

Sample Source: Hubbardston

Method of Test ASTM D 698

Test Results:
Maximum Dry Density: 113.3 lbs/ft.³
Optimum Moisture Content: 12.8 %

Atterberg Limits:
Liquid Limit: ,Plastic Limit: ,PI:



MOISTURE CONTENT, PERCENT OF DRY WEIGHT

Respectfully submitted,
Professional Service Industries, Inc.

Professional Service Industries, Inc.

June 7, 1994 Report No. 446-30047-159

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 5/25/94.

1. Sample Description

Sample Number	Description	Source
C-240b	1 1/2" Cr. Agg. Base	Bardon Trimount

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
2"	100
1 1/2	98
1	89
3/4	78
1/2	63
3/8	55
#4	46
10	32
20	21
40	16
50	14
80	12
200	8.0

3. Moisture Density Relation (D698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	145.8
Optimum Moisture (%)	5.7

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

PROJECT: Industri-Plex

DATE: June 7, 1994

OUR REPORT NO.: 446-30047-159

TEST DATA

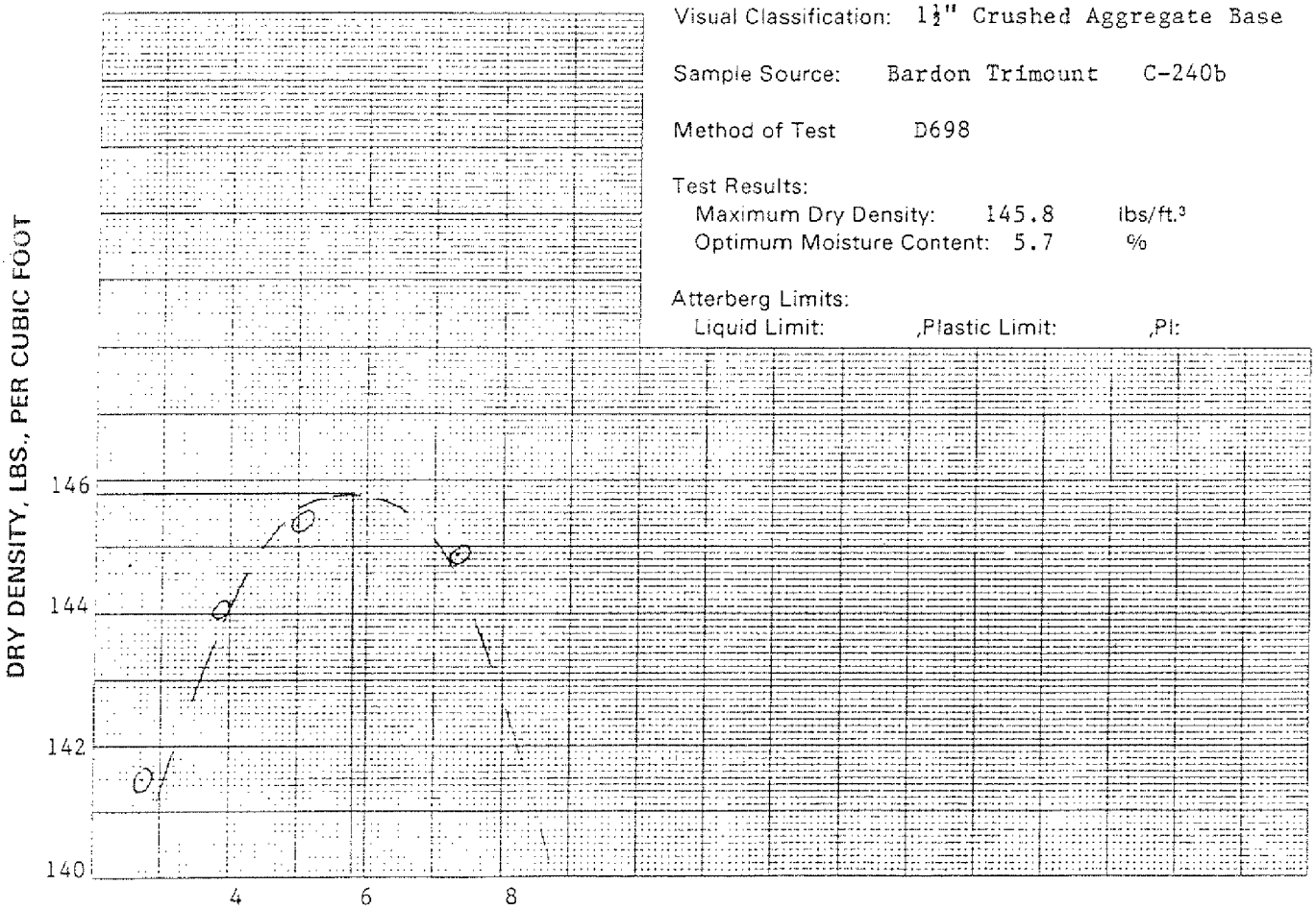
Visual Classification: 1½" Crushed Aggregate Base

Sample Source: Bardon Trimount C-240b

Method of Test D698

Test Results:
Maximum Dry Density: 145.8 lbs/ft.³
Optimum Moisture Content: 5.7 %

Atterberg Limits:
Liquid Limit: ,Plastic Limit: ,PI:



Respectfully submitted,
Professional Service Industries, Inc.

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Professional Service Industries, Inc.

June 7, 1994 Report No. 446-30047-160

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 5/25/94.

1. Sample Description

Sample Number	Description	Source
C-240c	Sand with Silt some Gravel	Hubbardston Sand & Gravel

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
1 1/2	100
1	99
3/4	98
1/2	97
3/8	96
#4	94
10	91
20	85
40	76
50	65
80	40
200	8.4

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3. Moisture Density Relation (D698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	108.9
Optimum Moisture (%)	13.7

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

psi

Professional Service Industries, Inc.

REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

PROJECT: Industri-Plex

DATE: June 7, 1994

OUR REPORT NO.: 446-30047-160

TEST DATA

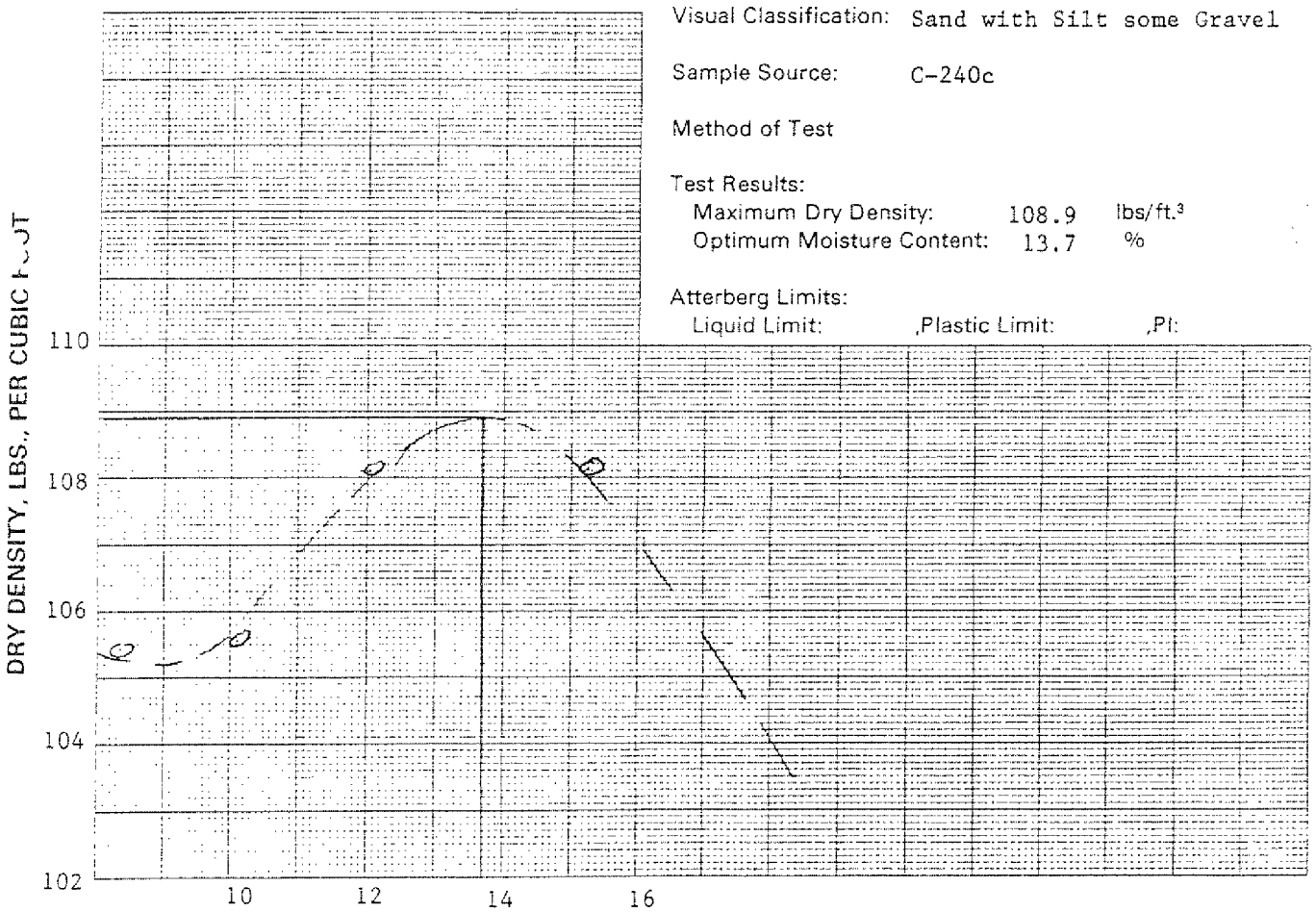
Visual Classification: Sand with Silt some Gravel

Sample Source: C-240c

Method of Test

Test Results:
Maximum Dry Density: 108.9 lbs/ft.^{3}
Optimum Moisture Content: 13.7 %

Atterberg Limits:
Liquid Limit: ,Plastic Limit: ,PI:



Respectfully submitted,
Professional Service Industries, Inc.

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

PSI A-100-1

Professional Service Industries, Inc.

June 15, 1994 Report No. 446-30047-172

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 02801

Re: Industri-Plex

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 5/25/94.

1. Sample Description

Sample Number	Description	Source
C-240d	Lean Clay with Silt & Gravel	On Site Deer Island

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
2"	100
1 1/2	96
1	91
3/4	85
1/2	76
3/8	68
#4	63
10	58
20	54
40	50
50	47
80	43
200	35.1

3. Moisture Density Relation (ASTM D-698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	134.6
Optimum Moisture (%)	7.4

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

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Professional Service Industries, Inc.

July 12, 1994 Report Number 446-30047-199

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of sand as taken by this laboratory on 7/6/94.

1. Sample Description

Sample No.	Description	Source
C-400	Sand	Parella Const. Huddbardston

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
1"	100
3/4	99
1/2	98
3/8	97
#4	96
10	95
20	87
40	73
50	61
80	36
200	7.3

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3. Moisture Density Relationship (ASTM D698)

Test	Result
Maximum Dry Density (p.c.f.)	110.3
Optimum Moisture (%)	10.3

4. Permeability Test Results (ASTM D2434)

Test	Result
Permeability	5.6 x 10 -3 cm/sec
Initial Compaction	94.7
Initial Moisture Content	10.9

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker

Thomas Bowker
Division Manager

TB/jll

psi

Professional Service Industries, Inc.

REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

PROJECT: Industri-Plex Site

DATE: July 12, 1994

OUR REPORT NO.: 446030047-199

TEST DATA

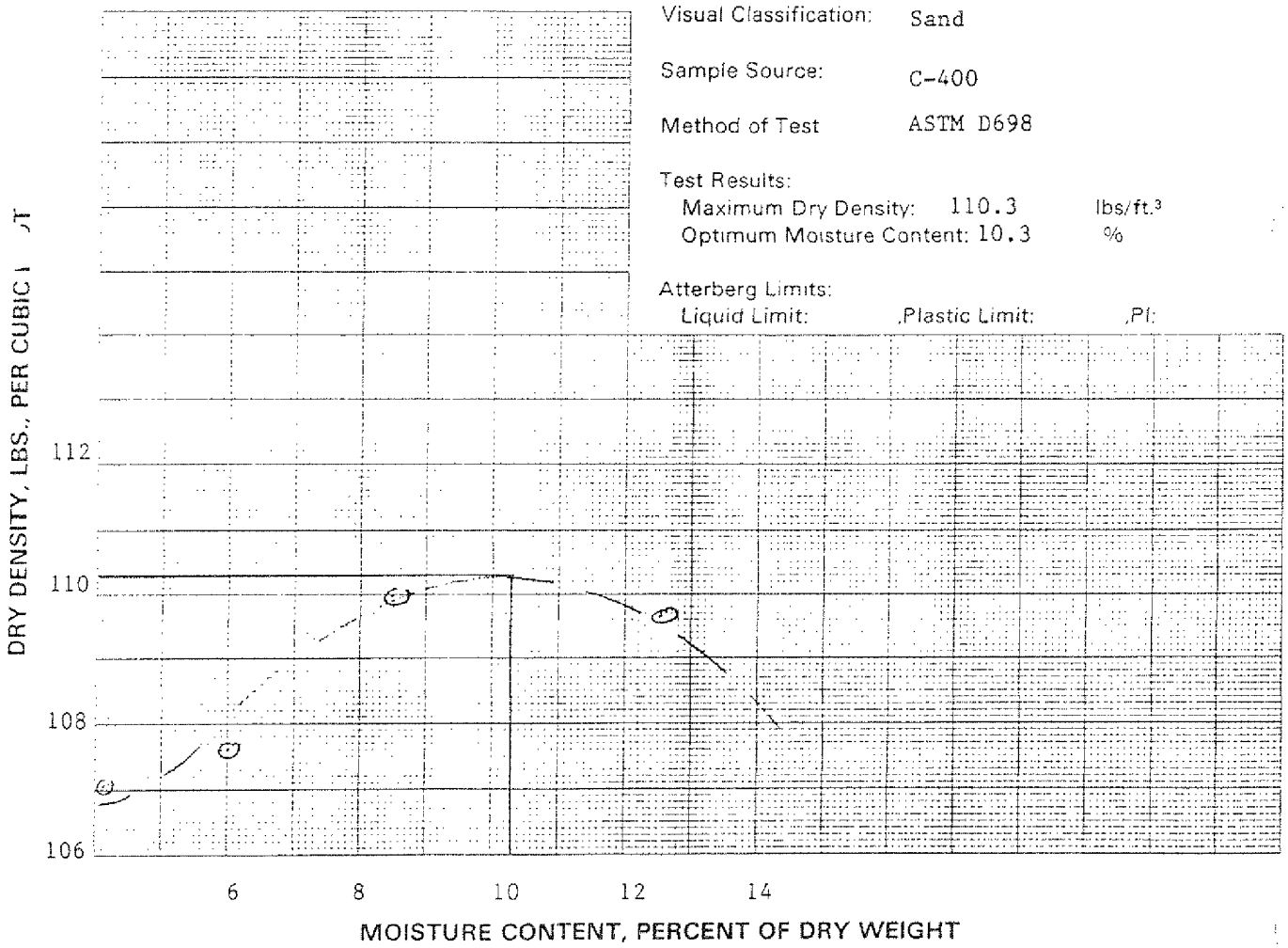
Visual Classification: Sand

Sample Source: C-400

Method of Test ASTM D698

Test Results:
Maximum Dry Density: 110.3 lbs/ft.³
Optimum Moisture Content: 10.3 %

Atterberg Limits:
Liquid Limit: Plastic Limit: PI:



Respectfully submitted,
Professional Service Industries, Inc.

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

PSI A-100-1

Professional Service Industries, Inc.

November 11, 1994 Report Number 446-30047-321

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 10/21/94.

1. Sample Description

Sample Number	Description	Source
C-854	Sand	Hubbardston S & G

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
1 1/2"	100
1	99
3/4	98
1/2	97
3/8	96
#4	95
10	94
20	88
40	73
50	58
80	32
200	7.3

3. Moisture Density Relation (ASTM D-698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	109.5
Optimum Moisture (%)	8.4

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

November 21, 1994 Report Number 446-30047-333

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 02801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of sand as taken by this laboratory on 11/9/94.

1. Sample Description

Sample Number	Description	Source
C-928a	Sand	Hubbardston S & G

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
3/4"	100
1/2	99
3/8	98
#4	97
10	96
20	91
40	50
50	30
80	12
200	2.5

3. Moisture Density Relation (ASTM D698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	104.8
Optimum Moisture (%)	13.6

4. Plasticity Index (ASTM D4318)

Sample	Result
C-928a	Non-Plastic

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

PROJECT: Industri-Plex Site

DATE: November 21, 1994

OUR REPORT NO.: 446-30047-333

TEST DATA

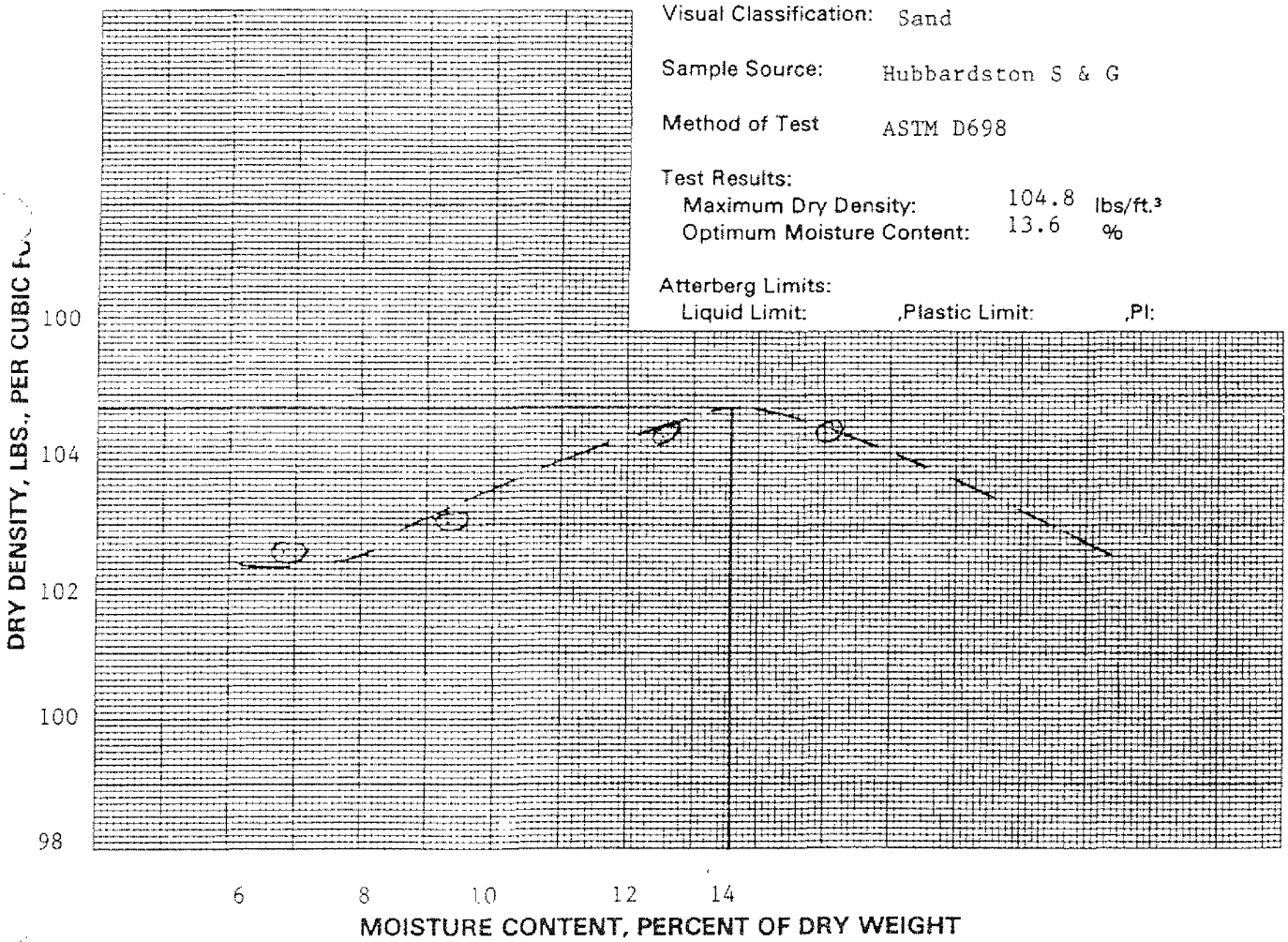
Visual Classification: Sand

Sample Source: Hubbardston S & G

Method of Test ASTM D698

Test Results:
Maximum Dry Density: 104.8 lbs/ft.³
Optimum Moisture Content: 13.6 %

Atterberg Limits:
Liquid Limit: ,Plastic Limit: ,PI:



Respectfully submitted,
Professional Service Industries, Inc.

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

PSI A-100-1

Professional Service Industries, Inc.

December 9, 1994 Report Number 446-30047-347

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

RE: Industri-Plex Site

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 11/30/94.

1. Sample Description

Sample Number	Description	Source
C-992	Sand	Hubbardston S & G

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
1"	100
3/4	100
1/2	99
3/8	98
#4	97
10	96
20	91
40	81
50	71
80	43
200	10.9

3. Moisture Density Relation (ASTM D-698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	107.0
Optimum Moisture (%)	12.8

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

PROJECT: Industri-Plex Site

DATE: December 9, 1994

OUR REPORT NO.: 446-30047-347

TEST DATA

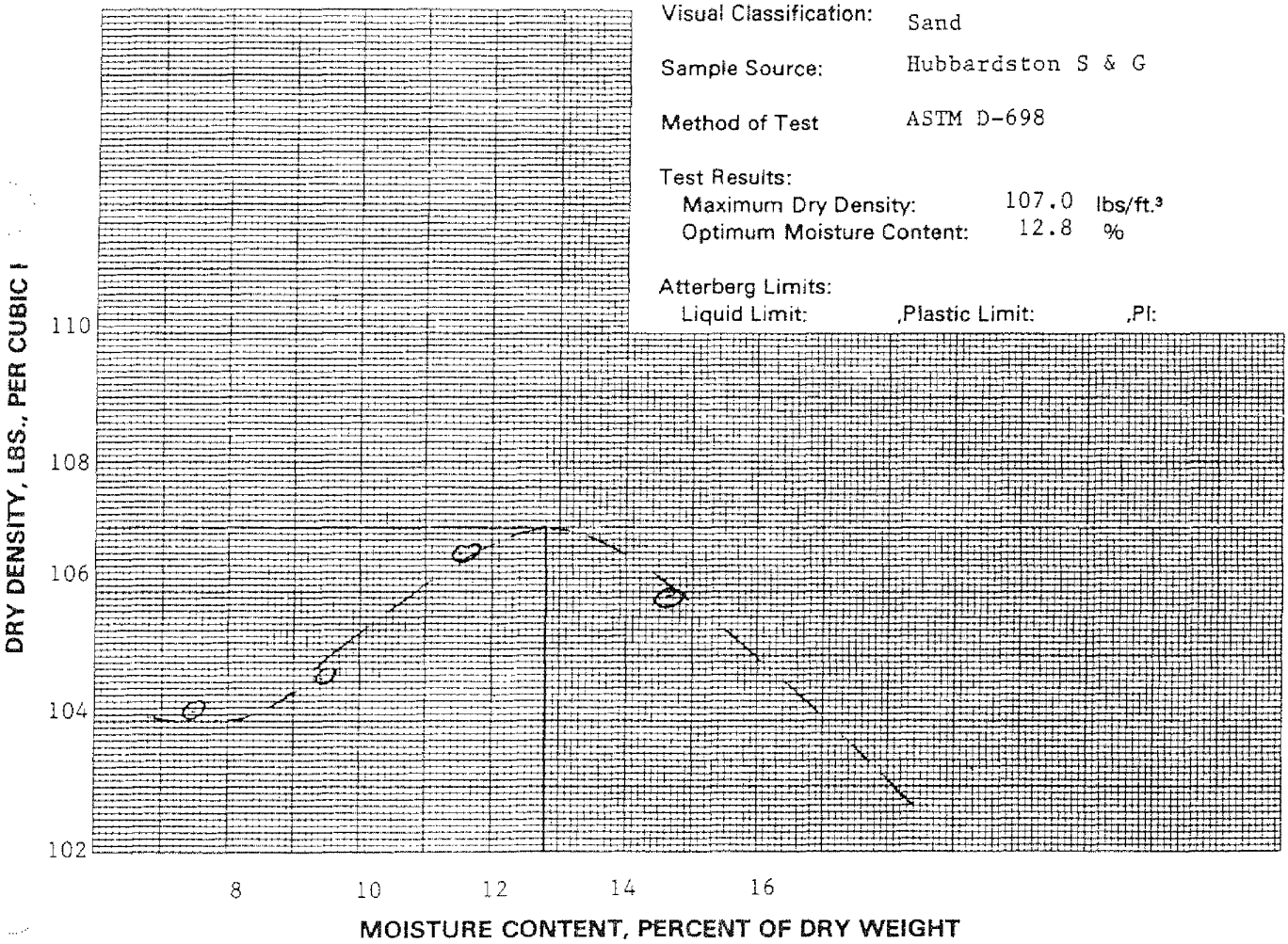
Visual Classification: Sand

Sample Source: Hubbardston S & G

Method of Test ASTM D-698

Test Results:
Maximum Dry Density: 107.0 lbs/ft.³
Optimum Moisture Content: 12.8 %

Atterberg Limits:
Liquid Limit: ,Plastic Limit: ,PI:



Respectfully submitted,
Professional Service Industries, Inc.

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

PSI A-100-1

Professional Service Industries, Inc.

August 29, 1994

Report Number 446-30047-248

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 10801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of soil as taken by this laboratory on 8/24/94.

1. Sample Description

Sample Number	Description	Source
C-606	Crushed Aggregate Base	On Site RR Ballast

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
4"	100
3	94
2	93
1 1/2	82
1	67
3/4	52
1/2	45
3/8	42
#4	39
10	35
20	30
40	21
50	15
80	8
200	2.5

3. Moisture Density Relation (ASTM D698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	126.5
Optimum Moisture (%)	8.6

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

PROJECT: Industri-Plex Site

DATE: August 29, 1994

OUR REPORT NO.: 446-30047-248

TEST DATA

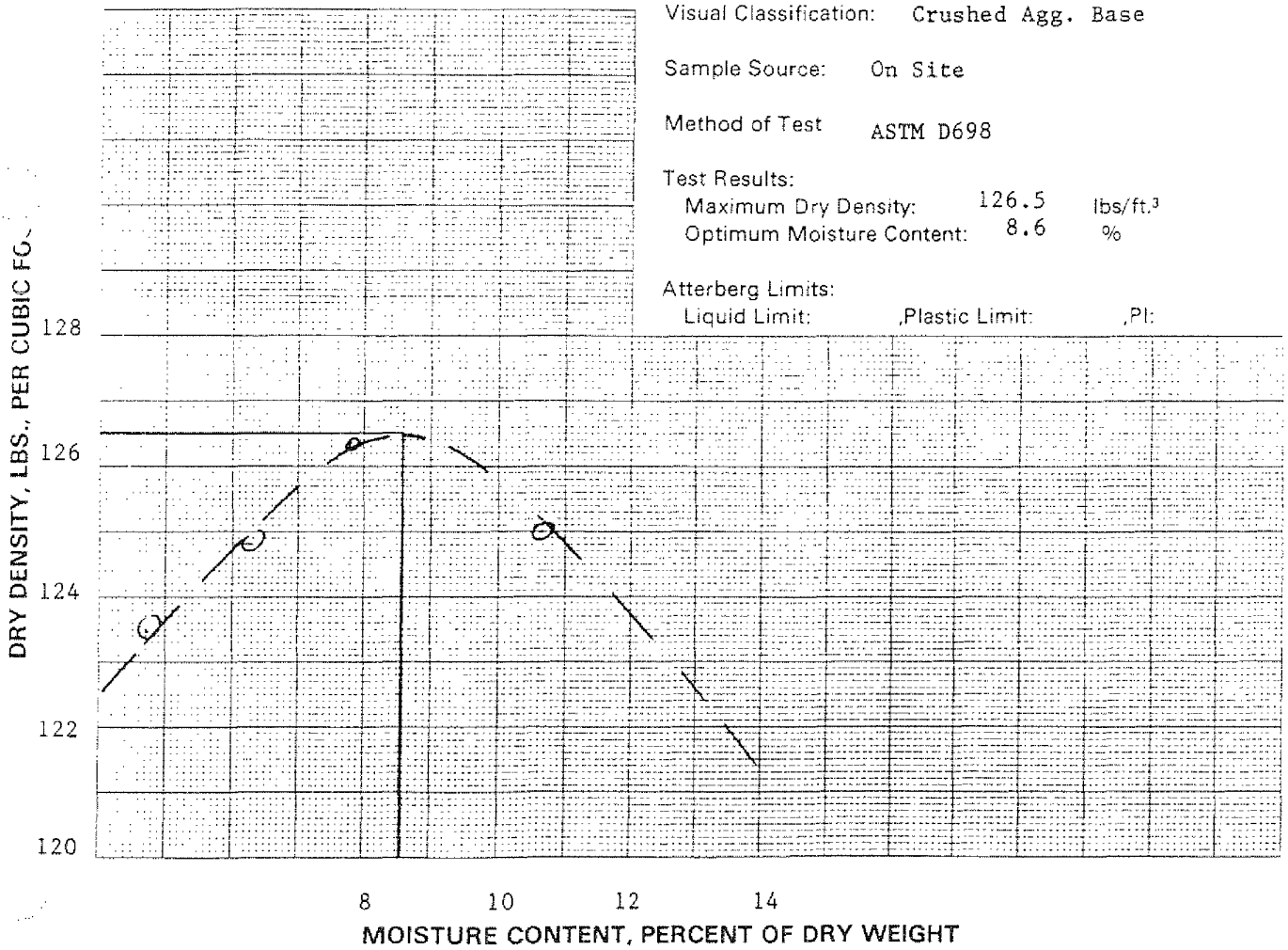
Visual Classification: Crushed Agg. Base

Sample Source: On Site

Method of Test ASTM D698

Test Results:
Maximum Dry Density: 126.5 lbs/ft.^{3}
Optimum Moisture Content: 8.6 %

Atterberg Limits:
Liquid Limit: ,Plastic Limit: ,PI:



Respectfully submitted,
Professional Service Industries, Inc.

PSI A-100-1

Professional Service Industries, Inc.

Report Number 446-30047-547

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of sample of soil as taken by this laboratory on 9/19/95.

1. Sample Description

Sample No.	Description	Source
C-766	Sandy Lean Clay with Gravel	Deer Island

2. Sieve Analysis (% passing by weight)

Sieve Size	Result
1 1/2"	100
1	92
3/4	84
1/2	78
3/8	76
#4	70
10	64
20	59
40	54
50	52
80	47
200	39.1

3. Moisture Density Relation (ASTM D698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	135.6
Optimum Moisture (%)	6.6

4. Liquid Limit, Plastic Limit & Plasticity Index (ASTM D4318)

Test	Result
Liquid Limit	21
Plastic Limit	18
Plasticity Index	3

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: Mr. David Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

PROJECT: Industri-Plex Site

DATE: October 6, 1995

OUR REPORT NO.: 446-30047-547

TEST DATA

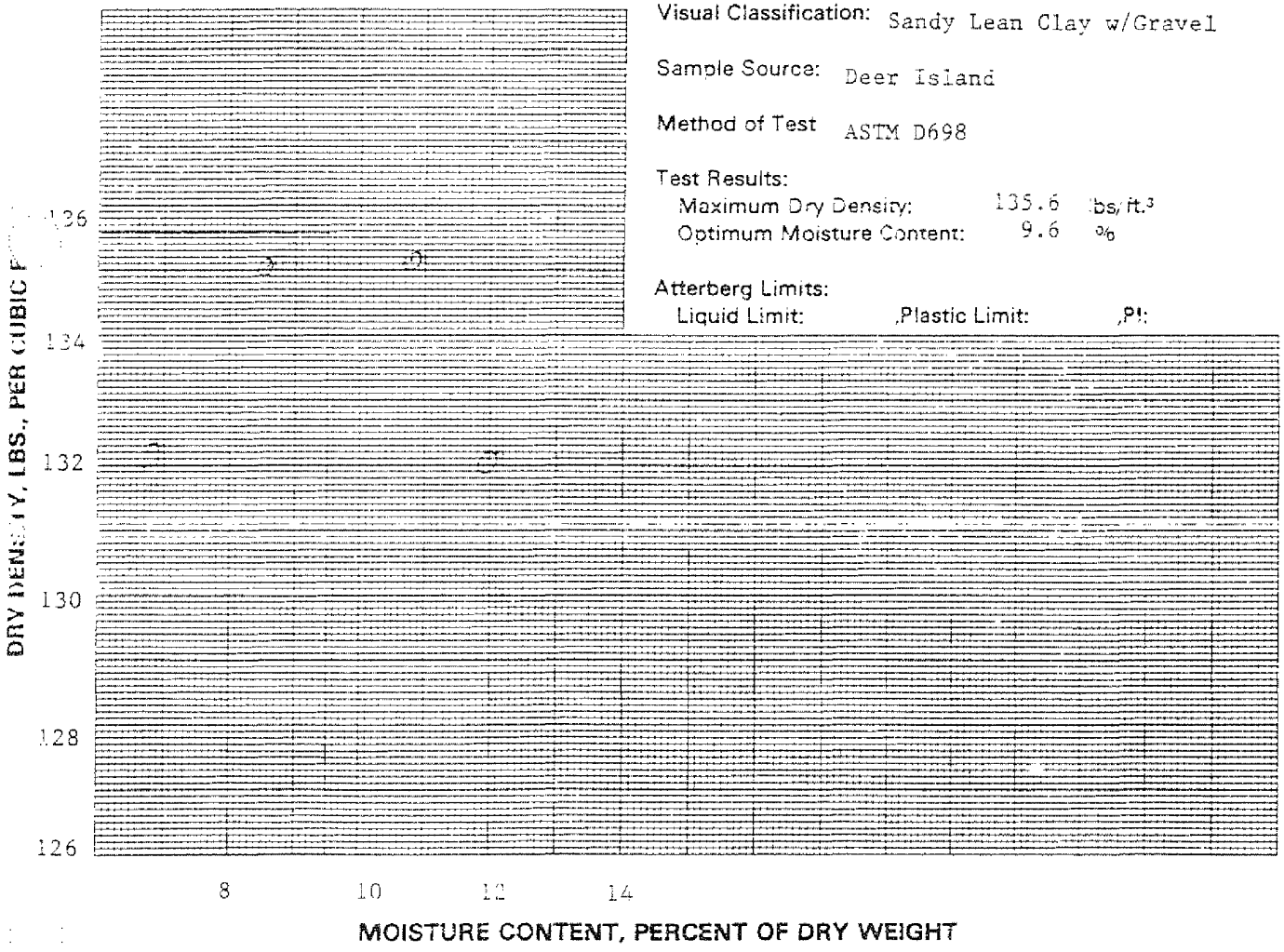
Visual Classification: Sandy Lean Clay w/Gravel

Sample Source: Deer Island

Method of Test ASTM D698

Test Results:
Maximum Dry Density: 135.6 lbs/ft.³
Optimum Moisture Content: 9.6 %

Atterberg Limits:
Liquid Limit: Plastic Limit: PI:



Respectfully submitted,
Professional Service Industries, Inc.

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

PSI A-100-1

Professional Service Industries, Inc.

October 3, 1995 Report Number 446-30047-542

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of sample of soil as taken by this laboratory on 9/25/95.

1. Sample Description

Sample No.	Description	Source
C-801b	Silty Sand	Hubbardston Sand

2. Sieve Analysis (% passing by weight)

Sieve Size	Result
3/4"	100
1/2	99
3/8	99
#4	98
10	95
20	88
40	74
50	63
80	40
200	11.9

3. Moisture Density Relation

Test	D698	D1557
Maximum Dry Unit Weight (p.c.f.)	114.0	116.2
Optimum Moisture (%)	10.7	9.3

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

TESTED FOR: Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

PROJECT: Industri-Plex Site
Woburn, MA

DATE: September 27, 1995

OUR REPORT NO.: 446-30047-542

TEST DATA

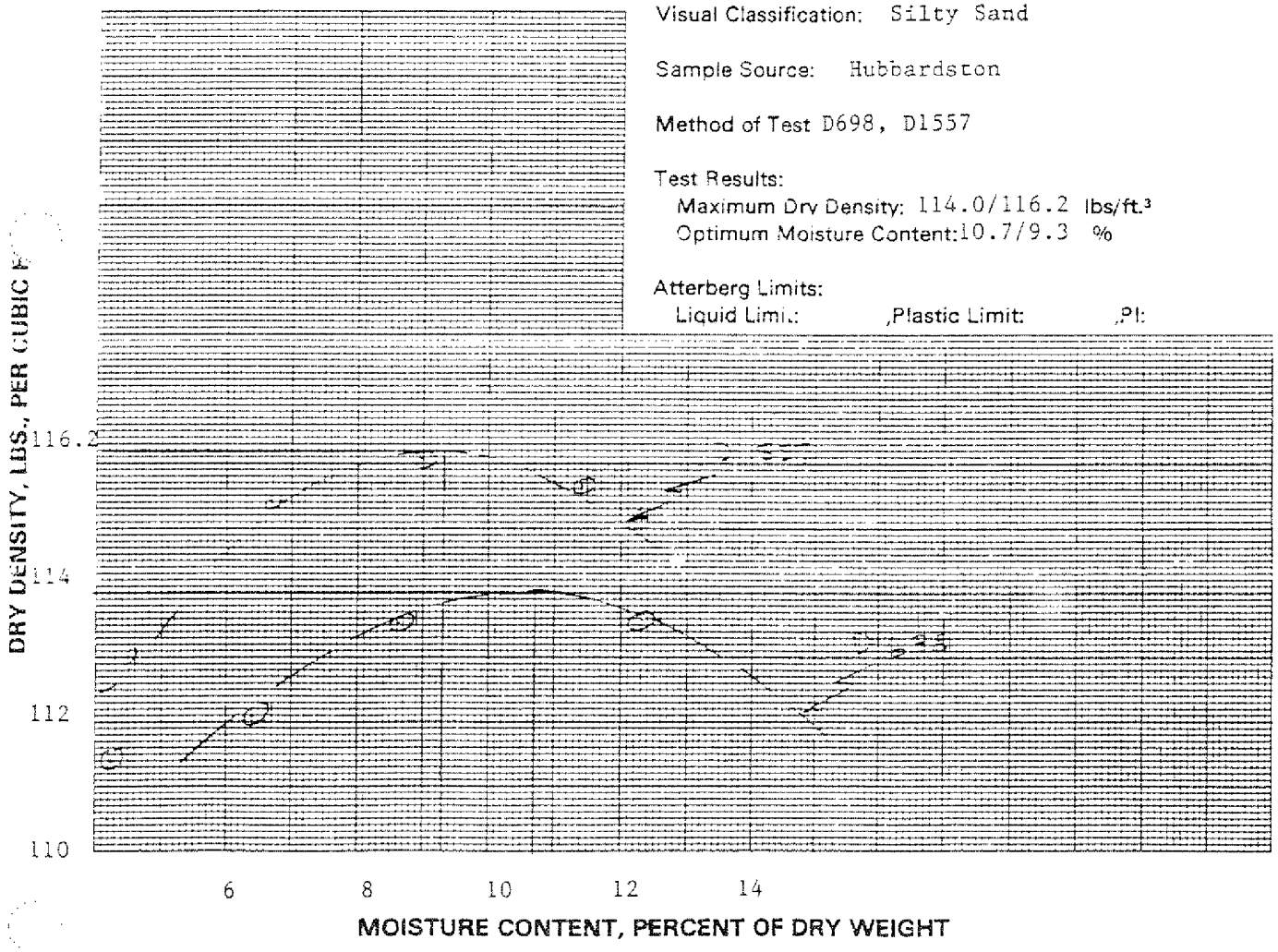
Visual Classification: Silty Sand

Sample Source: Hubbardston

Method of Test D698, D1557

Test Results:
Maximum Dry Density: 114.0/116.2 lbs/ft.³
Optimum Moisture Content: 10.7/9.3 %

Atterberg Limits:
Liquid Limit: ,Plastic Limit: ,PI:



Respectfully submitted,
Professional Service Industries, Inc.

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

PSI A-100-1

Professional Service Industries, Inc.

September 27, 1995 Report Number 446-30047-536

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of sample of soil as taken by this laboratory on 9/25/95.

1. Sample Description

Sample No.	Description	Source
C-801b	Silty Sand	Hubbardston Sand

2. Sieve Analysis (% passing by weight)

Sieve Size	Result
3/4"	100
1/2	99
3/8	99
#4	98
10	95
20	88
40	74
50	63
80	40
200	11.9

3. Moisture Density Relation (ASTM D698)

Test	Result
Maximum Dry Unit Weight (p.c.f.)	114.0
Optimum Moisture (%)	10.7

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

July 19, 1995

Report Number 446-30047-472

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site
Woburn, MA

Gentlemen:

The following are test results of samples of sand as taken by this laboratory on 7/10/95.

1. Sample Description

Sample Number	Description	Source
C-452a	Sand	Hubbardston, 1E
C-452b	Sandy Gravel	Hubbardston, 2S
C-452c	Silty Sand	Hubbardston, 3W
C-452d	Sand	Hubbardston, 4N

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	C-452a	C-452b	C-452c	C-452d
1 1/2"		100		
1		92		
3/4	100	92	100	100
1/2	99	90	99	99
3/8	99	89	99	98
#4	98	87	98	96
10	96	84	96	93
20	85	75	91	83
40	62	60	81	65
50	44	48	71	51
80	21	29	50	27
200	4.0	7.1	15.7	6.7

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

June 13, 1995 Report Number 446-30047-440

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of sample of soil as taken by this laboratory on 6/9/95.

1. Sample Description

Sample No.	Description	Source
C-356	Sand	Hubbardston

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result
1"	100
3/4	96
1/2	95
3/8	94
#4	94
10	92
20	84
40	64
50	47
80	22
200	4.0

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

APPENDIX F.2.2

Subangular Stone and Riprap Materials

APPENDIX F.2.2
SUMMARY OF GRAVEL/COBBLE AND RIPRAP LABORATORY TEST RESULTS

SITE SAMPLE NUMBER	DATE	SOURCE	GRADATION (% PASSING) ASTM D422												Porosity Test Results (ASTMC29,C127)			CARBONATE CONTENT (%) ASTM D4373	STONE BALLAST TEST RESULTS		
			9"	6"	4"	3"	2"	1"	3/4"	1/2"	3/8"	#4	#10	#50	Dry Rodded Unit Wt. (p.c.f)	Bulk Sp. Gravity (p.c.f)	Porosity (%)		ASTM C235	ASTM C117	ASTM C142
C-249C	5/21/93	P.J. Keating						100	98	41	9	3						3			
C-249D	5/21/93	P.J. Keating						100	97	58	38	8						4			
C-249E	5/21/93	P.J. Keating								100	92	15						4			
C-520B	8/17/93	P.J. Keating						100	96	55	38	8						1.1			
C-520C	8/17/93	P.J. Keating								100	93	11						2.9			
C-520D	8/17/93	P.J. Keating						100	96	32	7	2						1.9			
C-240A	5/25/94	Bardon Trimount						100	97	49	19	5									
C-231	5/31/94	Bardon Trimount						68	33	13	10										
C-261	5/31/94	Bardon Trimount						100	100	99	95	20									
C-387	6/28/94	ON-SITE													92.8	167.2	44.5				
C-663A	9/2/94	ON-SITE								100	87	12									
C-663B	9/2/94	ON-SITE								100	96	24									
C-663C	9/2/94	ON-SITE								100	96	24									
C-663D	9/2/94	ON-SITE							100	98	84	12									
C-663E	9/2/94	ON-SITE							100	99	94	20									
C-663F	9/2/94	ON-SITE								100	95	23									
C-137B	3/31/95	Bardon Trimount						100	98	49	24	7									
C-199B	4/24/95	P.J. Keating																	0	0.2	0
C-603A	8/10/95	Bardon Trimount				100	99	2	1												
C-603B	8/10/95	Bardon Trimount				100	50	2													
C-603C	8/10/95	Bardon Trimount	100	51	11	0															

Professional Service Industries, Inc.

July 10, 1993

Report Number 446-30268-3

Mr. Michael Lawrence
P.J. Keating Co.
One Reservior Road
Lunenburg, MA 01462

Re: Industri Plex Site

Gentlemen:

The following are test results of a sample of stone as delivered to this laboratory on 5/21/93:

1. Sample Description

Sample Number	Description	Source
C-249c	1" Stone	P.J. Keating

2. Gradation (ASTM D 422, % passing by weight)

Sieve Size	Result	Spec. (ASTM C 33, #57)
1 1/2"	100	100
1	100	95-100
3/4	98	-
1/2	41	25-60
3/8	9	-
#4	3	0-10
8	2	0-5

3. Carbonate Content (ASTM D 4373)

Result, %	Spec., %
3	5 max.

4. Permeability (USCOE EM 1102-2-1906)

Result
Greater than 2 cm/sec.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

B/mm

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

July 10, 1993

Report Number 446-30268-2

Mr. Michael Lawrence
P.J. Keating Co.
One Reservior Road
Lunenburg, MA 01462

Re: Industri Plex Site

Gentlemen:

The following are test results of a sample of stone as delivered to this laboratory on 5/21/93:

1. Sample Description

Sample Number	Description	Source
C-249d	3/4" Stone	P.J. Keating

2. Gradation (ASTM D 422, % passing by weight)

Sieve Size	Result	Spec. (ASTM C 33, #67)
1"	100	100
3/4	97	90-100
1/2	58	-
3/8	38	20-55
#4	8	0-10
8	3	0-5

3. Carbonate Content (ASTM D 4373)

Result, %	Spec., %
4	5 max.

4. Permeability (USCOE EM 1102-2-1906)

Result
2 cm/sec.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/mm

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

July 10, 1993

Report Number 446-30268-1

Mr. Michael Lawrence
P.J. Keating Co.
One Reservior Road
Lunenburg, MA 01462

Re: Industri Plex Site

Gentlemen:

The following are test results of a sample of stone as delivered to this laboratory on 5/21/93:

1. Sample Description

Sample Number	Description	Source
C-249e	3/8" Stone	P.J. Keating

2. Gradation (ASTM D 422, % passing by weight)

Sieve Size	Result	Spec. (Gas Collection Layer)
1/2"	100	100
3/8	92	85-100
#4	15	10-30
8	2	0-10
16	1	0-5

3. Carbonate Content (ASTM D 4363)

Result, %	Spec., %
4	5 max.

4. Permeability (USCOE EM 1110-2-1906)

Result
2 cm/sec.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/mm

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

September 8, 1993

Report No. 446-30047-37

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 8/17/93:

1. Sample Description

Sample Number	Description	Source
C-520b	Stream Bed Sediment Filter Stone	P.J. Keating

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (AASHTO #67)
1"	100	100
3/4	96	90-100
1/2	55	-
3/8	38	20-55
#4	8	0-10
8	2	0-5

3. Carbonate Content (ASTM D 3042)

Result (%)	Spec.
1.1	5% max.

Remarks: Sample conforms to specification requirements.

Sincerely,

Thomas Bowker

Thomas Bowker
Division Manager

TB/mm

Professional Service Industries, Inc.

September 8, 1993

Report No. 446-30047-38

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 8/17/93:

1. Sample Description

Sample Number	Description	Source
C-520c	Gas Collection Stone	P.J. Keating

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (AASHTO #8)
1/2"	100	100
3/8	93	85-100
#4	11	10-30
8	2	0-10
16	1	0-5

3. Carbonate Content (ASTM D 3042)

Result (%)	Spec.
2.9	5% max.

4. Permeability (USCOE EM 1110-2-1906)

Result
Greater than 2 cm/sec.

Sincerely,

Thomas Bowker
Division Manager

TB/mm

...pike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

September 8, 1993

Report No. 446-30047-39

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 8/17/93:

1. Sample Description

Sample Number	Description	Source
C-520d	Drainage Stone	P.J. Keating

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (AASHTO #57)
1 1/2"	100	100
1	100	95-100
3/4	96	-
1/2	32	25-60
3/8	7	-
#4	2	0-10
8	1	0-5

3. Carbonate Content (ASTM D 3042)

Result (%)	Spec.
1.9	5% max.

Remarks: Sample conforms to specification requirements.

Sincerely,

Thomas Bowker
Division Manager

TB/mm

Professional Service Industries, Inc.

June 7, 1994

Report No. 446-30047-158

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 5/25/94.

1. Sample Description

Sample Number	Description	Source
C-240a	1" Stone	Bardon Trimount

2. Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (No. 57)
1 1/2	100	100
1	100	95 - 100
3/4	97	
1/2	49	25 - 60
3/8	19	
#4	5	0 - 10
10	3	0 - 5

Remarks: Sample conforms to specification requirements.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

9 [illegible]rike Street, Suite H • C[illegible], MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

Resampled on
06/28/94 for
Void (%)

June 7, 1994

Repc

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re:

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 5/31/94.

1 Sample Description

Sample Number	Description	Source
-231	2" Stone	Bardon Trimount

2. Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (AASHTO M43, #3)
2 1/2"	100	100
2	97	90 - 100
1 1/2	90	35 - 70
1	68	0 - 15
3/4	33	
1/2	13	0 - 5
3/8	10	

marks: Sample does not conform to specifications.

ould you have any questions or require additional information, ease do not hesitate to call.

ncerely,

Bowker
n Manager

ke Street

Professional Service Industries, Inc.

Not resampled because it is not remedy Stone.

June 7, 1994

Rep

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re:

Gentlemen:

The following are test results of this laboratory on 5/31/94. [illegible] as taken by

1. Sample Description

Sample Number	Description	Source
C-261	3/4" Stone	Bardon Trimount

2. Sieve Analysis (% passing by weight

Sieve Size	Result	Spec. (No. 67)
1"	100	100
3/4	100	90 - 100
1/2	99	
3/8	95	20 - 55
#4	20	0 - 10
8	4	0 - 5

Remarks: Sample does not conform to specification requirements.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

July 7, 1994

Report Number 446-30047-196

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 6/28/94.

1. Sample Description

Sample No.	Description	Source
C-387	2" Stone	On Site

2. Porosity Test Results (ASTM C29, C127)

Test	Result
Dry Rodded Unit Wt. (p.c.f.)	92.8
Bulk Sp. Gravity (p.c.f.)	167.2
Porosity (%)	44.5

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

Professional Service Industries, Inc.

September 12, 1994

Report Number 446-30047-259

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of samples of stone as taken by this laboratory on 9/2/94.

1. Sample Description

Sample No.	Description	Source
C-663a	1/2" Stone	On Site
C-663b	1/2" Stone	On Site
C-663c	1/2" Stone	On Site
C-663d	1/2" Stone	On Site
C-663e	1/2" Stone	On Site
C-663f	1/2" Stone	On Site

2. Gradation (% passing by weight)

Sieve Size	C-663a	C-663b	C-663c	Spec. AASHTO M43, #8
1/2	100	100	100	100
3/8	87	96	96	85 - 100
#4	12	24	24	10 - 30
8	2	7	10	0 - 10
16	1	3	4	0 - 5

Sieve Size	C-663d	C-663e	C-663f	Spec. AASHTO M43, #8
3/4"	100	100		
1/2	98	99	100	100
3/8	84	94	95	85 - 100
#4	12	20	23	10 - 30
8	3	6	9	0 - 10
16	1	2	3	0 - 5

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Bill Lindsay
Staff Engineer

RECEIVED
SEP 15 1994

BL/jll

900 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

September 21, 1994

Report Number 446-30047-268

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 9/2/94.

1. Sample Description

Sample Number	Description	Source
C-663a	1/2" Stone	On Site

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (AASHTO #8)
1/2"	100	100
3/8	87	85 - 100
#4	12	10 - 30
8	2	0 - 10
16	1	0 - 5

3. Permeability (USCOE EM 1110-2-1906)

Result

Greater than 2 cm/sec.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

April 10, 1995

Report Number 446-30047-370

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site
Woburn, MA

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 3/31/95.

1. Sample Description

Sample Number	Description	Source
C-137b	3/4" Stone	Bardon Trimount

2. Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (ASTM C33, #57)
1 1/2"	100	100
1	100	95 - 100
3/4	98	-
1/2	49	25 - 60
3/8	24	-
#4	7	0 - 10
8	3	0 - 5

Remarks: Sample conforms to specification requirements.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

April 28, 1995

Report Number 446-30047-392

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a coarse aggregate as taken by this laboratory on 4/24/95.

1. Sample Description

Sample No.	Description	Source
C-199b	RR Ballast	P.J. Keating

2. Stone Ballast Test Results

Test	Result (%)	Spec.
Soft & Friable Particles (ASTM C235)	0.0	3.0 max.
Material Finer than #200 Sieve (ASTM C117)	0.2	0.5 max.
Clay Lumps (ASTM C142)	0.0	0.5 max.

Remarks: Sample conforms to project specification.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

August 16, 1995

Report Number 446-30047-498

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of sample of stone as taken by this laboratory on 8/10/95.

1. Sample Description

Sample No.	Description	Source
C-603a	2" Stone	Bardon Trimount

2. Sieve Analysis (% passing by weight)

Sieve Size	Result
3"	100
2	99
1 1/2	46
1	2
3/4	1

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

August 16, 1995

Report Number 446-30047-499

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of sample of stone as taken by this laboratory on 8/10/95.

1. Sample Description

Sample No.	Description	Source
C-603b	2" - 4" Stone	Bardon Trimount

2. Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec.
3"	100	100
2	50	50
1 1/2	7	
1	2	

Remarks: Sample conforms to specification requirements.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

August 16, 1995

Report Number 446-30047-500

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of sample of stone as taken by this laboratory on 8/10/95.

1. Sample Description

Sample No.	Description	Source
C-603c	6" RIP RAP	Bardon Trimount

2. Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec.
9"	100	100
6	51	50
4	11	
3	0	

Remarks: Sample conforms to specification requirements.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

January 15, 1993 Report No. 446-30047-1

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Aggregate Test Results

Gentlemen:

The following are test results of a sample of aggregate as delivered to this laboratory on 1/11/93:

1. Sample Description

Sample Number	Description	Source
C-10	1 1/2" Crushed Aggregate Base	Swampscott M 201.7

2. Abrasion Test Results (ASTM C 131)

Grading A

Initial Weight (g)	5000
Final Weight (g)	4116
Weight Loss (g)	884
Abrasion	18

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Laboratory Manager

TB/mm

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

July 7, 1994 Report Number 446-30047-196

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 6/28/94.

1. Sample Description

Sample No.	Description	Source
C-387	2" Stone	On Site

2. Porosity Test Results (ASTM C29, C127)

Test	Result
Dry Rodded Unit Wt. (p.c.f.)	92.8
Bulk Sp. Gravity (p.c.f.)	167.2
Porosity (%)	44.5

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

Professional Service Industries, Inc.

September 12, 1994 Report Number 446-30047-259

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of samples of stone as taken by this laboratory on 9/2/94.

1. Sample Description

Sample No.	Description	Source
C-663a	1/2" Stone	On Site
C-663b	1/2" Stone	On Site
C-663c	1/2" Stone	On Site
C-663d	1/2" Stone	On Site
C-663e	1/2" Stone	On Site
C-663f	1/2" Stone	On Site

2. Gradation (% passing by weight)

Sieve Size	C-663a	C-663b	C-663c	Spec. AASHTO M43, #8
1/2	100	100	100	100
3/8	87	96	96	85 - 100
#4	12	24	24	10 - 30
8	2	7	10	0 - 10
16	1	3	4	0 - 5

Sieve Size	C-663d	C-663e	C-663f	Spec. AASHTO M43, #8
3/4"	100	100		
1/2	98	99	100	100
3/8	84	94	95	85 - 100
#4	12	20	23	10 - 30
8	3	6	9	0 - 10
16	1	2	3	0 - 5

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Bill Lindsay
Staff Engineer

RECEIVED SEP 15 1994

BL/jll

[illegible] Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

September 21, 1994 Report Number 446-30047-268

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 9/2/94.

1. Sample Description

Sample Number	Description	Source
C-663a	1/2" Stone	On Site

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (AASHTO #8)
1/2"	100	100
3/8	87	85 - 100
#4	12	10 - 30
8	2	0 - 10
16	1	0 - 5

3. Permeability (USCOE EM 1110-2-1906)

Result
Greater than 2 cm/sec.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

90 [illegible] Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

NOT resampled because it is not remedy Stone.

June 7, 1994 Rep

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801 Re:

Gentlemen:

The following are test results of [illegible] as taken by this laboratory on 5/31/94.

1. Sample Description

Sample Number	Description	Source
C-261	3/4" Stone	Bardon Trimount

2. Sieve Analysis (% passing by weight

Sieve Size	Result	Spec. (No. 67)
1"	100	100
3/4	100	90 - 100
1/2	99	
3/8	95	20 - 55
#4	20	0 - 10
8	4	0 - 5

Remarks: Sample does not conform to specification requirements.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

June 7, 1994 Report No. 446-30047-158

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 5/25/94.

1. Sample Description

Sample Number	Description	Source
C-240a	1" Stone	Bardon Trimount

2. Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (No. 57)
1 1/2	100	100
1	100	95 - 100
3/4	97	
1/2	49	25 - 60
3/8	19	
#4	5	0 - 10
10	3	0 - 5

Remarks: Sample conforms to specification requirements.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

[illegible] Street, Suite H • [illegible] MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

Professional Service Industries, Inc.

Resampled on 06/28/94 for Voids (%)

June 7, 1994

Repc

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re:

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 5/31/94.

1. Sample Description

Sample Number	Description	Source
C-231	2" Stone	Bardon Trimount

2. Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (AASHTO M43, #3)
2 1/2"	100	100
2	97	90 - 100
1 1/2	90	35 - 70
1	68	0 - 15
3/4	33	
1/2	13	0 - 5
3/8	10	

Remarks: Sample does not conform to specifications.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

Professional Service Industries, Inc.

September 8, 1993

Report No. 446-30047-39

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 8/17/93:

1. Sample Description

Sample Number	Description	Source
C-520d	Drainage Stone	P.J. Keating

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (AASHTO #57)
1 1/2"	100	100
1	100	95-100
3/4	96	-
1/2	32	25-60
3/8	7	-
#4	2	0-10
8	1	0-5

3. Carbonate Content (ASTM D 3042)

Result (%)	Spec.
1.9	5% max.

Remarks: Sample conforms to specification requirements.

Sincerely,

Thomas Bowker
Division Manager

TB/mm

Professional Service Industries, Inc.

September 8, 1993

Report No. 446-30047-38

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 8/17/93:

1. Sample Description

Sample Number	Description	Source
C-520c	Gas Collection Stone	P.J. Keating

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (AASHTO #8)
1/2"	100	100
3/8	93	85-100
#4	11	10-30
8	2	0-10
16	1	0-5

3. Carbonate Content (ASTM D 3042)

Result (%)	Spec.
2.9	5% max.

4. Permeability (USCOE EM 1110-2-1906)

Result
Greater than 2 cm/sec.

Sincerely,

Thomas Bowker
Division Manager

TB/mm

Professional Service Industries, Inc.

September 8, 1993

Report No. 446-30047-37

Mr. Dale Kling
Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of a sample of stone as taken by this laboratory on 8/17/93:

1. Sample Description

Sample Number	Description	Source
C-520b	Stream Bed Sediment Filter Stone	P.J. Keating

2. Washed Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec. (AASHTO #67)
1"	100	100
3/4	96	90-100
1/2	55	-
3/8	38	20-55
#4	8	0-10
8	2	0-5

3. Carbonate Content (ASTM D 3042)

Result (%)	Spec.
1.1	5% max.

Remarks: Sample conforms to specification requirements.

Sincerely,

Thomas Bowker
Division Manager

TB/mm

Professional Service Industries, Inc.

August 16, 1995

Report Number 446-30047-499

Mr. Dale Kling
Industri-Plex Site
Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801

Re: Industri-Plex Site

Gentlemen:

The following are test results of sample of stone as taken by this laboratory on 8/10/95.

1. Sample Description

Sample No.	Description	Source
C-603b	2" - 4" Stone	Bardon Trimount

2. Sieve Analysis (% passing by weight)

Sieve Size	Result	Spec.
3"	100	100
2	50	50
1 1/2	7	
1	2	

Remarks: Sample conforms to specification requirements.

Should you have any questions or require additional information, please do not hesitate to call.

Sincerely,

Thomas Bowker
Division Manager

TB/jll

905 Turnpike Street, Suite H • Canton, MA 02021 • Phone: 617/821-2355 • Fax: 617/821-6276

NATHAN WISEBLOOD, P.E.
Consulting Engineer
26 PRISCILLA ROAD
HOPKINTON, MA 01748
TEL. (617) 435-4877

Report #72895
August 3, 1995

BARDON TRIMOUNT, INC
1831 BROADWAY
SAUGUS, MA 01906

Attn: Mr. Ron Tardiff

REPORT

Re: Accellerated Soundness of the Saugus Quary Ledge Stone by Freezing & Thawing, 12 Cycles-AASHTO.T103

PROCEDURES:

A. 29 pieces of ledge stone, 2 1/4" to 1 1/2", were sampled, 7/28, placed in two tared glass baking dishes - 8x10x2 1/2" - heated to K weight in Microwave oven, inundated in Hot Water for 17 1/2 hours.

B. The baking dishes were placed in a frezer at a K temperature of -40 F for a minimum of 2 hours.

C. The stone pieces were immersed in hot water and thawed out for a minimum of 2 hours and the process was repeated for 12 cycles.

D. The glass dishes and stone were then dried to K weight in the Microwave and carefully examined for broken pieces.

Dry Weight before immersing in Water	5096.3
Dry Weight after 12 Cycles	5042.1
Loss	54.2
% Loss, Pass. ~~1 1~~/4"	1.07
% Pieces broken in 2 fragments	0.0
% Pieces broken in 3 or more fragments	0.0

Respectfully Submitted,

Nathan Wiseblood, P.E.

COMMONWEALTH OF MASSACHUSETTS
NATHAN WISEBLOOD
No. 7013
REGISTERED PROFESSIONAL ENGINEER

July 28, 1995
Report #72895

BARDON TRIMOUNT, INC - SAUGUS LEDGE STONE

7/28	Microwave Oven Dry Wgt. 29 Pieces	5096.3
8/3	Microwave Oven Dry Wgt. 29 Pieces	5042.2

DATES	TIME IN HOT WATER	TIME IN FREEZER=KT -40 F
1. 7/28/29	2:00 PM - 7:30 AM	7:30 AM to 10:30 AM
2. 7/29	10:30 AM - 12:30 PM	12:30 PM to 3:00 PM
3. 7/29	3:00 PM - 5:00 PM	5:00 PM to 7:00 PM
4. 7/29/30	7:00 PM - 9:00 PM	9:00 PM to 7:30 AM
5. 7/30	7:30 AM - 9:30 AM	9:30 AM to 6:00 PM
6. 7/31 & 8/1	6:00 PM - 8:00 PM	8:00 PM to 9:30 AM
7. 8/1	7:30 AM - 9:30 AM	9:30 AM to 12:00 Noon
8. 8/1	12:00 Noon - 2:00 PM	2:00 PM to 4:15 PM
9. 8/1/2	4:15 PM - 6:30 PM	6:30 PM to 7:00 AM
10. 8/2	7:00 AM - 9:00 PM	9:00 PM to 11:00 AM
11. 8/2	11:00 AM - 1:00 PM	1:00 PM to 3:00 PM
12. 8/2	3:00 PM - 4:30 PM	4:30 PM to 6:30 PM

LOSS = 54.2

% LOSS = 1.07

No. of Fragment 2 or more = 0 Pass 1 1/4"

* NOTE: Clean-Hard-Loss - Small particles Pass. #4

Bardon Trimount, Inc.
70 Blanchard Road
P.O. Box 09
Burlington
Massachusetts
01803 - 0039

Tel: 617 - 221 - 8400
Fax: 617 - 221 - 8452

Operating as:

Lynn Sand & Stone Company

McNamara Concrete

Bardon Trimount

April 3, 1995

Aggregate Qualifications

Coarse Aggregate

Test:	result:	
Los Angeles Abrasion, %loss	17.4	ASTM C-535,1000 revolutions
Sodium Sulfate Soundness, %loss	1.29	ASTM c-88, 5 cycles
Two Fractured Faces, %	100	
One Fractured Face, %	100	
Flat pieces, %	6.6	ASTM D-4791
Elongated pieces, %	0.0	ASTM D-4791
Specific Gravity,	2.77	ASTM C-127

Fine Aggregate

Plastic Index		Non Plastic	ASTM D-4318
Liquid Limit		Non Plastic	ASTM D-4318
Absorbtion, %		0.4%	AS TM C-128
gradation:	3/8"	99 %passing	ASTM C-136
	#8	75	
	#50	22	
	#200	5	

All aggregates consist of clean, sound, durable, angular particles produced by crushing stone and are free from coatings of clay, silt, or other objectionable matter and contain no clay balls.

ASTM D2419 Sand Equivalent, 8-10-95, SE= 84

Respectfully submitted,

Ron Yardley, Manager
Materials & Research

8/10/95

Bardon Trimount, Inc.
70 Blanchard Road
P. O. Box 39
Burlington
Massachusetts
01803-0039

Tel: 617-221-8400
Fax: 617-221-8452

Operating as:

Lynn Sand & Stone Company

McNamara Concrete

Bardon Trimount

02271-1A

July 8, 1996

SUBMITTAL REVIEW
☑ No Exceptions Taken
☐ Make Corrections Noted
☐ Revise - Resubmit
☐ Reject - Resubmit
Review Completion Date 7/11/96
PCN

Mr. Barry Goldstein
I.R.S Enviro-Services, Inc.
400 Lafayette Road
Hampton, NH 03842-2209

Dear Barry:

The following test report for abrasion tests, freeze/thawing tests and specific gravity are representative of all Stone Rip-Rap (Gravel/Cobble). This would include any stone of a diameter of 3" or greater (i.e. 3", 6" and 12").

Aggregate Qualifications

Swampscott/Saugus/Peabody crushed stone

Soundness MgS04-ASTMC88 5 cycles	Swampscott Saugus Peabody	% loss = 0.5 % loss = 0.5 % loss = 1.4
L.A. Abrasion ASTM C535 Gr.2/1000 rev.	Swampscott Saugus Peabody	% loss = 17 % loss = 18 % loss = 17
Specific Gravity ASTM C127-88	Swampscott Bulk SSD Saugus Bulk SSD Peabody Bulk SSD	= 2.94 = 2.78 = 2.84

Rip Rap will be graded such that 50 percent (50%) of the mixture by weight will be larger than the d50 size. The diameter of the largest stone size in the mixture will be 1.5 times the d50.

All aggregates consist of clean, sound, durable, angular particles produced by crushing stone and are free from coatings of clay, silt or other objectionable matter and contain no clay balls.

Very truly yours,

Lou Iuliano
Sales Manager

APPENDIX F.2.3

Topsoil

BAKER SOIL TEST SUMMARY

	LOCATION	SAMPLE SENT	REPORT - Baker	COST
1.	New Boston St. (219)	6/9/94	6/21/94	$70
2.	#1 - EAST SIDE OF WHP #2 - NE SIDE OF WHP	10/12/94	10/25/94	$200
3.	#1 S SIDE OF EHP #2 W SIDE OF EHP	12/21/94	~~11/1/94~~ 1/11/95	$200
4.	Littleton Topsoil	3/24/95	4/13/95	$80
5.	Pepperell Topsoil	4/7/95	4/27/95	$160
6.	Reading, Manchester, New Boston Topsoils	4/19/95	4/28/95	$240
7.	Hudson Topsoil	5/15/95	5/25/95	$70
8.	Tewksbury, MA Topsoil	7/11/95	7/21/95	$70
9.	Bedford, NH Topsoil	—	—	—
10.	Nashua Blend	10/30/95	11/6/95	$70
11.	Saugus, MA Topsoil	11/9/95	11/29/95	$70
12.	Bradford, MA Topsoil	5/23/95		

INTERPRETING SOIL TESTS FOR TURFGRASS ESTABLISHMENT ST6

10/87

A step-by-step explanation of the test report from the Soil Testing Laboratory.

DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL
10/09/87	9601	000000	OUT OF STATE			TURF ESTAB

THE PENNSYLVANIA STATE UNIVERSITY
COLLEGE OF AGRICULTURE
MERKLE LABORATORY - SOIL TESTING
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

P A DOE
MAIN ST
ANYTOWN PA 00000

COPY SENT TO:

ACME FERTILIZER
R D 1
ANYTOWN PA 00000

SOIL NUTRIENT LEVELS

		LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH		XXXXXXXXXXXX			
Phosphate	(P_2O_5)	XXX			
Potash	(K_2O)	XXXXXXXX			
Magnesium	(MgO)	XXXXXXXXXXX			
Calcium	(Ca)	XXSOIL 31 - TURF ESTAB

RECOMMENDATIONS FOR: HOME LAWN - TO PLANT (KENTUCKY BLUEGRASSES)

See Back For Comments

LIMESTONE: 50 LBS PER 1000 SQ. FT — 1

ORGANIC MATTER: 2.0 CU. YDS. PER 1000 SQ. FT — 2,3

APPLY THE FOLLOWING FERTILIZER NUTRIENTS AS INDICATED - AMOUNTS ARE IN LBS/1000 SQ FT

		NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	
BASIC FERTILIZER		NONE	11.0	6.0	3,4
PLUS STARTER FERTILIZER	QUICKLY AVAILABLE NITROGEN	1.5			5,6
	OR		1.5	1.5	
	SLOWLY AVAILABLE NITROGEN	3.0			

MESSAGES:

CONTACT YOUR COUNTY AGENT IF YOU NEED ASSISTANCE IN INTERPRETING THIS RECOMMENDATION.

LABORATORY RESULTS

SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
6.5	14	2.0	0.11	0.8	8.0	10.9	1.0	7.4	73.3
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:
ORGANIC MATTER - 2.3 %

The Pennsylvania State University
College of Agriculture

The soil test report is divided into four parts: (1) Sample information, (2) Interpretation of the laboratory results, (3) Recommendations, and (4) Laboratory data.

SAMPLE INFORMATION:
The top of the report provides information on identification of the sample (county and area identification) and laboratory identification of the sample (Date, Laboratory number, and Serial number). If there is a problem or question regarding the report, the laboratory identification is important. If you need to contact the laboratory they will require the date and laboratory number of your sample. Prompt action is important as soil samples are held for a limited time after analysis.

Below the sample information your name and address appears along with the name and address of a second party or company who will receive a copy of the report if you so requested.

INTERPRETATION OF THE RESULTS:
The results of the laboratory analysis must be interpreted by relating the laboratory results to known turfgrass response. The soil nutrient levels and the pH of the soil are interpreted on the basis of turfgrass research and given as a bar graph which indicates whether the pH and nutrient levels are low, optimum, high or excessive.

A LOW soil test level indicates that the nutrient is deficient and may limit turfgrass response. There is a high probability of improved turfgrass response from correcting a low nutrient level or a low pH.

An OPTIMUM soil test level indicates that the nutrient is adequate and probably will not limit turfgrass response during a normal growing season.

A HIGH soil test level indicates that the nutrient is more than adequate and will not limit turfgrass response. There is a very low probability of improved turfgrass response from the application of a nutrient present at a high test level.

An EXCESSIVE soil test level indicates that the nutrient is excessive for good turfgrass growth and may cause a nutrient imbalance in the soil and/or in the plant. Additional applications of a fertilizer nutrient to soils having an excessive level of that nutrient may adversely affect plant growth and environmental quality.

RECOMMENDATIONS:
Limestone: Limestone is applied to neutralize soil acidity and raise the soil pH to approximately 6.8 to 7.0. The limestone recommendation is based on the amount of exchangeable acidity measured by the SMP lime requirement test. High quality ground agricultural limestone is the recommended liming material. Limestone recommendations are given in pounds per 1000 square feet or per acre.

Nitrogen: Nitrogen, which is essential for vegetative growth and good green color is a constituent of plant proteins, chlorophyll, amino acids and other plant substances. Currently, there is no acceptable soil test for nitrogen as soil nitrogen varies with temperature and moisture conditions on a day to day basis. Nitrogen recommendations are given in pounds of nitrogen per 1000 square feet or per acre. The recommended rates are based on the turfgrass species and/or variety and the use of the turfgrass area.

Phosphorus: Phosphorus is necessary for good root development and is important in many vital growth processes. The recommended phosphate application rate is based on the amount of available soil phosphorus determined by the laboratory test. Recommendations are given in pounds per 1000 square feet or per acre of phosphate (P_2O_5).

Potassium: Potassium is required for physiological functions of the plant and promotes disease resistance and winter hardiness in grasses. Recommended potash (K_2O) application rates are calculated from the potassium (K) percent saturation determined by the laboratory test. Potash recommendations are given in pounds per 1000 square feet or per acre.

Magnesium: When magnesium levels are low and liming to raise pH is recommended, dolomitic limestone should be applied instead of standard ground agricultural limestone.

Basic Fertilizer: The basic fertilizer (phosphate and/or potas must be worked thoroughly throughout the top four to six inches of soil. Once turf is established there is no opportunity to work these materials throughout the soil profile.

Starter Fertilizer: The starter fertilizer (nitrogen, phosphate and potash) is applied to the soil surface just prior to seeding and provides nutrients to the developing seedlings. The recommendations give you the option of using a quickly available or a slowly available source of nitrogen.

COMMENTS:
To the right of the recommendations there is a column labelled "See Back For Comments". These comments, indicated by number, are found on the back of the report and provide additional information on organic matter, fertilizer, and establishment procedures.

LABORATORY DATA:
Soil pH: Soil pH indicates whether the soil is acid or alkaline. Most turfgrass species and varieties grow best at a pH of 6.5 to 7.0. Different soils can have the same pH but differ in buffer capacity. Thus, soils with the same pH may need different amounts of limestone to adjust soil acidity to the desired level.

Acidity: The lime requirement is calculated from the acidity as follows: Lime requirement = Acidity X 1000. This is the number of pounds of limestone needed per acre to raise the pH to approximately 7.0 in a four to six inch soil depth. To convert to pounds per 1000 square feet divide pounds per acre by 44 and round off to the nearest five pounds.

Phosphorus: Pounds per acre of available phosphorus (P) present in the soil is reported. Phosphate applications on some turfgrass species, especially Kentucky bluegrass, may be helpful even when available phosphorus is in the optimum range.

Critical soil phosphorus levels for turfgrass are:

P lb. per acre	Soil Level
0-60	Low
61-100	Optimum
101-210	High
>210	Excessive

Cation Exchange Capacity (CEC): The CEC is the measurement of the soil's chemical storehouse. Storage capacity of Pennsylvania soils is essentially saturated with hydrogen (H) (acidity), calcium (Ca), magnesium (Mg), and potassium (K). CEC is calculated as:

CEC = Milli-equivalents per 100 grams of soil of hydrogen (acidity) plus calcium plus magnesium plus potassium

CEC = 2.0 + 0.11 + 0.8 + 8.0 = 10.9 (to the nearest tenth)

Heavy clay soils, high in organic matter have high CEC values. Sandy soils have low CEC values.

Saturation: The percent saturation is the concentration of each element expressed as the percent of the CEC. A balanced soil will generally fall within these ranges:

K - 2 to 5%
Mg - 5 to 15%
Ca - 60 to 80%

In some soils, K is often greater than 5% of CEC. Such high values are usually considered undesirable, particularly when not in good balance with other nutrients. At excessive K levels, plants tend to take up large quantities of K at the expense of Ca or Mg.

A wide range of Ca is permissible. Excessive Ca saturation indicates that most of the soil's chemical "storehouse" is occupied with Ca leaving less room for K and Mg.

Normally a 10% Mg saturation is desired. The ratio of exchangeable Mg to K is equally important. Mg application is recommended when percent saturation is less than 5% or when the Mg to K ratio is less than two to one. Ca to Mg ratio should be about six to one. When greater than ten to one, the soil is out of balance.

ADDITIONAL COMMENTS:

Spring seeded areas should receive a maintenance application of a complete fertilizer (nitrogen, phosphate, potash) in the fall of the seeding year. For future maintenance a new soil test for maintenance should be made during the first full year of maintenance.

A soil test is not the answer to all turfgrass problems. When soil fertil- s in good balance, consider other factors responsible for, or associated with, poor growth. Among numerous causes for poor growth are unfavorable physical soil conditions (poor drainage, compaction, poor aeration, low water-holding capacity, low organic matter content), weather unsuited to turfgrass, injury due to improper use of fertilizers or pesticides, and attacks of insects or diseases. Adoption of the best management practices are important for successful growing of all turfgrasses.

SOIL TEST RECOMMENDATION CALCULATIONS:

Fertilizer recommendations are given in pounds of nitrogen (N), phosphate (P_2O_5) and potash (K_2O) per 1000 square feet of area. There are many different turfgrass fertilizer grades on the market and the availability of these fertilizer grades varies across the Commonwealth. If, for example, you were given a recommendation to apply X pounds of a 10-6-4 fertilizer you may find it unavailable in your area and yet it may be readily available in other parts of the state. It is also unfair to the commercial suppliers in that it is impossible to give recommendations in terms of all available turfgrass fertilizer grades.

The determination of which fertilizer grade to use and the amount of the chosen grade to apply to meet the soil test requirements is not as difficult as it may appear. The following steps will help make the proper choice of material and application rate.

1. Determine the ratio of the nutrients as recommended in the soil test report. Ratio simply indicates the relationship between the amounts of nitrogen, phosphate, and potash. If, for example, your soil test report calls for 1.5 pounds of nitrogen, 0.5 pounds of phosphate, and 0.5 pounds of potash per 1000 square feet the ratio would be 3-1-1. There is three times as much nitrogen as there is phosphate and three times as much nitrogen as potash. The simplest method to determine a ratio is to divide the amounts of nitrogen, phosphate, and potash by the lowest figure of the three. Thus 1.5 pounds of nitrogen, 0.5 pounds of phosphate, and 0.5 pounds of potash would have a:

$$\frac{1.5}{0.5}\ \frac{0.5}{0.5}\ \frac{0.5}{0.5} \quad \text{or 3-1-1 ratio}$$

2. Visit fertilizer suppliers and see what fertilizer grades are available and determine the ratio of these grades. If a grade such as: 21-7-7, 18-6-6, 24-8-8 is available a quick calculation shows all three have a 3-1-1 ratio, i.e.,

$$\frac{21}{7}\ \frac{7}{7}\ \frac{7}{7} = 3\text{-}1\text{-}1 \qquad \frac{18}{6}\ \frac{6}{6}\ \frac{6}{6} = 3\text{-}1\text{-}1$$

$$\frac{24}{8}\ \frac{8}{8}\ \frac{8}{8} = 3\text{-}1\text{-}1$$

It is important to know that the recommendations given in the soil test report are guidelines, not absolute quantities. Many times you will not be able to obtain a fertilizer grade that exactly fits the recommended ratio. Therefore, use the fertilizer grade that best fits the recommended ratio. Again using a 3-1-1 ratio as an example you may not be able to obtain a grade having a perfect 3-1-1 ratio but you might be able to obtain a 22-6-8 grade (3.6-1-1.3 ratio) or a 18-5-9 grade (3.6-1-1.8 ratio) or similar. These or similar grades would be satisfactory.

3. After selecting the fertilizer grade that most closely fits the recommended soil test ratio you must determine how much of the selected fertilizer is needed per 1000 square feet of area to satisfy

the soil test recommendation. Use the following formula to determine the amount of the selected fertilizer to apply.

$$\frac{\text{Nitrogen recom. per 1000 sq.ft.}}{\text{\% Nitrogen in the selected fertilizer}} \times 100 = \text{pounds of selected fertilizer required per 1000 square feet}$$

Example:

a. The soil test calls for 1.5 pounds of N, 0.5 pounds of P_2O_5 and 0.5 pounds of K_2O per 1000 square feet (3-1-1 ratio).

b. The fertilizer closest to a 3-1-1 ratio that is available is a 20-6-8 grade fertilizer (3.3-1-1.3 ratio).

Using the above formula:

$$\frac{1.5}{20} \times 100 = 7.5 \text{ pounds of fertilizer per 1000 square feet}$$

Thus, 7.5 pounds per 1000 square feet of a 20-6-8 grade fertilizer would approximate the soil test requirements.

Check your calculations as follows:

$$\text{Nitrogen: Pounds of fertilizer} \times \frac{\text{\% N in fertilizer}}{100} = 7.5 \times \frac{20}{100} = 1.5 \text{ lbs. N}$$

$$\text{Phosphate: Pounds of fertilizer} \times \frac{\text{\% } P_2O_5 \text{ in fertilizer}}{100} = 7.5 \times \frac{6}{100} = 0.45 \text{ lbs. of } P_2O_5$$

$$\text{Potash: Pounds of fertilizer} \times \frac{\text{\% } K_2O \text{ in fertilizer}}{100} = 7.5 \times \frac{8}{100} = 0.6 \text{ lbs of } K_2O$$

These amounts are very close to the soil test recommendations.

4. The soil test report also may recommend that 30% or more of the total nitrogen be water insoluble nitrogen (WIN) or controlled release nitrogen (CRN). The fertilizer grade label will indicate the percent total nitrogen and the percent WIN or CRN in the fertilizer. The grade label will not indicate the percentage of the total nitrogen that is WIN or CRN. This can be calculated from the grade label:

$$\frac{\text{\% WIN or CRN on label}}{\text{\% Total N on label}} \times 100 = \text{Percent of the total nitrogen that is WIN or CRN}$$

Assume label states: 20-6-8

Total Nitrogen (8% WIN)	20%
Available phosphate	6%
Water soluble potash	8%

Therefore: $\frac{8}{20} \times 100 = 40\%$ of the total N is WIN

5. In some cases, usually due to low soil levels of phosphate and/or potash, it may be impossible to obtain a fertilizer grade that even approaches the desired ratio. This can best be solved by making an application of a complete fertilizer (N, P_2O_5, K_2O) followed by a second application of a phosphate and/or potash (no nitrogen) fertilizer. To calculate the additional fertilizer required subtract the amount of P_2O_5 and/or K_2O applied in the complete fertilizer (the amounts determined by the calculation checks in number 3 above) from the amount of each of these recommended by the soil test. Then use the same formula as was used before with nitrogen only substituting phosphate or potash, e.g., for phosphate:

$$\frac{\text{Amount of additional } P_2O_5 \text{ rec.}}{\text{\% } P_2O_5 \text{ in the fertilizer selected}} \times 100 = \text{pounds of selected fertilizer required per 1000 square feet}$$

If additional potash is required use the same formula with the additional potash required.

It is also valid where very small or very large applications of phosphate and/or potash are required to apply a nitrogen only application plus a phosphate and/or potash application. Calculations are made as before.

Prepared by:
John C. Harper II - Extension Agronomist
Douglas B. Beegle - Extension Agronomist

06/04/96	8295	016496	OUT OF STATE	00	BRADFD	TURF ESTAB
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

GOLDER ASSOC.
JUN 13 1996
MANCHESTER, NH

SOIL TEST REPORT FOR

P NEUMAN/GOLDER ASSC
400 COMMERCIAL ST
MANCHESTER NH 03101

COPY SENT TO:

DALE E BAKER/LMD
3048 RESEARCH DR
STATE COLLEGE PA 16801

SOIL NUTRIENT LEVELS:

			LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH			X			
Phosphate	(P_2O_5)	lb/A	XXXXXXXXXXXXXXXXXXXX			
Potash	(K_2O)	lb/A	XXXXXXXXXXX			
Magnesium	(MgO)	lb/A	XXXXX			
Calcium	(Ca)	lb/A	X			

RECOMMENDATIONS FOR: *PARK AREA - TO PLANT (KY. BLUE OR RYEGRASS)*

See Back For Comments

LIMESTONE: *7800* LBS PER ACRE — 1,3

ORGANIC MATTER: *NONE* CU. YDS. PER ACRE

APPLY THE FOLLOWING FERTILIZER NUTRIENTS AS INDICATED - AMOUNTS ARE IN LBS/ACRE

		NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	
BASIC FERTILIZER		*NONE*	*80*	*240*	3,4
PLUS STARTER FERTILIZER	QUICKLY AVAILABLE NITROGEN	*60*			
	OR		*30*	*30*	5,6
	SLOWLY AVAILABLE NITROGEN	*120*			

MESSAGES:

CONTACT YOUR COUNTY AGENT IF YOU NEED ASSISTANCE IN INTERPRETING THIS RECOMMENDATION.

LABORATORY RESULTS:

5.3	109	7.8	0.14	0.3	1.0	9.2	1.5	3.2	10.8
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

ORGANIC MATTER - 3.6 %

Golder Associates Inc.

400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To: LAND MANAGEMENT DECISIONS
BAKER SOIL TEST
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

ATTN: DR. SENFT

Date: May 23, 1996
Project No.: 933-6142.960

Sent by:

__Mail

__Courier

__Hand Carried

__Under Separate Cover

X Federal Express

__Enclosed

Qty	Item	Description
1	Soil Sample	Topsoil, Bradford, MA SEND INVOICE TO Mr. John Fiore, Proj. Mgr. ISRT 41 Atlantic Ave. Woburn, MA 01801

Remarks: Run 1 Baker Soil Test only.
Crop is turf - no fertilizer has been added. If you have any questions call (617) 932-9599 or the number above.

Per Peter Neumann
Resident Engineer

GOLDER ASSOC INC
ATTN PETER NEUMANN
ATLANTIC AVE
BURN PA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

TM

LMD INTERPRETATION OF BAKER SOIL TEST (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
L9770-1	11-30-1995	3070			5.10	5.30	5.00	12.30	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC (PPB)	97.17	**********		
Mehlich 3 P (PPM)	74.00	**********		
POTASSIUM:				
BST pK	3.65	**********		
BST K (PPM)	10.00	**********		
Exchangeable (ppm)	42.90	***		
Percent Of CEC	0.89	**********		
MAGNESIUM:				
BST pMg	3.33	**********		
BST Mg (PPM)	20.00	**********		
Exchangeable (PPM)	24.00	*		
Percent of CEC	1.63	*		
CALCIUM:				
BST pCa	2.68	**********		
BST Ca (PPM)	150.00	**********		
Exchangeable (PPM)	360.00	*		
Percent of CEC	14.63	*		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/H	3.70	*		
Mg/K	1.99	**********		
Ca/Mg	0.64	**********		
BAKER SOIL TEST (BST) MANGANESE:		LOW	NORMAL	
BST pMn	7.75			
BST Mn (PPM)	3.40	****		
BST pFe	18.87	**********		
BAKER SOIL TEST IRON:				
BST Fe (PPM)	44.00	**********		
BAKER SOIL TEST COPPER:				
BST pCu	13.87	**********		
BST Cu (PPM)	2.20	**********		
BAKER SOIL TEST ZINC:				
BST pZn	10.63	**********		
Zn (PPM)	13.00	**********		
		LOW	NORMAL	HIGH

GOLDER ASSOC INC FILE L9770-1

```
                                |----------LOW----------|--------------------NORMAL--------------------|----------HIGH----------|
    ESSENTIAL ELEMENTS          |                       |                                            |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR SODIUM:    |                       |                                            |                        |
   Na (PPM)            21.00    **********              |                                            |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR ALUMINUM:  |                       |                                            |                        |
   Al (PPM)            43.00    ******************************************************************************************
   pAl                 10.07    ******************************************************************************
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR LEAD:      |                       |                                            |                        |
   Pb (PPM)            17.00    ********************************************************
   pPb                 10.63    ********************************************************
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR NICKEL:    |                       |                                            |                        |
   Ni (PPM)             0.50    *************************|                                            |                        |
   pNi                 13.94    *************************|                                            |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR CADMIUM:   |                       |                                            |                        |
   Cd (PPM)             0.13    **************************                                            |                        |
   pCd                 12.70    **************************                                            |                        |
                                |                       |                                            |                        |
                                |----------LOW----------|--------------------NORMAL--------------------|----------HIGH----------|
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

: SAMPLE ID: TOPSOIL SAUGUS MA

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=16.20 DILUTION FACTOR= 1.00

11/29/95	3070	041138	CENTRE	00	SAUGUS	TURF ESTAB
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

L M DINC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

				LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH				X			
Phosphate	(P_2O_5)	_____	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Potash	(K_2O)	_____	lb/A	XXXXXX			
Magnesium	(MgO)	_____	lb/A	XXX			
Calcium	(Ca)	_____	lb/A	X			

RECOMMENDATIONS FOR: *INDUSTRIAL LAWN- TO PLANT (KY. BLUE OR RYEGRASS)*

See Back For Comments

LIMESTONE: *10200* LBS PER ACRE — 1,3

ORGANIC MATTER: *NONE* CU. YDS. PER ACRE

APPLY THE FOLLOWING FERTILIZER NUTRIENTS AS INDICATED - AMOUNTS ARE IN LBS/ACRE

		NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	
BASIC FERTILIZER		*NONE*	*80*	*240*	3,4
PLUS	QUICKLY AVAILABLE NITROGEN	*60*			
STARTER FERTILIZER	*OR*		*30*	*30*	5,6
	SLOWLY AVAILABLE NITROGEN	*120*			

MESSAGES:

CONTACT YOUR COUNTY AGENT IF YOU NEED ASSISTANCE IN INTERPRETING THIS RECOMMENDATION.

LABORATORY RESULTS:

5.3	148	10.2	0.11	0.2	1.8	12.3	0.8	1.9	14.2
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

ORGANIC MATTER - 5.0 %

06/04/96	8295	016496	OUT OF STATE	00	BRADFD	TURF ESTAB
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR

P NEUMAN/GOLDER ASSC
400 COMMERCIAL ST
MANCHESTER NH 03101

COPY SENT TO:

DALE E BAKER/LMD
3048 RESEARCH DR
STATE COLLEGE PA 16801

SOIL NUTRIENT LEVELS

		LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH		X			
Phosphate	(P_2O_5)	XXXXXXXXXXXXXXXXXXXXX			
Potash	(K_2O)	XXXXXXXXXXXX			
Magnesium	(MgO)	XXXXX			
Calcium	(Ca)	X			

RECOMMENDATIONS FOR *PARK AREA - TO PLANT (KY. BLUE OR RYEGRASS)*

See Back For Comments

LIMESTONE: *7800* LBS PER ACRE — 1,3

ORGANIC MATTER: *NONE* CU. YDS. PER ACRE

APPLY THE FOLLOWING FERTILIZER NUTRIENTS AS INDICATED - AMOUNTS ARE IN LBS/ACRE

		NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	
BASIC FERTILIZER		*NONE*	*80*	*240*	3,4
PLUS STARTER FERTILIZER	QUICKLY AVAILABLE NITROGEN	*60*			
	OR		*30*	*30*	5,6
	SLOWLY AVAILABLE NITROGEN	*120*			

MESSAGES

CONTACT YOUR COUNTY AGENT IF YOU NEED ASSISTANCE IN INTERPRETING THIS RECOMMENDATION.

LABORATORY RESULTS

5.3	109	7.8	0.14	0.3	1.0	9.2	1.5	3.2	10.8
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

ORGANIC MATTER - 3.6 %

SOIL31 TURF ESTAB.

INDUSTRY COPY

PETER NEUMAN/GOLDER ASSOC.

COMMERCIAL ST.
CHESTER NH 03101

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801
SOIL CHEMISTRY, LAND & WASTE MANAGEMENT DECISIONS USING
CHEMICAL ANALYSES FROM CENTRE ANALYTICAL LABORATORIES, INC.

TM

LMD INTERPRETATION OF BAKER SOIL TEST (BST) DATA.
THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
NEUMAN96	06-14-1996	8295	OOS	L11469	3.90	5.30	5.30	9.20	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC(PPB)	65.81	**********		
Mehlich 3 P (PPM)	54.50	**********		
BAKER SOIL TEST POTASSIUM:				
BST pK	3.53	**********		
BST K (PPM)	13.40	**********		
Exchangeable (ppm)	54.60	**********		
Percent Of CEC	1.52	**********		
BAKER SOIL TEST MAGNESIUM:				
BST pMg	3.17	**********		
BST Mg (PPM)	29.00	**********		
Exchangeable (PPM)	36.00	*****		
Percent of CEC	3.26	*		
SOIL TEST CALCIUM:				
pCa	2.59	**********		
BST Ca (PPM)	192.50	**********		
Exchangeable (PPM)	200.00	*		
Percent of CEC	10.87	*		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/H	4.05	*		
Mg/K	1.94	**********		
Ca/Mg	0.58	**********		
		LOW	NORMAL	
BAKER SOIL TEST MANGANESE:				
BST pMn	9.32	*		
BST Mn (PPM)	0.30	*		
BAKER SOIL TEST IRON:				
BST pFe	21.77	**		
BST Fe (PPM)	0.20	*		
BAKER SOIL TEST COPPER:				
BST pCu	14.93	**********		
BST Cu (PPM)	0.50	******		
BAKER SOIL TEST ZINC:				
pZn	12.40	*********		
BST Zn (PPM)	0.45	***		
		LOW	NORMAL	HIGH

PETER NEUMAN/GOLDER ASSOCFILE NEUMAN96

```
                                |----------LOW----------|--------------------NORMAL--------------------|----------HIGH----------|
   -ESSENTIAL ELEMENTS          |                       |                                            |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST SODIUM:        |                       |                                            |                        |
  BST  Na (PPM)        13.90    *******                 |                                            |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST ALUMINUM:      |                       |                                            |                        |
  BST  Al (PPM)         0.34    **                      |                                            |                        |
  BST  pAl             12.68    ******************      |                                            |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST LEAD:          |                       |                                            |                        |
  BST  Pb (PPM)         0.06    *                       |                                            |                        |
  BST  pPb             13.58    *                       |                                            |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR NICKEL:    |                       |                                            |                        |
  BST  Ni (PPM)         0.05    **                      |                                            |                        |
  BST  pNi             15.25    *                       |                                            |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR CADMIUM:   |                       |                                            |                        |
  BST  Cd (PPM)         0.00    *                       |                                            |                        |
  BST  pCd             99.99    *                       |                                            |                        |
                                |                       |                                            |                        |
                                |----------LOW----------|--------------------NORMAL--------------------|----------HIGH----------|
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

E: BAKER SOIL TEST WITHOUT TOTAL SORBED METALS

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.59 DILUTION FACTOR= 1.00

GOLDER ASSOCIATES INC
ATTN PETER NEUMANN
ATLANTIC AVE
BURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD INTERPRETATION OF BAKER SOIL TEST™ (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
L9653-1	11-08-1995	8944			1.50	6.40	6.90	12.20	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC (PPB)	76.22	**********		
Mehlich 3 P (PPM)	61.00	**********		
POTASSIUM:				
BST pK	3.20	**********	**********	
BST K (PPM)	28.00	**********	**********	
Exchangeable (ppm)	171.60	**********	**********	
Percent Of CEC	3.61	**********	**********	
MAGNESIUM:				
BST pMg	3.14	**********		
BST Mg (PPM)	31.00	**********		
Exchangeable (PPM)	180.00	**********	**********	
Percent of CEC	12.30	**********	**********	
CALCIUM:				
BST pCa	2.61	**********		
Ca (PPM)	177.00	**********		
Exchangeable (PPM)	1660.00	**********	**********	
Percent of CEC	68.03	**********	**********	
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/H	5.65	**********	**********	
Mg/K	1.64	**********		
Ca/Mg	0.53	**********	**********	
		LOW	NORMAL	HIGH
BAKER SOIL TEST (BST) MANGANESE:				
BST pMn	7.77			
BST Mn (PPM)	29.00	**********		
BST pFe	19.37	**********	**********	
BAKER SOIL TEST IRON:				
BST Fe (PPM)	150.00	**********	**********	**********
BAKER SOIL TEST COPPER:				
BST pCu	14.53	**********		
BST Cu (PPM)	2.30	**********		
BAKER SOIL TEST ZINC:				
BST pZn	10.93	**********		
Zn (PPM)	8.30	**********		
		LOW	NORMAL	HIGH

GOLDER ASSOCIATES INC FILE L9653-1

```
                                |----------LOW----------|--------------------NORMAL--------------------|----------HIGH----------|
    -ESSENTIAL ELEMENTS         |                       |                                            |                        |
                                |                       |                                            |                        |
 .AKER SOIL TEST FOR SODIUM:    |                       |                                            |                        |
   Na (PPM)            53.00    **************************                                           |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR ALUMINUM:  |                       |                                            |                        |
   Al (PPM)             2.80    **************          |                                            |                        |
   pAl                 12.24    **************          |                                            |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR LEAD:      |                       |                                            |                        |
   Pb (PPM)             1.20    ***************         |                                            |                        |
   pPb                 12.60    ***************         |                                            |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR NICKEL:    |                       |                                            |                        |
   Ni (PPM)             0.70    **************************                                           |                        |
   pNi                 13.85    **************************                                           |                        |
                                |                       |                                            |                        |
 BAKER SOIL TEST FOR CADMIUM:   |                       |                                            |                        |
   Cd (PPM)             0.14    **************************                                           |                        |
   pCd                 13.61    **************************                                           |                        |
                                |                       |                                            |                        |
                                |----------LOW----------|--------------------NORMAL--------------------|----------HIGH----------|
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

E:

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.16 DILUTION FACTOR= 1.00

DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL
11/06/95	8944	041139	CENTRE	00	NASHUA	UNSPECIFIED

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS

				LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH		6.4		XXXXXXXXXXXXXX			
Phosphate	(P_2O_5)	280	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Potash	(K_2O)	412	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Magnesium	(MgO)	588	lb/A	XXXXXXXXXXXXXXXXXXX			

RECOMMENDATIONS FOR: *ESTABLISHED MIXED GRASSES* (For other crops see ST 2 column: 9) — See Back For Comments

YIELD GOAL 5.0 TONS (PER ACRE)

LIMESTONE: 3000 lb/A Calcium Carbonate Equivalent — 1,2 3,4

FOR A 9 - 11" PLOW DEPTH, THE LIMESTONE RECOMMENDATION WAS MULTIPLIED BY 1.5

PLANT NUTRIENT NEEDS:	NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)	
	@@@ lb/A	0 lb/A	0 lb/A	0 lb/A	5

MESSAGES:

* FOR ALFALFA AND BARLEY, THE PH GOAL IS 7.0. FOR ALL OTHER CROPS, THE LIMESTONE RECOMMENDATION, IF ANY, IS TO BRING THE PH TO 6.5. TO ESTIMATE THE LIME REQUIREMENT FOR PH 7.0 FOR THESE CROPS, MULTIPLY THE EXCHANGEABLE ACIDITY BY 1000.

* IF MANURE WILL BE APPLIED, SEE ST-10 "USE OF MANURE" — 9

@@@ NITROGEN RECOMMENDATION : APPLY 40 LBS OF N PER TON OF YIELD EXPECTED FROM EACH CUTTING. FOR OPTIMUM EFFICIENCY, THE NITROGEN SHOULD BE APPLIED SEPERATELY FOR EACH CUTTING. ANY RECOMMENDED PHOSPHATE OR POTASH SHOULD BE APPLIED WITH THE NITROGEN AFTER ONE OF THE CUTTINGS.

LABORATORY RESULTS:

SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
6.4	122	2.0	0.44	1.5	8.3	12.2	3.6	12.5	67.6
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

Golder Associates Inc.
400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To: Land Management Decision Inc.
Baker Soil Test
3048 Research Drive
State College, PA 16801

Date: November 9, 1995
Project No.: 933-6142.960

Sent by:

- [ ] Mail
- [ ] Courier
- [ ] Hand Carried
- [ ] Under Separate Cover
- [x] Federal Express
- [ ] Enclosed

Quantity	Item	Description
1	Soil Sample	Topsoil, Saugus, MA SEND INVOICE TO Mr. David Baumgartner, Proj. Mgr. ISRT 41 Atlantic Ave. Woburn, MA 01801

Remarks: Run 1 Baker Soil Test only.
Crop is turf - no fertilizer has been added.
If you have any questions call (617) 932-9599

Per Peter Neumann
Resident Engineer

NOV 08 95 21:55 [illegible]

GOLDER ASSOCIATES INC
ATTN PETER NEUMANN
ATLANTIC AVE
OBURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD™ INTERPRETATION OF BAKER SOIL TEST (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93, STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
L9653-1	11-08-1995	8944			1.50	6.40	6.90	12.20	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC (PPB)	76.22	**********		
Mehlich 3 P (PPM)	61.00	**********		
POTASSIUM:				
BST pK	3.20	**********		
BST K (PPM)	28.00	**********		
Exchangeable (ppm)	171.60	**********		
Percent Of CEC	3.61	**********		
MAGNESIUM:				
BST pMg	3.14	**********		
BST Mg (PPM)	31.00	**********		
Exchangeable (PPM)	180.00	**********		
Percent of CEC	12.30	**********		
CALCIUM:				
BST pCa	2.61	**********		
Ca (PPM)	177.00	**********		
Exchangeable (PPM)	1660.00	**********		
Percent of CEC	68.03	**********		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/H	5.65	**********		
Mg/K	1.64	**********		
Ca/Mg	0.53	**********		
		LOW	NORMAL	
BAKER SOIL TEST (BST) MANGANESE:				
BST pMn	7.77			
BST Mn (PPM)	29.00	**********		
BST pFe	19.37	**********		
BAKER SOIL TEST IRON:				
BST Fe (PPM)	150.00	**********		
BAKER SOIL TEST COPPER:				
BST pCu	14.53	**********		
BST Cu (PPM)	2.30	**********		
BAKER SOIL TEST ZINC:				
BST pZn	10.93	**********		
BST Zn (PPM)	8.30	**********		
		LOW	NORMAL	HIGH

OLDER ASSOCIATES INC FILE L9653-1

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                                |----------LOW----------|--------------------NORMAL--------------------|----------HIGH---------
  -ESSENTIAL ELEMENTS           |                       |                                            |
                                |                       |                                            |
BAKER SOIL TEST FOR SODIUM:     |                       |                                            |
  Na (PPM)            53.00     *************************                                            |
                                |                       |                                            |
BAKER SOIL TEST FOR ALUMINUM:   |                       |                                            |
  Al (PPM)             2.80     **************          |                                            |
  pAl                 12.24     **************          |                                            |
                                |                       |                                            |
BAKER SOIL TEST FOR LEAD:       |                       |                                            |
  Pb (PPM)             1.20     ***************         |                                            |
  pPb                 12.60     ***************         |                                            |
                                |                       |                                            |
BAKER SOIL TEST FOR NICKEL:     |                       |                                            |
  Ni (PPM)             0.70     **************************                                           |
  pNi                 13.85     **************************                                           |
                                |                       |                                            |
BAKER SOIL TEST FOR CADMIUM:    |                       |                                            |
  Cd (PPM)             0.14     **************************                                           |
  pCd                 13.61     **************************                                           |
                                |                       |                                            |
                                |----------LOW----------|--------------------NORMAL--------------------|----------HIGH---------
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

E:

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.16 DILUTION FACTOR= 1.00

11/06/95	8944	041139	CENTRE	00	NASHUA	[illegible]
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

				LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH		6.4		XXXXXXXXXXXXXXX			
Phosphate	(P_2O_5)	280	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Potash	(K_2O)	412	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Magnesium	(MgO)	588	lb/A	XXXXXXXXXXXXXXXXXXXX			

RECOMMENDATIONS FOR: *ESTABLISHED MIXED GRASSES* (For other crops see ST 2 column: g) — See Back For Comments

YIELD GOAL 5.0 TONS (PER ACRE) — 1,2

LIMESTONE: 3000 lb/A Calcium Carbonate Equivalent — 3,4

FOR A 9 - 11" PLOW DEPTH, THE LIMESTONE RECOMMENDATION WAS MULTIPLIED BY 1.5

PLANT NUTRIENT NEEDS:

NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)
@@@ lb/A	0 lb/A	0 lb/A	0 lb/A

5

MESSAGES:

* FOR ALFALFA AND BARLEY, THE PH GOAL IS 7.0. FOR ALL OTHER CROPS, THE LIMESTONE RECOMMENDATION, IF ANY, IS TO BRING THE PH TO 6.5. TO ESTIMATE THE LIME REQUIREMENT FOR PH 7.0 FOR THESE CROPS, MULTIPLY THE EXCHANGEABLE ACIDITY BY 1000.

* IF MANURE WILL BE APPLIED, SEE "HOW TO USE OF MANURE" — 9

@@@ NITROGEN RECOMMENDATION
APPLY 40 LBS OF N PER TON OF YIELD EXPECTED FROM EACH CUTTING. FOR OPTIMUM EFFICIENCY, THE NITROGEN SHOULD BE APPLIED SEPERATELY FOR EACH CUTTING. ANY RECOMMENDED PHOSPHATE OR POTASH SHOULD BE APPLIED WITH THE NITROGEN AFTER ONE OF THE CUTTINGS.

LABORATORY RESULTS:

6.4	122	2.0	0.44	1.5	8.3	12.2	3.6	12.5	67.6
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

Golder Associates Inc.

400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To: Land Management Decisions Inc.
Baker Soil Test
3048 Research Drive
State College, PA 16801

Date: October 30, 1995
Project No.: 933-6142.960

Sent by:

- [ ] Mail
- [ ] Courier
- [ ] Hand Carried
- [ ] Under Separate Cover
- [x] Federal Express
- [ ] Enclosed

Quantity	Item	Description
1	Soil Sample	Topsoil, Nashua Blend Note *

Remarks: Run ① Baker Soil Test only
~~② Organic~~ (PCN)
Crop is turf - no fertilizer has been added
If you have any questions call (617) 932-9599

SEND INVOICE DIRECTLY TO
Mr. David Baumgartner, Proj. Mgr.
ISRT
41 Atlantic Ave.
Woburn, MA 01801

Per Peter Neumann
Resident Engineer

07/18/95	5718	016012	CENTRE	00	MA	UNCLASSIFIED
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

L M D INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

				LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH		5.0		X			
Phosphate	(P_2O_5)	74	lb/A	XXXXXXXX			
Potash	(K_2O)	66	lb/A	XXXX			
Magnesium	(MgO)	68	lb/A	XX			

RECOMMENDATIONS FOR: *PLANTING MIXED GRASSES* (For other crops see ST 2 column: 1)

See Back For Comments

YIELD GOAL 4.0 TONS (PER ACRE)

LIMESTONE: *14400* lb/A Calcium Carbonate Equivalent 1,2 3,4

FOR A 9 - 11" PLOW DEPTH, THE LIMESTONE RECOMMENDATION WAS MULTIPLIED BY 1.5

PLANT NUTRIENT NEEDS:	NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)
	20 lb/A	*120* lb/A	*350* lb/A	*410* lb/A

5

MESSAGES:

* USE A STARTER FERTILIZER (FOR DETAILS, SEE COMMENTS ON BACK--->) 6
* FOR ALFALFA AND BARLEY, THE PH GOAL IS 7.0. FOR ALL OTHER CROPS, THE LIMESTONE RECOMMENDATION, IF ANY, IS TO BRING THE PH TO 6.5. TO ESTIMATE THE LIME REQUIREMENT FOR PH 7.0 FOR THESE CROPS, MULTIPLY THE EXCHANGEABLE ACIDITY BY 1000.
* RECOMMENDED LIMESTONE CONTAINING 2.8% MGO WILL MEET THE MG REQUIREMENT.
* IF MANURE WILL BE APPLIED, SEE ST-10 "USE OF MANURE". 9
* AN ADDITIONAL 30 LB. OF NITROGEN CAN BE APPLIED IN THE LATE SUMMER IF PRODUCTION WARRANTS.
* IN FOLLOWING YEARS, APPLY 40 LBS. OF N PER TON OF YIELD EXPECTED FROM EACH CUTTING. FOR OPTIMUM EFFICIENCY, THE NITROGEN SHOULD BE APPLIED SEPERATELY FOR EACH CUTTING.

LABORATORY RESULTS:

5.0	32	11.4	0.07	0.2	0.8	12.4	0.5	1.4	6.0
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

SOIL01 AGRONOMIC

GOLDER ASSOCIATES INC
ATTN PETER NEUMANN
41 ATLANTIC AVE

URN MA 01801

LMD INTERPRETATION OF BAKER SOIL TEST™ (BST) DATA.
THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
L	07-21-1995	5718			7.20	5.00	5.31	12.40	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC (PPB)	5.13	***		
Mehlich 3 P (PPM)	16.00	**********		
BAKER SOIL TEST POTASSIUM:				
BST pK	3.90	********		
BST K (PPM)	5.60	**********		
Exchangeable (ppm)	27.30	*		
Percent Of CEC	0.56	******		
BAKER SOIL TEST MAGNESIUM:				
BST pMg	3.47	****		
BST Mg (PPM)	14.50	**********		
Exchangeable (PPM)	24.00	*		
Percent of CEC	1.61	*		
BAKER SOIL TEST CALCIUM:				
pCa	2.83	*		
Ca (PPM)	112.00	**********		
Exchangeable (PPM)	160.00	*		
Percent of CEC	6.45	*		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/K	3.94	*		
Mg/K	2.17	**********		
Ca/Mg	0.64	**********		

		LOW	BACK-GROUND AVERAGE	NORMAL	HIGH
BAKER SOIL TEST (BST) MANGANESE:					
BST pMn	7.90	**********			
BST Mn (PPM)	7.90	**********			
BST pFe	19.18	**********			
BAKER SOIL TEST IRON:					
BST Fe (PPM)	78.00	**********			
BAKER SOIL TEST COPPER:					
BST pCu	14.74	**********			
BST Cu (PPM)	0.78	**********			
BAKER SOIL TEST ZINC:					
BST pZn	11.59	**********			
BST Zn (PPM)	2.90	**********			

	LOW	BACK-GROUND AVERAGE	NORMAL	HIGH

GOLDER ASSOCIATES INC FILE L

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                                |----------LOW-----BACK-GROUND---------------NORMAL-------------------|----------HIGH---------
 NT NON-ESSENTIAL ELEMENTS      |                   AVERAGE                                          |
                                |                      |                                             |
 ER SOIL TEST FOR SODIUM:       |                      |                                             |
 Na (PPM)            34.00      ****************       |                                             |
                                |                      |                                             |
BAKER SOIL TEST FOR ALUMINUM:   |                      |                                             |
 Al (PPM)            14.00      ******************************************************              |
 pAl                 11.07      ******************************************************              |
                                |                      |                                             |
BAKER SOIL TEST FOR LEAD:       |                      |                                             |
 Pb (PPM)             3.50      ****************************                                          |
 pPb                 11.78      ****************************                                          |
                                |                      |                                             |
BAKER SOIL TEST FOR NICKEL:     |                      |                                             |
 Ni (PPM)             0.14      *******                |                                             |
 pNi                 14.79      *******                |                                             |
                                |                      |                                             |
BAKER SOIL TEST FOR CADMIUM:    |                      |                                             |
 Cd (PPM)             0.10      ************************|                                             |
 pCd                 13.33      ************************|                                             |
                                |                      |                                             |
                                |----------LOW-----BACK-GROUND---------------NORMAL-------------------|----------HIGH---------
                                                   AVERAGE
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

TE: SAMPLE ID: TOPSOIL FROM TEWKSBURY MA
Cd <0.1 PPM

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.62 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS OF RESULTS.

Golder Associates Inc.

400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To: Land Management Decisions Inc.
Baker Soil Test
3048 Research Drive
State College, PA 16801
Attn: Dr. Senft.

Date: 7/11/95
Project No.: 933-6142.960

Sent by:

- [ ] Mail
- [ ] Courier
- [ ] Hand Carried
- [ ] Under Separate Cover
- [x] Federal Express
- [ ] Enclosed

Quantity	Item	Description
1	Soil Sample	Topsoil from Tewksbury, MA
1	Soil Sample	Topsoil from Bedford, NH
		NOTE: SEND INVOICE DIRECTLY TO: Mr. David Baumgartner, Project Mgr. ISRI 41 Atlantic Ave. Woburn, MA 01801
		First Priority

Remarks: Run a standard Baker Soil Test only
Crop is turf - no fertilizers have been added.
If you have questions, call (617) 932-9599

Per Peter Neumann
Resident Engineer

Golder Associates Inc.

400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To: Land Management Decisions Inc.
Baker Soil Test
3048 Research Drive
State College, PA 16801
Attention - Dr. Senft.

Date: 5/15/95
Project No.: 933-6142.960

Sent by:

- [ ] Mail
- [ ] Courier
- [ ] Hand Carried
- [ ] Under Separate Cover
- [x] Federal Express
- [ ] Enclosed

Quantity	Item	Description
1	Soil Sample	Topsoil from Hudson, NH

Remarks: Run ① Baker Soil Test only
Crop is turf - no fertilizers have been added
If you have questions call ((617) 932-9599)

Per Peter Neumann
Resident Engineer

INDUSTRI-PLEX SITE REMEDIAL
TN PETER NEUMANN
ATLANTIC AVE
WOBURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD INTERPRETATION OF BAKER SOIL TEST™ (BST) DATA.
THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B12	05-26-1995	2404			1.30	6.50	6.75	9.30	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC (PPB)	49.10	**********		
Mehlich 3 P (PPM)	44.00	**********		
BAKER SOIL TEST POTASSIUM:				
BST pK	3.59	**********		
BST K (PPM)	11.50	**********		
Exchangeable (ppm)	62.40	**********		
Percent Of CEC	1.72	**********		
BAKER SOIL TEST MAGNESIUM:				
BST pMg	3.11	**********		
BST Mg (PPM)	32.70	**********		
Exchangeable (PPM)	192.00	**********		
Percent of CEC	17.20	**********		
ER SOIL TEST CALCIUM:				
pCa	2.66	**********		
T Ca (PPM)	163.00	**********		
changeable (PPM)	1000.00	**********		
Percent of CEC	53.76	**********		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/H	5.49	**********		
Mg/K	2.03	**********		
Ca/Mg	0.45	**********		

		LOW	BACK-GROUND AVERAGE	NORMAL	HIGH
BAKER SOIL TEST (BST) MANGANESE:					
BST pMn	9.45	*			
BST Mn (PPM)	1.20	**			
BST pFe	20.31	**********			
BAKER SOIL TEST IRON:					
BST Fe (PPM)	34.60	**********			
BAKER SOIL TEST COPPER:					
BST pCu	15.06	**********			
BST Cu (PPM)	1.35	**********			
AKER SOIL TEST ZINC:					
pZn	11.96	**********			
T Zn (PPM)	1.62	**********			

	LOW	BACK-GROUND AVERAGE	NORMAL	HIGH

INDUSTRI-PLEX SITE REMEDIFILE B12

```
                                |----------LOW------BACK-GROUND---------------NORMAL-------------------|------------HIGH---------|
    T NON-ESSENTIAL ELEMENTS    |                    AVERAGE                                          |                         |
                                |                      |                                              |                         |
  AKER SOIL TEST FOR SODIUM:    |                      |                                              |                         |
    Na (PPM)            19.10   **********             |                                              |                         |
                                |                      |                                              |                         |
 BAKER SOIL TEST FOR ALUMINUM:  |                      |                                              |                         |
    Al (PPM)            24.80   ******************************************************************************************
    pAl                 11.58   ************************************************                     |                         |
                                |                      |                                              |                         |
 BAKER SOIL TEST FOR LEAD:      |                      |                                              |                         |
    Pb (PPM)            33.50   ******************************************************************************************
    pPb                 11.46   ********************************************************             |                         |
                                |                      |                                              |                         |
 BAKER SOIL TEST FOR NICKEL:    |                      |                                              |                         |
    Ni (PPM)             0.29   **************         |                                              |                         |
    pNi                 14.55   **********************  |                                              |                         |
                                |                      |                                              |                         |
 BAKER SOIL TEST FOR CADMIUM:   |                      |                                              |                         |
    Cd (PPM)             0.10   *************************|                                             |                         |
    pCd                 14.05   **************************                                             |                         |
                                |                      |                                              |                         |
                                |----------LOW------BACK-GROUND---------------NORMAL-------------------|------------HIGH---------
                                                       AVERAGE
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

E: SAMPLE ID: TOPSOIL FROM HUDSON NH (5-95)
BST Cd <0.1 PPM
ORGANIC MATTER 5.0%

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=14.82 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS OF RESULTS.

05/25/95	2404	069986	CENTRE	00	HUDSON	TURF ESTAB
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

L M D INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

			LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH			XXXXXXXXXXXX			
Phosphate	(P_2O_5)	lb/A	XXXXXXXXXXXXXXXX			
Potash	(K_2O)	lb/A	XXXXXXXXXXXXX			
Magnesium	(MgO)	lb/A	XXXXXXXXXXXXXXXXXXXXXX			
Calcium	(Ca)	lb/A	XXXXXXXXX			

RECOMMENDATIONS FOR: *INDUSTRIAL LAWN- TO PLANT (KY. BLUE OR RYEGRASS)*

See Back For Comments

LIMESTONE: 2500 LBS PER ACRE — 1,3

ORGANIC MATTER: NONE CU. YDS. PER ACRE

APPLY THE FOLLOWING FERTILIZER NUTRIENTS AS INDICATED - AMOUNTS ARE IN LBS/ACRE

		NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	
BASIC FERTILIZER		NONE	160	240	3,4
PLUS	QUICKLY AVAILABLE NITROGEN	60			
STARTER FERTILIZER	*OR*		30	30	5,6
	SLOWLY AVAILABLE NITROGEN	120			

MESSAGES:

CONTACT YOUR COUNTY AGENT IF YOU NEED ASSISTANCE IN INTERPRETING THIS RECOMMENDATION.

LABORATORY RESULTS:

6.5	88	2.5	0.16	1.6	5.0	9.3	1.7	17.4	53.7
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

ORGANIC MATTER - 5.0 %

Golder Associates Inc.

400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To: Land Management Decisions Inc.
Baker Soil Test
3048 Research Drive
State College

Date: 4/19/95
Project No.: 933-6142.960

Sent by:

- [ ] Mail
- [ ] Courier
- [ ] Hand Carried
- [ ] Under Separate Cover
- [ ] Federal Express
- [ ] Enclosed

Quantity	Item	Description
1	Soil Sample	Topsoil from Reading, MA
1	Soil Sample	Topsoil from New Boston, NH
1	Soil Sample	Topsoil from Manchester, NH

Remarks: Run ① Baker Soil Test
② Organic Content

Crop is turf - no fertilizers have been added
If you have questions call (617) 932-9599

Per Peter Neumann
Resident Engineer

SEND INVOICE DIRECTLY TO:
Mr. David Baumgartner, Project Mgr.
ISRT
41 Atlantic Ave.
Woburn, MA 01801

04/27/95	8280	069975	CENTRE	00	MAN	UNSPECIFIED
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:
LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

		Value	Unit	LOW / OPTIMUM / HIGH / EXCESSIVE
Soil pH		4.8		X
Phosphate	(P_2O_5)	351	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Potash	(K_2O)	84	lb/A	XXXXXX
Magnesium	(MgO)	114	lb/A	XXXX

RECOMMENDATIONS FOR: PLANTING MIXED GRASSES (For other crops see ST 2 column: 7)

See Back For Comments

YIELD GOAL 5.0 TONS (PER ACRE)

1,2
3,4

LIMESTONE: 11300 lb/A Calcium Carbonate Equivalent

FOR A 9 - 11" PLOW DEPTH, THE LIMESTONE RECOMMENDATION WAS MULTIPLIED BY 1.5

PLANT NUTRIENT NEEDS:	NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)	
	20 lb/A	0 lb/A	290 lb/A	290 lb/A	5

MESSAGES:

* USE A STARTER FERTILIZER (FOR DETAILS, SEE COMMENTS ON BACK--->) 6
* FOR ALFALFA AND BARLEY, THE PH GOAL IS 7.0. FOR ALL OTHER CROPS, THE LIMESTONE RECOMMENDATION, IF ANY, IS TO BRING THE PH TO 6.5. TO ESTIMATE THE LIME REQUIREMENT FOR PH 7.0 FOR THESE CROPS, MULTIPLY THE EXCHANGEABLE ACIDITY BY 1000.
* RECOMMENDED LIMESTONE CONTAINING 2.5% MGO WILL MEET THE MG REQUIREMENT.
* IF MANURE WILL BE APPLIED, SEE ST-10 "USE OF MANURE". 9
* AN ADDITIONAL 30 LB. OF NITROGEN CAN BE APPLIED IN THE LATE SUMMER IF PRODUCTION WARRANTS.
* IN FOLLOWING YEARS, APPLY 40 LBS. OF N PER TON OF YIELD EXPECTED FROM EACH CUTTING. FOR OPTIMUM EFFICIENCY, THE NITROGEN SHOULD BE APPLIED SEPERATELY FOR EACH CUTTING.

LABORATORY RESULTS:

4.8	153	9.0	0.09	0.3	1.0	10.4	0.8	2.8	9.6
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

INDUSTRI-PLEX SITE REMEDIAL TRUST
TTN PETER NEUMANN
ATLANTIC AVE
JBURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD™ INTERPRETATION OF BAKER SOIL TEST (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B31	04-28-1995	8280			5.70	4.80	5.10	10.40	0.00

TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:			
CALCULATED EPC(PPB) 101.22	**********		
Mehlich 3 P (PPM) 76.50	**********		
BAKER SOIL TEST POTASSIUM:			
BST pK 3.60	**********		
BST K (PPM) 11.30	**********		
Exchangeable (ppm) 35.10	*		
Percent Of CEC 0.87	**********		
BAKER SOIL TEST MAGNESIUM:			
BST pMg 3.27	**********		
BST Mg (PPM) 23.00	**********		
Exchangeable (PPM) 36.00	*****		
Percent of CEC 2.88	*		
BAKER SOIL TEST CALCIUM:			
pCa 2.66	**********		
Ca (PPM) 156.00	**********		
Exchangeable (PPM) 200.00	*		
Percent of CEC 9.62	*		
BAKER SOIL TEST CATION RATIOS:			
(Ca plus Mg)/H 3.82	*		
Mg/K 1.97	**********		
Ca/Mg 0.60	**********		

	LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST MANGANESE:			
BST pMn 7.20	**********		
BST Mn (PPM) 9.50	**********		
BAKER SOIL TEST IRON:			
BST pFe 18.69	**********		
BST Fe (PPM) 55.00	**********		
BAKER SOIL TEST COPPER:			
BST pCu 13.90	**********		
BST Cu (PPM) 1.50	**********		
BAKER SOIL TEST ZINC:			
BST pZn 11.29	**********		
BST Zn (PPM) 1.90	**********		

	LOW	NORMAL OPTIMUM	HIGH

INDUSTRI-PLEX SITE REMEDIFILE B31

```
                                                                NORMAL
                              |----------LOW----------|-------------------OPTIMUM------------------|----------HIGH---------
 N-ESSENTIAL ELEMENTS         |                       |                                          |
                              |                       |                                          |
BAKER SOIL TEST SODIUM:       |                       |                                          |
 BST  Na (PPM)        78.00   ************************************          |                     |
                              |                       |                                          |
BAKER SOIL TEST ALUMINUM:     |                       |                                          |
 BST  Al (PPM)        61.00   ******************************************************************************************
 BST  pAl              9.81   ******************************************************************************
                              |                       |                                          |
BAKER SOIL TEST LEAD:         |                       |                                          |
 BST  Pb (PPM)         4.50   ********************************                |                  |
 BST  pPb             11.08   ********************************                |                  |
                              |                       |                                          |
BAKER SOIL TEST FOR NICKEL:   |                       |                                          |
 BST  Ni (PPM)         0.60   *************************                         |                |
 BST  pNi             13.69   ************************************              |                |
                              |                       |                                          |
BAKER SOIL TEST FOR CADMIUM:  |                       |                                          |
 BST  Cd (PPM)         0.10   *************************|                        |                |
 BST  pCd             12.71   ****************************************************               |
                              |                       |                                          |
                              |----------LOW----------|-------------------NORMAL------------------|----------HIGH---------
                                                                      OPTIMUM
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC VITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

TE: SAMPLE ID: TOPSOIL FROM MANCHESTER NH
VOLATILE SOLIDS (APPROS. ORGANIC MATTER) 4.8%
BST Cd <0.1 PPM

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=16.29 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS.

04/27/95	8278	069973	CENTRE	00	READ	UNSPECIFIED
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

COPY SENT TO:

LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

00000

SOIL NUTRIENT LEVELS:

				LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH		5.3		X			
Phosphate	(P_2O_5)	371	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Potash	(K_2O)	66	lb/A	XXXXX			
Magnesium	(MgO)	114	lb/A	XXXX			

RECOMMENDATIONS FOR: *PLANTING MIXED GRASSES* (For other crops see ST 2 column: 7)

See Back For Comments

YIELD GOAL 5.0 TONS (PER ACRE)

1, 2

LIMESTONE: 11300 lb/A Calcium Carbonate Equivalent

3, 4

FOR A 9 - 11" PLOW DEPTH, THE LIMESTONE RECOMMENDATION WAS MULTIPLIED BY 1.5

PLANT NUTRIENT NEEDS:	NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)	
	20 lb/A	0 lb/A	320 lb/A	310 lb/A	5

MESSAGES:

* EXCESSIVE PHOSPHATE AND/OR POTASH LEVEL. 10
* USE A STARTER FERTILIZER (FOR DETAILS, SEE COMMENTS ON BACK--->) 6
* FOR ALFALFA AND BARLEY, THE PH GOAL IS 7.0. FOR ALL OTHER CROPS, THE LIMESTONE RECOMMENDATION, IF ANY, IS TO BRING THE PH TO 6.5. TO ESTIMATE THE LIME REQUIREMENT FOR PH 7.0 FOR THESE CROPS, MULTIPLY THE EXCHANGEABLE ACIDITY BY 1000.
* RECOMMENDED LIMESTONE CONTAINING 2.7% MGO WILL MEET THE MG REQUIREMENT.
* IF MANURE WILL BE APPLIED, SEE ST-10 "USE OF MANURE" 9
* AN ADDITIONAL 30 LB. OF NITROGEN CAN BE APPLIED IN THE LATE SUMMER IF PRODUCTION WARRANTS.
* IN FOLLOWING YEARS, APPLY 40 LBS. OF N PER TON OF YIELD EXPECTED FROM EACH CUTTING. FOR OPTIMUM EFFICIENCY, THE NITROGEN SHOULD BE APPLIED SEPERATELY FOR EACH CUTTING.

LABORATORY RESULTS:

5.3	161	9.0	0.07	0.3	1.5	10.9	0.6	2.7	13.7
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

INDUSTRI-PLEX SITE REMEDIAL TRUST
ATTN PETER NEUMANN
41 ATLANTIC AVE
WOBURN MA 01801

LMD INTERPRETATION OF BAKER SOIL TES
THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST F

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH
831	04-28-1995	8278			5.70	5.30

	TEST LEVEL	LOW	NORMAL
PHOSPHORUS:			
CALCULATED EPC(PPB)	107.72	**********	
Mehlich 3 P (PPM)	80.50	**********	
BAKER SOIL TEST POTASSIUM:			
BST pK	3.71	**********	
BST K (PPM)	8.80	**********	
Exchangeable (ppm)	27.30	*	
Percent Of CEC	0.64	*******	
BAKER SOIL TEST MAGNESIUM:			
BST pMg	3.27	**********	
BST Mg (PPM)	23.00	**********	
Exchangeable (PPM)	36.00	*****	
Percent of CEC	2.75	*	
BAKER SOIL TEST CALCIUM:			
BST pCa	2.64	**********	
BST Ca (PPM)	165.00	**********	
Exchangeable (PPM)	300.00	*	
Percent of CEC	13.76	*	
BAKER SOIL TEST CATION RATIOS:			
(Ca plus Mg)/K	4.13	***	
Mg/K	2.07	**********	
Ca/Mg	0.63	**********	

		LOW	NORMA OPTIMU
BAKER SOIL TEST MANGANESE:			
BST pMn	7.92	**********	
BST Mn (PPM)	3.90	*****	
BAKER SOIL TEST IRON:			
BST pFe	19.13	**********	
BST Fe (PPM)	46.00	**********	
BAKER SOIL TEST COPPER:			
BST pCu	14.27	**********	
BST Cu (PPM)	1.10	**********	
BAKER SOIL TEST ZINC:			
BST pZn	11.65	**********	
BST Zn (PPM)	1.10	*******	

LOW NORM OPTIM

INDUSTRI-PLEX SITE REMEDIFILE B31

```
                                  |----------LOW----------|-------------------NORMAL-------------------|----------HIGH---------|
                                                                          OPTIMUM
 ON-ESSENTIAL ELEMENTS            |                       |                                           |                       |
                                  |                       |                                           |                       |
 BAKER SOIL TEST SODIUM:          |                       |                                           |                       |
  BST  Na (PPM)        59.00      ****************************                |                          |                       |
                                  |                       |                                           |                       |
 BAKER SOIL TEST ALUMINUM:        |                       |                                           |                       |
  BST  Al (PPM)        59.00      ******************************************************************************************
  BST  pAl             10.15      ************************************************************************
                                  |                       |                                           |                       |
 BAKER SOIL TEST LEAD:            |                       |                                           |                       |
  BST  Pb (PPM)         2.90      ***************************                 |                          |                       |
  BST  pPb             11.56      ***************************                 |                          |                       |
                                  |                       |                                           |                       |
 BAKER SOIL TEST FOR NICKEL:      |                       |                                           |                       |
  BST  Ni (PPM)         0.30      ***************          |                  |                          |                       |
  BST  pNi             14.11      ****************************                |                          |                       |
                                  |                       |                                           |                       |
 BAKER SOIL TEST FOR CADMIUM:     |                       |                                           |                       |
  BST  Cd (PPM)         0.13      *************************                   |                          |                       |
  BST  pCd             12.92      ************************************************                      |                       |
                                  |                       |                                           |                       |
                                  |----------LOW----------|-------------------NORMAL-------------------|----------HIGH---------
                                                                          OPTIMUM
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

JTE: SAMPLE ID: TOPSOIL FROM READING MA
VOLATILE SOLIDS (APPROX. ORGANIC MATTER) 4.2%

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.91 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS.

DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL
04/27/95	8279	069974	CENTRE	00	NB	UNSPECIFIED

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

				LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH		5.3		X			
Phosphate	(P_2O_5)	231	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXX			
Potash	(K_2O)	103	lb/A	XXXXXXXXX			
Magnesium	(MgO)	114	lb/A	XXXXX			

RECOMMENDATIONS FOR: *PLANTING MIXED GRASSES* (For other crops see ST 2 column: 4) — See Back For Comments

YIELD GOAL 5.0 TONS (PER ACRE)

LIMESTONE: *8100* lb/A Calcium Carbonate Equivalent — 1,2 3,4

FOR A 9 - 11" PLOW DEPTH, THE LIMESTONE RECOMMENDATION WAS MULTIPLIED BY 1.5

PLANT NUTRIENT NEEDS:

NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)
20 lb/A	*0* lb/A	*250* lb/A	*230* lb/A

5

MESSAGES:

* USE A STARTER FERTILIZER (FOR DETAILS, SEE COMMENTS ON BACK--->) — 6
* FOR ALFALFA AND BARLEY, THE PH GOAL IS 7.0. FOR ALL OTHER CROPS, THE LIMESTONE RECOMMENDATION, IF ANY, IS TO BRING THE PH TO 6.5. TO ESTIMATE THE LIME REQUIREMENT FOR PH 7.0 FOR THESE CROPS, MULTIPLY THE EXCHANGEABLE ACIDITY BY 1000.
* RECOMMENDED LIMESTONE CONTAINING 2.8% MGO WILL MEET THE MG REQUIREMENT.
* IF MANURE WILL BE APPLIED, SEE ST-10 "USE OF MANURE" — 9
* AN ADDITIONAL 30 LB. OF NITROGEN CAN BE APPLIED IN THE LATE SUMMER IF PRODUCTION WARRANTS.
* IN FOLLOWING YEARS, APPLY 40 LBS. OF N PER TON OF YIELD EXPECTED FROM EACH CUTTING. FOR OPTIMUM EFFICIENCY, THE NITROGEN SHOULD BE APPLIED SEPERATELY FOR EACH CUTTING.

LABORATORY RESULTS:

SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
5.3	101	6.5	0.11	0.3	2.0	8.9	1.2	3.3	22.4
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

INDUSTRI-PLEX SITE REMEDIAL TRUST
TN PETER NEUMANN
ATLANTIC AVE
WOBURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD™ INTERPRETATION OF BAKER SOIL TEST (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B31	04-28-1995	8279			4.10	5.30	5.70	8.90	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC(PPB)	59.43	**********		
Mehlich 3 P (PPM)	50.50	**********		
BAKER SOIL TEST POTASSIUM:				
BST pK	3.62	**********		
BST K (PPM)	10.70	**********		
Exchangeable (ppm)	42.90	***		
Percent Of CEC	1.24	**********		
BAKER SOIL TEST MAGNESIUM:				
BST pMg	3.29	**********		
BST Mg (PPM)	22.00	**********		
Exchangeable (PPM)	36.00	*****		
Percent of CEC	3.37	*		
BAKER SOIL TEST CALCIUM:				
BST pCa	2.65	**********		
BST Ca (PPM)	163.00	**********		
Exchangeable (PPM)	400.00	*		
Percent of CEC	22.47	*		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/H	4.42	**********		
Mg/K	1.98	**********		
Ca/Mg	0.64	**********		

		LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST MANGANESE:				
BST pMn	7.82	**********		
BST Mn (PPM)	9.00	**********		
BAKER SOIL TEST IRON:				
BST pFe	19.26	**********		
BST Fe (PPM)	64.00	**********		
BAKER SOIL TEST COPPER:				
BST pCu	13.96	**********		
BST Cu (PPM)	3.50	**********		
BAKER SOIL TEST ZINC:				
BST pZn	10.29	**********		
BST Zn (PPM)	30.00	**********		

	LOW	NORMAL OPTIMUM	HIGH

INDUSTRI-PLEX SITE REMEDIFILE B31

```
                                                                  NORMAL
                                |----------LOW----------|--------------------OPTIMUM------------------|----------HIGH----------|
 ON-ESSENTIAL ELEMENTS          |                       |                                          |                        |
                                |                       |                                          |                        |
BAKER SOIL TEST SODIUM:         |                       |                                          |                        |
 BST  Na (PPM)        55.00     ***************************                  |                     |                        |
                                |                       |                                          |                        |
BAKER SOIL TEST ALUMINUM:       |                       |                                          |                        |
 BST  Al (PPM)        39.00     ******************************************************************************************
 BST  pAl             10.59     ******************************************************************                       |
                                |                       |                                          |                        |
BAKER SOIL TEST LEAD:           |                       |                                          |                        |
 BST  Pb (PPM)        12.00     ***************************************************                                       |
 BST  pPb             11.17     ***************************************************                                       |
                                |                       |                                          |                        |
BAKER SOIL TEST FOR NICKEL:     |                       |                                          |                        |
 BST  Ni (PPM)         0.90     ***************************                                        |                        |
 BST  pNi             13.69     ************************************                               |                        |
                                |                       |                                          |                        |
BAKER SOIL TEST FOR CADMIUM:    |                       |                                          |                        |
 BST  Cd (PPM)         0.27     ******************************                                     |                        |
 BST  pCd             12.86     ***************************************************                                       |
                                |                       |                                          |                        |
                                |----------LOW----------|--------------------NORMAL------------------|----------HIGH----------|
                                                                  OPTIMUM
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

OTE: SAMPLE ID: TOPSOIL FROM NEW BOSTON NH
VOLATILE SOLIDS (APPROX. ORGANIC MATTER) 4.7%

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.65 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS.

INDUSTRI-PLEX SITE REMEDIAL TRUST
ATTN PETER NEUMANN
ATLANTIC AVE
URN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD INTERPRETATION OF BAKER SOIL TEST™ (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-92. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
BSI	04-28-1995	8278			5.70	5.30	5.40	10.90	0.00

TEST LEVEL		LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC(PPB)	107.72	**********		
Mehlich 3 P (PPM)	80.50	**********		
BAKER SOIL TEST POTASSIUM:				
BST pK	3.71	**********		
BST K (PPM)	8.30	**********		
Exchangeable (ppm)	27.30	*		
Percent of CEC	0.64	*******		
BAKER SOIL TEST MAGNESIUM:				
BST pMg	3.27	**********		
BST Mg (PPM)	23.00	**********		
Exchangeable (PPM)	36.00	*****		
Percent of CEC	2.75	*		
BAKER SOIL TEST CALCIUM:				
BST pCa	2.64	**********		
Ca (PPM)	165.00	**********		
Exchangeable (PPM)	300.00	*		
Percent of CEC	13.76	*		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/K	4.13	***		
Mg/K	2.07	**********		
Ca/Mg	0.63	**********		
		LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST MANGANESE:				
BST pMn	7.92	**********		
BST Mn (PPM)	3.90	*****		
BAKER SOIL TEST IRON:				
BST pFe	19.13	**********		
BST Fe (PPM)	46.00	**********		
BAKER SOIL TEST COPPER:				
BST pCu	14.27	**********		
BST Cu (PPM)	1.10	**********		
BAKER SOIL TEST ZINC:				
BST pZn	11.65	**********		
Zn (PPM)	1.10	*******		
		LOW	NORMAL OPTIMUM	HIGH

INDUSTRI-PLEX SITE REMEDIFILE 831

		LOW	NORMAL OPTIMUM	HIGH
N-ESSENTIAL ELEMENTS				
BAKER SOIL TEST SODIUM:				
BST Na (PPM)	59.00	**********		
BAKER SOIL TEST ALUMINUM:				
BST Al (PPM)	59.00	**********	**********	**********
BST pAl	10.15	**********	**********	
BAKER SOIL TEST LEAD:				
BST Pb (PPM)	2.90	**********		
BST pPb	11.56	**********		
BAKER SOIL TEST FOR NICKEL:				
BST Ni (PPM)	0.30	**********		
BST pNi	14.11	**********		
BAKER SOIL TEST FOR CADMIUM:				
BST Cd (PPM)	0.13	**********		
BST pCd	12.92	**********	**********	
		LOW	NORMAL OPTIMUM	HIGH

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

NOTE: SAMPLE ID: TOPSOIL FROM READING MA
VOLATILE SOLIDS (APPROX. ORGANIC MATTER) 4.2%

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.91 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS.

Golder Associates Inc.

400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To: Land Management Decisions Inc.
Baker Soil Test
3048 Research Drive
State College, PA 16801

Date: 4/7/95
Project No.: 933-6142.960

Attn: Dr. Senft

Sent by:

- [ ] Mail
- [ ] Courier
- [ ] Hand Carried
- [ ] Under Separate Cover
- [x] Federal Express
- [ ] Enclosed

Quantity	Item	Description
1	Soil Sample	Topsoil from Pepperell, MA Stockpile 1
1	Soil Sample	Topsoil from Pepperell, MA Stockpile 2

Mr. David Baumgartner
Project Manager
Industri-Plex Site Remedial Trust
41 Atlantic Ave.
Woburn, MA 01801
Phone (617) 932-9599
Fax (617) 932-9589

Remarks: Please run ① Baker Soil Test ② Organic Content

Crop is Turff - No fertilizers have been added

If you have questions call (617) 932-9599

Per Peter Neumann
Resident Engineer

SEND FUTURE INVOICES DIRECTLY TO MY CLIENT

INDUSTRI-PLEX SITE REMEDIAL TRUST
ETER NEUMANN
LANTIC AVE
BURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

PARCELL SPECIFIC #1

LMD INTERPRETATION OF BAKER SOIL TEST™ (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B31	04-27-1995	5485			4.90	5.00	5.30	8.50	0.00

TEST LEVEL		LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC(PPB)	132.24	**********		
Mehlich 3 P (PPM)	95.50	**********		
BAKER SOIL TEST POTASSIUM:				
BST pK	3.74	**********		
BST K (PPM)	8.10	**********		
Exchangeable (ppm)	11.70	*		
Percent Of CEC	0.35	***		
BAKER SOIL TEST MAGNESIUM:				
BST pMg	3.29	**********		
BST Mg (PPM)	22.00	**********		
Exchangeable (PPM)	24.00	*		
Percent of CEC	2.35	*		
SOIL TEST CALCIUM:				
pCa	2.65	**********		
BST Ca (PPM)	160.00	**********		
Exchangeable (PPM)	100.00	*		
Percent of CEC	5.88	*		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/K	4.02	*		
Mg/K	2.10	**********		
Ca/Mg	0.63	**********		
		LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST MANGANESE:				
BST pMn	7.61	**********		
BST Mn (PPM)	6.60	********		
BAKER SOIL TEST IRON:				
BST pFe	18.97	**********		
BST Fe (PPM)	53.00	**********		
BAKER SOIL TEST COPPER:				
BST pCu	14.14	**********		
BST Cu (PPM)	1.30	**********		
BAKER SOIL TEST ZINC:				
BST pZn	11.83	**********		
BST Zn (PPM)	0.70	****		
		LOW	NORMAL OPTIMUM	HIGH

-PLEX SITE REMEDIFILE 831

		LOW	NORMAL OPTIMUM	HIGH
ESSENTIAL ELEMENTS				
BAKER SOIL TEST SODIUM:				
BST Na (PPM)	61.00	**********		
BAKER SOIL TEST ALUMINUM:				
BST Al (PPM)	55.00	**********	**********	**********
BST pAl	10.10	**********	**********	**********
BAKER SOIL TEST LEAD:				
BST Pb (PPM)	0.60	********		
BST pPb	12.17	********		
BAKER SOIL TEST FOR NICKEL:				
BST Ni (PPM)	0.15	*******		
BST pNi	14.40	**********		
BAKER SOIL TEST FOR CADMIUM:				
BST Cd (PPM)	0.10	**********		
BST pCd	12.95	**********	**********	

	LOW	NORMAL OPTIMUM	HIGH

I, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ...ITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

NOTE: SAMPLE ID: TOPSOIL PEPERELL MA STOCKPILE #1
BST Cd <0.1 PPM

ORGANIC CONTENT = 3.2

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=16.00 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS.

APR 27 '95 02:15PM CENTRE ANALYTICAL

TRI-PLEX SITE REMEDIAL TRUST
PETER NEUMANN
ATLANTIC AVE
URN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

MERRIMACK STOCKPILE #2

LMD INTERPRETATION OF BAKER SOIL TEST™ (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B31	04-27-1995	5486			5.70	5.30	5.30	11.10	0.00

TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:			
CALCULATED EPC(PPB) 164.48	**********	**********	
Mehlich 3 P (PPM) 115.00	**********	**********	
BAKER SOIL TEST POTASSIUM:			
BST pK 3.67	**********		
BST K (PPM) 9.50	**********		
Exchangeable (ppm) 27.30	*		
Percent Of CEC 0.63	*******		
BAKER SOIL TEST MAGNESIUM:			
BST pMg 3.29	**********		
BST Mg (PPM) 22.00	**********		
Exchangeable (PPM) 36.00	*****		
Percent of CEC 2.70	*		
BAKER SOIL TEST CALCIUM:			
BST pCa 2.66	**********		
BST Ca (PPM) 158.00	**********		
Exchangeable (PPM) 360.00	*		
Percent of CEC 16.22	*		
BAKER SOIL TEST CATION RATIOS:			
(Ca plus Mg)/H 4.02	*		
Mg/K 2.03	**********		
Ca/Mg 0.63	**********		

	LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST MANGANESE:			
BST pMn 7.67	**********		
BST Mn (PPM) 5.30	*******		
BAKER SOIL TEST IRON:			
BST pFe 18.94	**********		
BST Fe (PPM) 53.00	**********		
BAKER SOIL TEST COPPER:			
BST pCu 13.67	**********		
BST Cu (PPM) 3.60	**********		
BAKER SOIL TEST ZINC:			
BST pZn 10.90	**********		
BST Zn (PPM) 5.60	**********		
	LOW	NORMAL OPTIMUM	HIGH

RI-PLEX SITE REMEDIFILE B31

ESSENTIAL ELEMENTS		LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST SODIUM:				
BST Na (PPM)	59.00	**********		
BAKER SOIL TEST ALUMINUM:				
BST Al (PPM)	57.00	**********	**********	**********
BST pAl	10.05	**********	**********	
BAKER SOIL TEST LEAD:				
BST Pb (PPM)	17.00	**********	**********	
BST pPb	10.69	**********	**********	
BAKER SOIL TEST FOR NICKEL:				
BST Ni (PPM)	0.60	**********		
BST pNi	13.76	**********	**********	
BAKER SOIL TEST FOR CADMIUM:				
BST Cd (PPM)	0.29	**********		
BST pCd	12.46	**********	**********	
		LOW	NORMAL OPTIMUM	HIGH

MG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

NOTE: SAMPLE ID: TOPSOIL PEPERELL MA STOCKPILE #2

ORGANIC CONTENT = 5.0

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=16.04 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS.

INDUSTRI-PLEX SITE REMEDIAL TRUST
ATTN PETER NEUMANN
ATLANTIC AVE
WOBURN MA 01801
PERIMETER SAMPLE #1

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD INTERPRETATION OF BAKER SOIL TEST TM (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B31	04-27-1995	5485			4.90	5.00	5.30	8.50	0.00

TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:			
CALCULATED EPC(PPB) 132.24	**********	**********	
Mehlich 3 P (PPM) 95.50	**********		
BAKER SOIL TEST POTASSIUM:			
BST pK 3.74	**********		
BST K (PPM) 8.10	**********		
Exchangeable (ppm) 11.70	*		
Percent Of CEC 0.35	***		
BAKER SOIL TEST MAGNESIUM:			
BST pMg 3.29	**********		
BST Mg (PPM) 22.00	**********		
Exchangeable (PPM) 24.00	*		
Percent of CEC 2.35	*		
BAKER SOIL TEST CALCIUM:			
BST pCa 2.65	**********		
BST Ca (PPM) 160.00	**********		
Exchangeable (PPM) 100.00	*		
Percent of CEC 5.88	*		
BAKER SOIL TEST CATION RATIOS:			
(Ca plus Mg)/H 4.02	*		
Mg/K 2.10	**********		
Ca/Mg 0.63	**********		

	LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST MANGANESE:			
BST pMn 7.61	**********		
BST Mn (PPM) 6.60	********		
BAKER SOIL TEST IRON:			
BST pFe 18.97	**********		
BST Fe (PPM) 53.00	**********		
BAKER SOIL TEST COPPER:			
BST pCu 14.14	**********		
BST Cu (PPM) 1.30	**********		
BAKER SOIL TEST ZINC:			
BST pZn 11.83	**********		
BST Zn (PPM) 0.70	****		

	LOW	NORMAL OPTIMUM	HIGH

STRI-PLEX SITE REMEDIFILE B31

```
                                                                    NORMAL
                            |----------LOW----------|-------------------OPTIMUM------------------|----------HIGH----------
 ON-ESSENTIAL ELEMENTS      |                       |                                          |
                            |                       |                                          |
 BAKER SOIL TEST SODIUM:    |                       |                                          |
  BST  Na (PPM)       61.00 ****************************                |                        |
                            |                       |                                          |
 BAKER SOIL TEST ALUMINUM:  |                       |                                          |
  BST  Al (PPM)       55.00 ************************************************************************************************
  BST  pAl            10.10 ***************************************************************************.
                            |                       |                                          |
 BAKER SOIL TEST LEAD:      |                       |                                          |
  BST  Pb (PPM)        0.60 ********                |                        |                 |
  BST  pPb            12.17 ********                |                        |                 |
                            |                       |                                          |
 BAKER SOIL TEST FOR NICKEL: |                      |                                          |
  BST  Ni (PPM)        0.15 *******                 |                        |                 |
  BST  pNi            14.40 ***************************                      |                 |
                            |                       |                                          |
 BAKER SOIL TEST FOR CADMIUM: |                     |                                          |
  BST  Cd (PPM)        0.10 ************************|                        |                 |
  BST  pCd            12.95 ************************************************|                 |
                            |                       |                                          |
                            |----------LOW----------|-------------------NORMAL-------------------|----------HIGH---------
                                                                    OPTIMUM
```

PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

OTE: SAMPLE ID: TOPSOIL PEPERELL MA STOCKPILE #1
BST Cd <0.1 PPM
ORGANIC MATTER (TVS) 3.2%

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=16.00 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS.

04/14/95	5485	069971	CENTRE	00	PEP 1	UNSPECIFIED
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR: COPY SENT TO:

LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801 00000

SOIL NUTRIENT LEVELS:

				LOW / OPTIMUM / HIGH / EXCESSIVE
Soil pH		5.0		X
Phosphate	(P_2O_5)	438	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Potash	(K_2O)	28	lb/A	XX
Magnesium	(MgO)	68	lb/A	XXX

RECOMMENDATIONS FOR: *PLANTING TALL FESCUE* (For other crops see ST 2 column: 7) — See Back For Comments

YIELD GOAL 5.0 TONS (PER ACRE) 1,2

LIMESTONE: 9800 lb/A Calcium Carbonate Equivalent 3,4

FOR A 9 - 11" PLOW DEPTH, THE LIMESTONE RECOMMENDATION WAS MULTIPLIED BY 1.5

PLANT NUTRIENT NEEDS:	NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)	
	20 lb/A	0 lb/A	310 lb/A	260 lb/A	5

MESSAGES:

* EXCESSIVE PHOSPHATE AND/OR POTASH LEVEL. 10
* USE A STARTER FERTILIZER (FOR DETAILS, SEE COMMENTS ON BACK--->) 6
* FOR ALFALFA AND BARLEY, THE PH GOAL IS 7.0. FOR ALL OTHER CROPS, THE LIMESTONE RECOMMENDATION, IF ANY, IS TO BRING THE PH TO 6.5. TO ESTIMATE THE LIME REQUIREMENT FOR PH 7.0 FOR THESE CROPS, MULTIPLY THE EXCHANGEABLE ACIDITY BY 1000.
* RECOMMENDED LIMESTONE CONTAINING 2.6% MGO WILL MEET THE MG REQUIREMENT.
* IF MANURE WILL BE APPLIED, SEE ST-10 "USE OF MANURE" 9
* AN ADDITIONAL 30 LB. OF NITROGEN CAN BE APPLIED IN THE LATE SUMMER IF PRODUCTION WARRANTS.
* IN FOLLOWING YEARS, APPLY 40 LBS. OF N PER TON OF YIELD EXPECTED FROM EACH CUTTING. FOR OPTIMUM EFFICIENCY, THE NITROGEN SHOULD BE APPLIED SEPERATELY FOR EACH CUTTING.

LABORATORY RESULTS:

SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		
5.0	191	7.8	0.03	0.2	0.5	8.5	0.3	2.0	5.8

OTHER TESTS:

INDUSTRI-PLEX SITE REMEDIAL TRUST
'N PETER NEUMANN
ATLANTIC AVE
'OBURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

TEPIERLIE STOCKPILE #2

TM

LMD INTERPRETATION OF BAKER SOIL TEST (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B31	04-27-1995	5486			5.70	5.30	5.30	11.10	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC(PPB)	164.48	**********	**********	**********
Mehlich 3 P (PPM)	115.00	**********	**********	
BAKER SOIL TEST POTASSIUM:				
BST pK	3.67	**********		
BST K (PPM)	9.50	**********		
Exchangeable (ppm)	27.30	*		
Percent Of CEC	0.63	*******		
BAKER SOIL TEST MAGNESIUM:				
BST pMg	3.29	**********		
BST Mg (PPM)	22.00	**********		
Exchangeable (PPM)	36.00	*****		
Percent of CEC	2.70	*		
R SOIL TEST CALCIUM:				
pCa	2.66	**********		
ST Ca (PPM)	158.00	**********		
changeable (PPM)	360.00	*		
Percent of CEC	16.22	*		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/H	4.02	*		
Mg/K	2.03	**********		
Ca/Mg	0.63	**********		

		LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST MANGANESE:				
BST pMn	7.67	**********		
BST Mn (PPM)	5.30	*******		
BAKER SOIL TEST IRON:				
BST pFe	18.94	**********		
BST Fe (PPM)	53.00	**********		
BAKER SOIL TEST COPPER:				
BST pCu	13.67	**********		
BST Cu (PPM)	3.60	**********		
ER SOIL TEST ZINC:				
pZn	10.90	**********		
ST Zn (PPM)	5.60	**********		
		LOW	NORMAL OPTIMUM	HIGH

INDUSTRI-PLEX SITE REMEDIFILE 831

```
                                        |----------LOW----------|--------------------NORMAL-------------------|----------HIGH----------|
                                                                                     OPTIMUM
 ON-ESSENTIAL ELEMENTS                  |                       |                                            |                        |
                                        |                       |                                            |                        |
 BAKER SOIL TEST SODIUM:                |                       |                                            |                        |
  BST  Na (PPM)        59.00            ****************************                |                        |                        |
                                        |                       |                                            |                        |
 BAKER SOIL TEST ALUMINUM:              |                       |                                            |                        |
  BST  Al (PPM)        57.00            ******************************************************************************************
  BST  pAl             10.05            ***************************************************************************
                                        |                       |                                            |                        |
 BAKER SOIL TEST LEAD:                  |                       |                                            |                        |
  BST  Pb (PPM)        17.00            *********************************************************          |                        |
  BST  pPb             10.69            *********************************************************          |                        |
                                        |                       |                                            |                        |
 BAKER SOIL TEST FOR NICKEL:            |                       |                                            |                        |
  BST  Ni (PPM)         0.60            *************************                   |                        |                        |
  BST  pNi             13.76            ***********************************         |                        |                        |
                                        |                       |                                            |                        |
 BAKER SOIL TEST FOR CADMIUM:           |                       |                                            |                        |
  BST  Cd (PPM)         0.29            ******************************              |                        |                        |
  BST  pCd             12.46            *********************************************************          |                        |
                                        |                       |                                            |                        |
                                        |----------LOW----------|--------------------NORMAL-------------------|----------HIGH----------
                                                                                     OPTIMUM
```

PK PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

TE: SAMPLE ID: TOPSOIL PEPERELL MA STOCKPILE #2

ORGANIC MATTER (TVS) 5.0 %

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=16.04 DILUTION FACTOR= 1.00

IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS.

04/14/95	5486	069972	CENTRE	00	PEP 2	UNSPECIFIED
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

				LOW / OPTIMUM / HIGH / EXCESSIVE
Soil pH		5.3		X
Phosphate	(P_2O_5)	529	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Potash	(K_2O)	66	lb/A	XXXXX
Magnesium	(MgO)	103	lb/A	XXXX

RECOMMENDATIONS FOR: *PLANTING TALL FESCUE* (For other crops see ST 2 column: 7) — See Back For Comments

YIELD GOAL 5.0 TONS (PER ACRE)

LIMESTONE: *11300* lb/A Calcium Carbonate Equivalent — 1,2 3,4

FOR A 9 - 11" PLOW DEPTH, THE LIMESTONE RECOMMENDATION WAS MULTIPLIED BY 1.5

PLANT NUTRIENT NEEDS:	NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)	
	20 lb/A	*0* lb/A	*320* lb/A	*320* lb/A	6

MESSAGES:

* EXCESSIVE PHOSPHATE AND/OR POTASH LEVEL. 10
* USE A STARTER FERTILIZER (FOR DETAILS, SEE COMMENTS ON BACK--->) 6
* FOR ALFALFA AND BARLEY, THE PH GOAL IS 7.0. FOR ALL OTHER CROPS, THE LIMESTONE RECOMMENDATION, IF ANY, IS TO BRING THE PH TO 6.5. TO ESTIMATE THE LIME REQUIREMENT FOR PH 7.0 FOR THESE CROPS, MULTIPLY THE EXCHANGEABLE ACIDITY BY 1000.
* RECOMMENDED LIMESTONE CONTAINING 2.8% MGO WILL MEET THE MG REQUIREMENT.
* IF MANURE WILL BE APPLIED, SEE ST-10 "USE OF MANURE." 9
* AN ADDITIONAL 30 LB. OF NITROGEN CAN BE APPLIED IN THE LATE SUMMER IF PRODUCTION WARRANTS.
* IN FOLLOWING YEARS, APPLY 40 LBS. OF N PER TON OF YIELD EXPECTED FROM EACH CUTTING. FOR OPTIMUM EFFICIENCY, THE NITROGEN SHOULD BE APPLIED SEPERATELY FOR EACH CUTTING.

LABORATORY RESULTS:

SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		
5.3	230	9.0	0.07	0.3	.1.8	11.1	0.6	2.4	15.7

OTHER TESTS:

APR 27 '95 02:14PM CENTRE ANALYTICAL P.1

INDUSTRI-PLEX SITE REMEDIAL TRUST
PETER NEUMANN
ATLANTIC AVE
BURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

PERKELL SPECIMEN #1

TM

LMD INTERPRETATION OF BAKER SOIL TEST (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B31	04-27-1995	5485			4.90	5.00	5.30	8.50	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC(PPB)	132.24	**********		
Mehlich 3 P (PPM)	95.50	**********		
BAKER SOIL TEST POTASSIUM:				
BST pK	3.74	**********		
BST K (PPM)	8.10	**********		
Exchangeable (ppm)	11.70	*		
Percent Of CEC	0.35	***		
BAKER SOIL TEST MAGNESIUM:				
BST pMg	3.29	**********		
BST Mg (PPM)	22.00	**********		
Exchangeable (PPM)	24.00	*		
Percent of CEC	2.35	*		
BAKER SOIL TEST CALCIUM:				
pCa	2.65	**********		
BST Ca (PPM)	160.00	**********		
Exchangeable (PPM)	100.00	*		
Percent of CEC	5.88	*		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/K	4.02	*		
Mg/K	2.10	**********		
Ca/Mg	0.63	**********		

		LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST MANGANESE:				
BST pMn	7.61	**********		
BST Mn (PPM)	6.60	********		
BAKER SOIL TEST IRON:				
BST pFe	18.97	**********		
BST Fe (PPM)	53.00	**********		
BAKER SOIL TEST COPPER:				
BST pCu	14.14	**********		
BST Cu (PPM)	1.30	**********		
BAKER SOIL TEST ZINC:				
BST pZn	11.83	**********		
BST Zn (PPM)	0.70	****		

	LOW	NORMAL OPTIMUM	HIGH

RI-PLEX SITE REMEDIFILE B31

```
                                                                NORMAL
                                |----------LOW----------|----------------------OPTIMUM----------------------|----------HIGH----------|
   ESSENTIAL ELEMENTS           |                       |                                                |                        |
                                |                       |                                                |                        |
BAKER SOIL TEST SODIUM:         |                       |                                                |                        |
 BST  Na (PPM)        61.00     ***************************                |                                |                        |
                                |                       |                                                |                        |
BAKER SOIL TEST ALUMINUM:       |                       |                                                |                        |
 BST  Al (PPM)        55.00     ************************************************************************************************
 BST  pAl             10.10     ************************************************************************
                                |                       |                                                |                        |
BAKER SOIL TEST LEAD:           |                       |                                                |                        |
 BST  Pb (PPM)         0.60     ********                |                                                |                        |
 BST  pPb             12.17     ********                |                                                |                        |
                                |                       |                                                |                        |
BAKER SOIL TEST FOR NICKEL:     |                       |                                                |                        |
 BST  Ni (PPM)         0.15     *******                 |                                                |                        |
 BST  pNi             14.40     ***************************                |                                |                        |
                                |                       |                                                |                        |
BAKER SOIL TEST FOR CADMIUM:    |                       |                                                |                        |
 BST  Cd (PPM)         0.10     *************************                  |                                |                        |
 BST  pCd             12.95     ********************************************                             |                        |
                                |                       |                                                |                        |
                                |----------LOW----------|----------------------NORMAL----------------------|----------HIGH----------
                                                                                OPTIMUM
```

MG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC
ITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

NOTE: SAMPLE ID: TOPSOIL PEPERELL MA STOCKPILE #1
BST Cd <0.1 PPM

ORGANIC CONTENT=3.2

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=16.00 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS.

APR 27 '95 02:15PM CENTRE ANAL/TICAL

TRI-PLEX SITE REMEDIAL TRUST
PETER NEUMANN
ATLANTIC AVE
URN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

PERIMETER SPREADER #2

TM

LMD INTERPRETATION OF BAKER SOIL TEST (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B31	04-27-1995	5486			5.70	5.30	5.30	11.10	0.00

TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:			
CALCULATED EPC(PPB) 164.48	**********	**********	
Mehlich 3 P (PPM) 115.00	**********	**********	
BAKER SOIL TEST POTASSIUM:			
BST pK 3.67	**********		
BST K (PPM) 9.50	**********		
Exchangeable (ppm) 27.30	*		
Percent Of CEC 0.63	*******		
BAKER SOIL TEST MAGNESIUM:			
BST pMg 3.29	**********		
BST Mg (PPM) 22.00	**********		
Exchangeable (PPM) 36.00	*****		
Percent of CEC 2.70	*		
BAKER SOIL TEST CALCIUM:			
BST pCa 2.66	**********		
BST Ca (PPM) 158.00	**********		
Exchangeable (PPM) 360.00	*		
Percent of CEC 16.22	*		
BAKER SOIL TEST CATION RATIOS:			
(Ca plus Mg)/K 4.02	*		
Mg/K 2.03	**********		
Ca/Mg 0.63	**********		

	LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST MANGANESE:			
BST pMn 7.67	**********		
BST Mn (PPM) 5.30	*******		
BAKER SOIL TEST IRON:			
BST pFe 18.94	**********		
BST Fe (PPM) 53.00	**********		
BAKER SOIL TEST COPPER:			
BST pCu 13.67	**********		
BST Cu (PPM) 3.60	**********		
BAKER SOIL TEST ZINC:			
BST pZn 10.90	**********		
BST Zn (PPM) 5.60	**********		
	LOW	NORMAL OPTIMUM	HIGH

TRI-PLEX SITE REMEDIFILE 831

ESSENTIAL ELEMENTS		LOW	NORMAL OPTIMUM	HIGH
BAKER SOIL TEST SODIUM:				
BST Na (PPM)	59.00	**********		
BAKER SOIL TEST ALUMINUM:				
BST Al (PPM)	57.00	**********	**********	**********
BST pAl	10.05	**********	**********	**********
BAKER SOIL TEST LEAD:				
BST Pb (PPM)	17.00	**********	**********	
BST pPb	10.69	**********	**********	
BAKER SOIL TEST FOR NICKEL:				
BST Ni (PPM)	0.60	**********		
BST pNi	13.76	**********	**********	
BAKER SOIL TEST FOR CADMIUM:				
BST Cd (PPM)	0.29	**********		
BST pCd	12.46	**********	**********	
		LOW	NORMAL OPTIMUM	HIGH

PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

NOTE: SAMPLE ID: TOPSOIL PEPERELL MA STOCKPILE #2

ORGANIC CONTENT = 5.0

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=16.04 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS.

Golder Associates Inc.

400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To: Land Management Decisions Inc.
Baker Soil Test
3048 Research Drive
State College, PA 16801
Attn: Dr. Baker or Senef

Date: 3/24/95
Project No.: 933-6142

Sent by:

- [ ] Mail
- [ ] Courier
- [ ] Hand Carried
- [ ] Under Separate Cover
- [x] Federal Express
- [ ] Enclosed

Quantity	Item	Description
1	Soil Sample	From Littleton, MA
1	Form	Page 4 of Penn State University Soil Test

Remarks: Please run ① Baker Soil Test
② Organic Content
Crop is Turff No fertilizers have been added
If you have any questions call (617) 932-9599

Per Peter Neumann
Resident Engineer

PENNSYLVANIA STATE UNIVERSITY

MERKLE LABORATORY COLLEGE OF AGRICULTURE • UNIVERSITY PARK, PENNSYLVANIA 16802

CODE NO. TO BE FILLED IN BY SPECIALIST (7–15)

PLEASE PRINT 3-LINE ADDRESS (AREA CODE – TELEPHONE NO.)

PLEASE PRINT 3 - LINE ADDRESS (DO NOT WRITE IN ABOVE BLOCKS)

3 LABORATORY NO. 6

27885

SERIAL NO. 12

NAME 19–38: Industri-Plex Site

COMMERCIAL FIRM (OR REPRESENTATIVE) 19–38: Attn: Peter Neumann

STREET OR RD. NO. 39–57: 41 Atlantic Ave.

CITY AND STATE 58–75: Woburn, MA ~~01801~~

ZIP 76–80: 01801

DATE 13–18

USE THIS SIDE FOR TURF, HOME GARDEN, ORNAMENTAL, FLOWER, FRUIT, FORESTRY & MUSHROOM SOILS

USE PAGE 3 FOR AGRONOMIC, COMMERCIAL FRUIT, COMMERCIAL VEGETABLE SOILS

COUNTY WHERE FIELD OR AREA IS LOCATED: Middlesex, MA (7–8)

FIELD NO. OR LETTER (NO MORE THAN 6 DIGITS) 9–14

— READ —

COMPLETE SECTION 2 FOR CROP AREAS INDICATED IN RED ABOVE. FOR TURF CROPS ALSO COMPLETE SECTIONS 1 AND 3. FOR ALL HOME OWNER, FORESTRY AND MUSHROOM CROPS - COMPLETE SECTION 2 ONLY. FOR ORNAMENTALS, ALSO COMPLETE SECTION 1 INDICATING MAINTENANCE OR ESTABLISHMENT.

— SECTION 1 —

RECOMMENDATION WANTED (CHECK ONE ONLY)

- [ ] (1) FOR MAINTENANCE
- [x] (2) FOR ESTABLISHMENT, TO BE SEEDED OR PLANTED IN THE (19)

MONTH OF: Spring 1995 (20–22: 0)

HEIGHT MOWER IS SET TO CUT (CHECK ONE ONLY)

- [ ] (1) LESS THAN 1½ INCHES
- [x] (2) 1½ INCHES OR HIGHER (57)

PURCHASE PRICE COVERS COST OF REGULAR ANALYSIS + REPORT

— SECTION 2 —

DO NOT GIVE MORE THAN ONE CROP CODE OR CROP GROUP CODE OR NAME.

Please refer to PAGE 5 and 6, locate crop name and place code number in the 3 blocks below. For ornamentals refer to PAGE 6 and place crop group code in 3 blocks below.

CROP CODE (58–60): 2 1 2 — COPY ALL 3 DIGITS

WRITE CROP NAME OR CROP GROUP: Sod Production

IF LIME WAS APPLIED IN PAST 12 MONTHS INDICATE THE AMOUNT HERE: _____ LBS./1000 SQ. FT.

— SECTION 3 —

PREDOMINANT GRASS SPECIES (CHECK ONE ONLY)

- [ ] (1) MERION BLUEGRASS
- [ ] (2) OTHER KENTUCKY BLUEGRASS VARIETIES
- [ ] (3) BENTGRASS
- [ ] (4) RED FESCUE
- [x] (5) TALL FESCUE 73%
- [ ] (6) ZOYSIA
- [ ] (7) BERMUDA
- [ ] (8) ANNUAL BLUEGRASS (POA ANNUAL) 27% Perennial Rye Grass (63)

✓ ~~Other See Attached Sheet~~

FOR SPECIFIC PROBLEMS OTHER THAN SOIL FERTILITY IN TURF, HOME GARDEN, ORNAMENTAL, FLOWER, FRUIT, FORESTRY AND MUSHROOM SOIL AREAS, WRITE TO YOUR COUNTY AGENT

04/03/95	1034	027888	CENTRE	00	LITTLE	UNSPECIFIED
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:
LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

				LOW / OPTIMUM / HIGH / EXCESSIVE
Soil pH		5.9		XXXXXXXXX
Phosphate	(P_2O_5)	826	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Potash	(K_2O)	94	lb/A	XXXXXXXXXXXX
Magnesium	(MgO)	149	lb/A	XXXXXXXXX

RECOMMENDATIONS FOR: *TOPDRESS TALL FESCUE* (For other crops see ST 2 column: 7)

See Back For Commen

YIELD GOAL 4.0 TONS (PER ACRE)

LIMESTONE: *2000* lb/A Calcium Carbonate Equivalent 1,2 3,4

*
*

PLANT NUTRIENT NEEDS:	NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)	
	@@@ lb/A	*0* lb/A	*200* lb/A	*90* lb/A	5

MESSAGES:

* EXCESSIVE PHOSPHATE AND/OR POTASH LEVEL. 10

* FOR ALFALFA AND BARLEY, THE PH GOAL IS 7.0. FOR ALL OTHER CROPS, THE LIMESTONE RECOMMENDATION, IF ANY, IS TO BRING THE PH TO 6.5. TO ESTIMATE THE LIME REQUIREMENT FOR PH 7.0 FOR THESE CROPS, MULTIPLY THE EXCHANGEABLE ACIDITY BY 1000.

* RECOMMENDED LIMESTONE CONTAINING 4.5% MGO WILL MEET THE MG REQUIREMENT.

* IF MANURE WILL BE APPLIED, SEE ST-10 "USE OF MANURE". 9

@@@ NITROGEN RECOMMENDATION :
APPLY 40 LBS OF N PER TON OF YIELD EXPECTED FROM EACH CUTTING. FOR OPTIMUM EFFICIENCY, THE NITROGEN SHOULD BE APPLIED SEPERATELY FOR EACH CUTTING. ANY RECOMMENDED PHOSPHATE OR POTASH SHOULD BE APPLIED WITH THE NITROGEN AFTER ONE OF THE CUTTINGS.
-OR- FOR FALL STOCKPILING, APPLY 1/3 OF THE NITROGEN IN EARLY SPRING AND 2/3 OF THE NITROGEN PLUS THE RECOMMENDED PHOSPHATE AND POTASH IN EARLY AUGUST.

LABORATORY RESULTS:

5.9	359	2.7	0.10	0.4	3.0	6.2	1.6	6.2	48.3
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

GOLDER ASSOCIATES INC
ATTN PETER NEUMANN
ATLANTIC AVE
OBURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD INTERPRETATION OF BAKER SOIL TEST™ (BST) DATA.
THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
830	04-13-1995	1034			1.00	5.90	6.05	6.20	0.00

TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:			
CALCULATED EPC (PPB) 274.14	**********	**********	**********
Mehlich 3 P (PPM) 179.50	**********	**********	**********
BAKER SOIL TEST POTASSIUM:			
BST pK 3.65	**********		
BST K (PPM) 10.10	**********		
Exchangeable (ppm) 39.00	*		
Percent Of CEC 1.61	**********		
BAKER SOIL TEST MAGNESIUM:			
BST pMg 3.31	**********		
BST Mg (PPM) 20.70	**********		
Exchangeable (PPM) 48.00	********		
Percent of CEC 6.45	**********		
BAKER SOIL TEST CALCIUM:			
BST pCa 2.66	**********		
BST Ca (PPM) 160.00	**********		
Exchangeable (PPM) 600.00	******		
Percent of CEC 48.39	**********		
BAKER SOIL TEST CATION RATIOS:			
(Ca plus Mg)/H 4.77	**********		
Ca/K 1.99	**********		
Ca/Mg 0.66	**********		

	LOW	AVERAGE (BACKGROUND)	MAX FOR CROPS	MAX FOR RECLAMATION
BAKER SOIL TEST (BST) MANGANESE:				
BST pMn 7.55	**********	**********	**********	
BST Mn (PPM) 28.00	**********	**********	**********	
BST pFe 19.45	**********	**********	**********	
BAKER SOIL TEST IRON:				
BST Fe (PPM) 71.00	**********	**********	**********	**********
BAKER SOIL TEST COPPER:				
BST pCu 14.65	**********	**********	**********	
BST Cu (PPM) 1.10	**********	**********	**********	
BAKER SOIL TEST ZINC:				
BST pZn 11.07	**********	**********	**********	
BST Zn (PPM) 5.50	**********	**********	**********	

	LOW	AVERAGE (BACKGROUND)	MAX FOR CROPS	MAX FOR RECLAMATION

```
CRUDER ASSOCIATES INC    FILE 830
                         |----------LOW-------AVERAGE------------MAX FOR | CROPS---------MAX FOR | RECLAMATION------------
    NON-ESSENTIAL ELEMENTS |                   BACKGROUND
                         |                    |                    |                    |
 BAKER SOIL TEST FOR SODIUM:                  |                    |                    |
   Na (PPM)          15.60 ********          |                    |                    |
                         |                    |                    |                    |
 BAKER SOIL TEST FOR ALUMINUM:                |                    |                    |
   Al (PPM)          34.00 ******************************************************************************************
   pAl               10.87 ************************************************************
                         |                    |                    |                    |
 BAKER SOIL TEST FOR LEAD:                    |                    |                    |
   Pb (PPM)           3.00 ***************************
   pPb               11.98 ***************************
                         |                    |                    |                    |
 BAKER SOIL TEST FOR NICKEL:                  |                    |                    |
   Ni (PPM)           0.50 ************************
   pNi               13.98 ********************************
                         |                    |                    |                    |
 BAKER SOIL TEST FOR CADMIUM:                 |                    |                    |
   Cd (PPM)           0.10 ************************
   pCd               13.52 ************************************
                         |                    |                    |                    |
                         |----------LOW-------AVERAGE------------MAX FOR | CROPS---------MAX FOR | RECLAMATION------------
                                              BACKGROUND
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

NOTE: SAMPLE ID: LITTLETON MA
BST Cd <0.1 PPM
VOLATILE SOLIDS 3.5% (APPROXIMATE ORGANIC MATTER)

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.39 DILUTION FACTOR= 1.00
IF pLIGAND IS GREATER THAN 15.5, THE pMETALS WILL BE HIGH, AND RESULTS FOR METALS WILL BE LOW. ACCURATE RESULTS CAN BE OBTAINED FOR HIGH METAL SOILS BY TESTING HALF AS MUCH SOIL AND INCLUDE A DILUTION FACTOR OF 2 FOR CALCULATIONS OF RESULTS.

-ies INC
ATTN PETER NEUMANN
41 ATLANTIC AVE
WOBURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD INTERPRETATION OF BAKER SOIL TEST™ (BST) DATA.
THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

FICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
	04-13-1995	1034			1.00	5.90	6.05	6.20	0.00

TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:			
CALCULATED EPC (PPB) 274.14	**********	**********	**********
Mehlich 3 P (PPM) 179.50	**********	**********	**********
AKER SOIL TEST POTASSIUM:			
BST pK 3.65	**********		
BST K (PPM) 10.10	**********		
changeable (ppm) 39.00	*		
rcent Of CEC 1.61	**********		
KER SOIL TEST MAGNESIUM:			
T pMg 3.31	**********		
T Mg (PPM) 20.70	**********		
hangeable (PPM) 48.00	********		
cent of CEC 6.45	**********		
R SOIL TEST CALCIUM:			
pCa 2.66	**********		
Ca (PPM) 160.00	**********		
ngeable (PPM) 600.00	******		
nt of CEC 48.39	**********		
SOIL TEST CATION RATIOS:			
plus Mg)/H 4.77	**********		
1.99	**********		
g 0.66	**********		
	LOW / AVERAGE BACKGROUND	MAX FOR CROPS	MAX FOR RECLAMATION
SOIL TEST (BST) MANGANESE:			
7.55	**********		
PM) 28.00	**********		
19.45	**********		
IL TEST IRON: (PPM) 71.00	**********		
L TEST COPPER: 14.65	**********		
PPM) 1.10	**********		
TEST ZINC: 11.07	**********		
PM) 5.50	**********		
	LOW / AVERAGE BACKGROUND	MAX FOR CROPS	MAX FOR RECLAMATION

Golder Associates Inc.

400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To Land Management Decisions Inc.
Baker Soil Test
3048 Research Drive
State College, PA 16801
Attention: Dr. Sertet

Date: 12/21/94
Project No.: 933-6142

Sent by:

- [ ] Mail
- [ ] Courier
- [ ] Hand Carried
- [ ] Under Separate Cover
- [x] Federal Express
- [ ] Enclosed

Quantity	Item	Description
1	Soil Sample #1	From South Side of East Hide Pile. Directly South of Last Two Vaults AA + CC.
1	Soil Sample #2	From West side of East Hide Pile. Directly West of Last Vault CC. (Both sampled 12/21/94)
1	Form	Page 4 of Penn State University Soil Test.
1	Letter	Coastal Environmental Inc. 09/30/94

Remarks: Please Run
- Baker Soil Test for Each Sample
- Organic Content for Each sample

Crop is Turf No Additives (fertilizer) have been added.

If there are any questions call (617) 932-9599

Per Arthur A. Toney

THE PENNSYLVANIA S[illegible] UNIVERSITY

MERKLE LABORATORY COLLEGE OF AGRICULTURE • UNI[illegible]SITY PARK, PENNSYLVANIA 16802

CODE NO. TO BE FILL[illegible] [illegible]PECIALIST

PLEASE PRINT 3 LINE ADDRESS (DO NOT WRITE IN ABOVE BLOCKS)

AREA CODE: 617 TELEPHONE NO: 932-5595

3 LABORATORY NO. 6: 27887

7 SERIAL NO. 12

13 DATE 18: 12/21/94

19 NAME 38:

39 STREET OR RD. NO. 57:

58 CITY AND STATE 75 76 ZIP 80:

19 COMMERCIAL FIRM (OR REPRESENTATIVE) 38: Industri Plex Site ATTN: Peter Newman

39 STREET OR RD. NO. 57: 41 Atlantic Ave.

58 CITY AND STATE 75 76 ZIP 80: Woburn, MA 01801

USE THIS SIDE FOR TURF, HOME GARDEN, ORNAMENTAL, FLOWER, FRUIT, FORESTRY & MUSHROOM SOILS

USE PAGE 3 FOR AGRONOMIC, COMMERCIAL FRUIT, COMMERCIAL VEGETABLE SOILS

COUNTY WHERE FIELD OR AREA IS LOCATED: Middlesex, MA (7)

FIELD NO OR LETTER (NO MORE THAN 6 DIGITS) (8 9 – 14)

— READ —

COMPLETE SECTION 2 FOR CROP AREAS INDICATED IN RED ABOVE. FOR TURF CROPS ALSO COMPLETE SECTIONS 1 AND 3. FOR ALL HOME OWNER, FORESTRY AND MUSHROOM CROPS - COMPLETE SECTION 2 ONLY. FOR ORNAMENTALS, ALSO COMPLETE SECTION 1 INDICATING MAINTENANCE OR ESTABLISHMENT.

— SECTION 1 —

RECOMMENDATION WANTED (CHECK ONE ONLY)

19
- [ ] (1) FOR MAINTENANCE
- [x] (2) FOR ESTABLISHMENT, TO BE SEEDED OR PLANTED IN THE

MONTH OF: Spring 1995

20 21 22: 0

HEIGHT MOWER IS SET TO CUT (CHECK ONE ONLY)

57
- [ ] (1) LESS THAN 1½ INCHES
- [x] (2) 1½ INCHES OR HIGHER

PURCHASE PRICE COVERS COST OF REGULAR ANALYSIS + REPORT

— SECTION 2 —

DO NOT GIVE MORE THAN ONE CROP CODE OR CROP GROUP CODE OR NAME.

Please refer to PAGE 5 and 6, locate crop name and place code number in the 3 blocks below. For ornamentals refer to PAGE 6 and place crop group code in 3 blocks below.

58 59 60: 2 1 2 CROP CODE COPY ALL 3 DIGITS

WRITE CROP NAME OR CROP GROUP: Sod Production

IF LIME WAS APPLIED IN PAST 12 MONTHS INDICATE THE AMOUNT HERE: [illegible] LBS./1000 SQ. FT.

— SECTION 3 —

PREDOMINANT GRASS SPECIES (CHECK ONE ONLY)

63
- [ ] (1) MERION BLUEGRASS
- [ ] (2) OTHER KENTUCKY BLUEGRASS VARIETIES
- [ ] (3) BENTGRASS
- [ ] (4) RED FESCUE
- [ ] (5) TALL FESCUE
- [ ] (6) ZOYSIA
- [ ] (7) BERMUDA
- [ ] (8) ANNUAL BLUEGRASS (POA ANNUAL)
- [x] other: See Attached Coastal Environmental Service letter 09/30/94.

FOR SPECIFIC PROBLEMS OTHER THAN SOIL FERTILITY IN TURF, HOME GARDEN, ORNAMENTAL, FLOWER, FRUIT, FORESTRY AND MUSHROOM SO[illegible] AREAS WRITE TO YOUR COUNTY AGENT

Send this copy to laboratory with sample — PAGE 4 — Your report cannot be completed without it

COASTAL
ENVIRONMENTAL SERVICES INC.

30 September 1994

Ms. Kelly Fagan
Rust Remedial Services, Inc.
41 Atlantic Avenue
Woburn, MA 01801

Re: Additional seed for uplands
Industri-Plex
Woburn, MA

Dear Ms. Fagan:

Pursuant to your recent request, Coastal Environmental Services, Inc. (Coastal) has developed a list of additional upland seed for use this fall. The additional seed contains a variety of cool and warm season grasses as well as seed for a nurse crop. The mix also includes a native legume, partridge pea. The mix includes the following:

Species		Rate/Acre
Annual rye	(*Lolium multiflorum*)	15
Oats	(*Avena sativa*)	2 bushels
Red top	(*Agrostis alba*)	8
Big bluestem-Niagra	(*Andropogon gerardii*)	4
Indian grass	(*Sorgastrum nutans*)	2
Partridge pea*	(*Cassia fasiculata*)	2

* The use of partridge pea in the Fall seed mix may be difficult due to the lack of availability at this time and should be limited to use in the Spring.

The warm season grasses used in this mix, big bluestem and Indian grass, are frequently used to establish cover on heavily disturbed or barren sites such as in mine reclamation. The oats and annual rye were included to provide quick cover and to stabilize the soil until the other grasses, primarily the warm season grasses, can become established. Red top is a cool season grass that should develop this fall, but does not grow as quickly as the oats or annual rye. This mix is designed to use as an addition to

2 RESEARCH WAY, PRINCETON NJ 08540 • TEL (609) 987-0966 • FAX (609) 987-2443
WITH OFFICES IN BALTIMORE, MD AND ST. PETERSBURG, FL

the permanent mix set forth in the specification.

I have included the addresses of sources for the proposed seed mix as an attachment.

Coastal reviewed the laboratory data for the topsoil to be utilized as the final cover in the remediated uplands and suggests that if lime is to be included in the hydroseeding mix the rate should be less than 2.5 tons per acre. Rates greater than 2.5 tons per acre can affect seed germination. If you have any questions or comments, do not hesitate to call.

Sincerely,

Mark Gallagher
Senior Scientist

gallagher20/Fagan.ltr

GOLDER ASSOCIATES INC
N PETER NEUMANN
COMMERCIAL ST
MANCHESTER NH 03101

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

TM

LMD INTERPRETATION OF BAKER SOIL TEST (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B28	01-11-1995	7760			1.70	5.70	5.75	7.70	0.13

TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:			
CALCULATED EPC (PPB) 132.24	**********	**********	
Mehlich 3 P (PPM) 95.50	**********	**********	
POTASSIUM:			
BST pK 3.59	**********		
BST K (PPM) 11.50	**********		
Exchangeable (ppm) 46.80	*****		
Percent Of CEC 1.56	**********		
MAGNESIUM:			
BST pMg 3.20	**********		
BST Mg (PPM) 26.90	**********		
Exchangeable (PPM) 60.00	**********		
Percent of CEC 6.49	**********		
CALCIUM:			
pCa 2.81	*		
BST Ca (PPM) 109.00	**********		
Exchangeable (PPM) 600.00	******		
Percent of CEC 38.96	********		
BAKER SOIL TEST CATION RATIOS:			
(Ca plus Mg)/H 4.42	**********		
Mg/K 1.99	**********		
Ca/Mg 0.38	**********		
	LOW	NORMAL	
BAKER SOIL TEST (BST) MANGANESE:			
BST pMn 6.98	**********	**********	
BST Mn (PPM) 33.00	**********		
BST pFe 18.56	**********	**********	
BAKER SOIL TEST IRON:			
BST Fe (PPM) 171.00	**********	**********	**********
BAKER SOIL TEST COPPER:			
BST pCu 14.92	**********		
BST Cu (PPM) 0.20	**		
BAKER SOIL TEST ZINC:			
BST pZn 11.18	**********		
BST Zn (PPM) 1.90	**********		
	LOW	NORMAL	HIGH

GOLDER ASSOCIATES INC FILE B28

```
                                |----------LOW----------|---------------------NORMAL-------------------|----------HIGH---------
  N-ESSENTIAL ELEMENTS          |                       |                                            |
                                |                       |                                            |
 AKER SOIL TEST FOR SODIUM:     |                       |                                            |
   Na (PPM)            11.00    ******                  |                                            |
                                |                       |                                            |
 BAKER SOIL TEST FOR ALUMINUM:  |                       |                                            |
   Al (PPM)            18.30    ***************************************************************      |
   pAl                 10.64    **************************************************************       |
                                |                       |                                            |
 BAKER SOIL TEST FOR LEAD:      |                       |                                            |
   Pb (PPM)             0.30    ****                    |                                            |
   pPb                 12.49    ****                    |                                            |
                                |                       |                                            |
 BAKER SOIL TEST FOR NICKEL:    |                       |                                            |
   Ni (PPM)             0.36    ******************      |                                            |
   pNi                 13.78    **********************************                                   |
                                |                       |                                            |
 BAKER SOIL TEST FOR CADMIUM:   |                       |                                            |
   Cd (PPM)             0.10    *************************|                                           |
   pCd                 13.02    ***********************************************                      |
                                |                       |                                            |
                                |----------LOW----------|---------------------NORMAL-------------------|----------HIGH---------
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

E: SAMPLE ID: #1
BST Cd <0.1 PPM Pb <0.3 PPM
TOTAL ORGANIC CARBON 3400 MG/KG

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.92 DILUTION FACTOR= 1.00

DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL
01/05/95	7760	027887	CENTRE	00	1	UNSPECIFIED

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

				LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH		5.7		XXXXXXXXX			
Phosphate	(P_2O_5)	438	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Potash	(K_2O)	112	lb/A	XXXXXXXXXXX			
Magnesium	(MgO)	184	lb/A	XXXXXXXXXXXXXXXX			

RECOMMENDATIONS FOR: *DISTURBED LANDS* (For other crops see ST 2 column: 7)

See Back For Comments

YIELD GOAL N/A

LIMESTONE: 3400 lb/A Calcium Carbonate Equivalent 1 3,4

*
*

PLANT NUTRIENT NEEDS:

NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)
120 lb/A	0 lb/A	150 lb/A	0 lb/A

MESSAGES:

* EXCESSIVE PHOSPHATE AND/OR POTASH LEVEL. 10
* USE A STARTER FERTILIZER (FOR DETAILS, SEE COMMENTS ON BACK--->) 6
* IF MANURE WILL BE APPLIED, SEE ST-10 "USE OF MANURE" 9
* 80 LB OF THE NITROGEN APPLICATION SHOULD BE FROM A SLOW-RELEASE SOURCE.
* WHEN AVAILABLE, APPLY 20 OR MORE TONS OF CATTLE MANURE PER ACRE AND WORK IN AS AS DEEPLY AS POSSIBLE. IF MANURE IS APPLIED, IT WILL REPLACE THE REQUIREMENT FOR 80 LB OF SLOW-RELEASE NITROGEN.
* SOLUBLE SALTS LEVEL (SEE BELOW) IS LOW

LABORATORY RESULTS:

SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		
5.7	191	4.1	0.12	0.5	3.0	7.7	1.5	6.2	38.9

OTHER TESTS:

SOLUBLE SALTS - 0.13 MMHOS/CM.

GOLDER ASSOCIATES INC
TN PETER NEUMANN
/ COMMERCIAL ST
1ANCHESTER NH 03101

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

TM

LMD INTERPRETATION OF BAKER SOIL TEST (BST) DATA.

THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B29	01-11-1995	7759			1.70	5.70	5.58	7.10	0.12

TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:			
CALCULATED EPC (PPB) 151.20	**********	**********	
Mehlich 3 P (PPM) 107.00	**********	**********	
POTASSIUM:			
BST pK 3.67	**********		
BST K (PPM) 9.60	**********		
Exchangeable (ppm) 42.90	***		
Percent Of CEC 1.55	**********		
MAGNESIUM:			
BST pMg 3.28	**********		
BST Mg (PPM) 22.10	**********		
Exchangeable (PPM) 48.00	********		
Percent of CEC 5.63	**********		
CIUM:			
pCa 2.90	*		
T Ca (PPM) 92.00	**********		
Xchangeable (PPM) 500.00	***		
Percent of CEC 35.21	*****		
BAKER SOIL TEST CATION RATIOS:			
(Ca plus Mg)/H 4.21	*****		
Mg/K 2.03	**********		
Ca/Mg 0.39	**********		
BAKER SOIL TEST (BST) MANGANESE:			
BST pMn 7.37	**********		
BST Mn (PPM) 23.00	**********		
BST pFe 18.81	**********		
BAKER SOIL TEST IRON:			
BST Fe (PPM) 163.00	**********	**********	
BAKER SOIL TEST COPPER:			
BST pCu 15.01	**********		
BST Cu (PPM) 0.30	****		
BAKER SOIL TEST ZINC:			
BST pZn 11.40	**********		
Zn (PPM) 2.50	**********		

GOLDER ASSOCIATES INC FILE B29

```
                                  |----------LOW----------|--------------------NORMAL--------------------|----------HIGH---------
 I-ESSENTIAL ELEMENTS             |                       |                                            |
                                  |                       |                                            |
 AKER SOIL TEST FOR SODIUM:       |                       |                                            |
  Na (PPM)            8.00        ****                    |                                            |
                                  |                       |                                            |
BAKER SOIL TEST FOR ALUMINUM:     |                       |                                            |
  Al (PPM)           11.60        ********************************************                         |
  pAl                11.08        ************************************************************         |
                                  |                       |                                            |
BAKER SOIL TEST FOR LEAD:         |                       |                                            |
  Pb (PPM)            0.30        ****                    |                                            |
  pPb                12.75        ****                    |                                            |
                                  |                       |                                            |
BAKER SOIL TEST FOR NICKEL:       |                       |                                            |
  Ni (PPM)            0.17        *********               |                                            |
  pNi                14.45        *************************                                            |
                                  |                       |                                            |
BAKER SOIL TEST FOR CADMIUM:      |                       |                                            |
  Cd (PPM)            0.10        *************************|                                            |
  pCd                13.26        ****************************************                             |
                                  |                       |                                            |
                                  |----------LOW----------|--------------------NORMAL--------------------|----------HIGH---------
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

E: SAMPLE ID: #2
BST Cd <0.1 PPM Pb < 0.3 PPM
TOTAL ORGANIC CARBON 1750 MG/KG

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.69 DILUTION FACTOR= 1.00

01/05/95	7759	027886	CENTRE	00	2	UNSPECIFIED
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

		Value	Unit	LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH		5.7		XXXXXXXXX			
Phosphate	(P_2O_5)	492	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
Potash	(K_2O)	103	lb/A	XXXXXXXXXXX			
Magnesium	(MgO)	149	lb/A	XXXXXXXXXXXXXXX			

RECOMMENDATIONS FOR: *DISTURBED LANDS* (For other crops see ST 2 column: 7)

See Back For Comments

YIELD GOAL N/A

LIMESTONE: *3400* lb/A Calcium Carbonate Equivalent — 1, 3,4

*
*

PLANT NUTRIENT NEEDS:

NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	MAGNESIUM (MgO)
120 lb/A	*0* lb/A	*150* lb/A	*0* lb/A

MESSAGES:

* EXCESSIVE PHOSPHATE AND/OR POTASH LEVEL. 10
* USE A STARTER FERTILIZER (FOR DETAILS, SEE COMMENTS ON BACK--->) 6
* IF MANURE WILL BE APPLIED, SEE ST-10 "USE OF MANURE" 9
* 80 LB OF THE NITROGEN APPLICATION SHOULD BE FROM A SLOW-RELEASE SOURCE.
* WHEN AVAILABLE, APPLY 20 OR MORE TONS OF CATTLE MANURE PER ACRE AND WORK IN AS AS DEEPLY AS POSSIBLE. IF MANURE IS APPLIED, IT WILL REPLACE THE REQUIREMENT FOR 80 LB OF SLOW-RELEASE NITROGEN.
* SOLUBLE SALTS LEVEL (SEE BELOW) IS LOW

LABORATORY RESULTS:

5.7	214	4.1	0.11	0.4	2.5	7.1	1.5	5.4	35.2
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

SOLUBLE SALTS - 0.12 MMHOS/CM.

SOIL01 AGRONOMIC

Golder Associates Inc.

400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To: LAND MANAGEMENT DECISIONS INC.
BAKER SOIL TEST (TM)
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

ATTENTION: DR. SENET

Date: 10/12/94
Project No.: 933-6142

Sent by:

- [ ] Mail
- [ ] Courier
- [ ] Hand Carried
- [ ] Under Separate Cover
- [x] Federal Express
- [ ] Enclosed

Quantity	Item	Description
1	SOIL SAMPLE #1	FROM EAST SIDE OF WEST HIDE PILE
1	SOIL SAMPLE #2	From NORTH EAST SIDE OF WEST HIDE PILE
		Both sampled on 10/11/94
1	Form	Page 4 of Penn State Univ. Soil Test.
1	Letter	Coastal Environmental Inc., Sept. 30, 1994.

Remarks: Please run BAKER SOIL TEST FOR EACH
ORGANIC CONTENT
Crop is turf. Both nitrogen & fertilizer and lime have been added
If there are any questions - call (617) 932-9599

Per Peter Neumann

THE PENNSYLVANIA STATE UNIVERSITY

MERKLE LABORATORY COLLEGE OF AGRICULTURE • UNIVERSITY PARK, PENNSYLVANIA 16802

PLEASE PRINT 3-LINE ADDRESS — AREA CODE 617 — TELEPHONE NO. 132-9599

PLEASE PRINT 3-LINE ADDRESS (DO NOT WRITE IN ABOVE BLOCKS)

3 - LABORATORY NO. 8

NAME:

COMMERCIAL FIRM (OR REPRESENTATIVE): INDUSTRI-PLEX SITE ATTN: PETER NEUMANN

SERIAL NO. 12

STREET OR RD. NO.:

STREET OR RD. NO.: 41 Atlantic Ave.

DATE: 10/17/94

CITY AND STATE:

CITY AND STATE: Woburn MA ZIP: 01801

USE THIS SIDE FOR TURF, HOME GARDEN, ORNAMENTAL, FLOWER, FRUIT, FORESTRY & MUSHROOM SOILS

USE PAGE 3 FOR AGRONOMIC, COMMERCIAL FRUIT, COMMERCIAL VEGETABLE SOILS

COUNTY WHERE FIELD OR AREA IS LOCATED: MIDDLESEX, MA

FIELD NO. OR LETTER (NO MORE THAN 6 DIGITS)

— READ —

COMPLETE SECTION 2 FOR CROP AREAS INDICATED IN RED ABOVE. FOR TURF CROPS ALSO COMPLETE SECTIONS 1 AND 3. FOR ALL HOME OWNER, FORESTRY AND MUSHROOM CROPS - COMPLETE SECTION 2 ONLY. FOR ORNAMENTALS, ALSO COMPLETE SECTION 1 INDICATING MAINTENANCE OR ESTABLISHMENT.

— SECTION 2 —

DO NOT GIVE MORE THAN ONE CROP CODE OR CROP GROUP CODE OR NAME.

Please refer to PAGE 5 and 6, locate crop name and place code number in the 3 blocks below. For ornamentals refer to PAGE 6 and place crop group code in 3 blocks below.

2 1 2 CROP CODE COPY ALL 3 DIGITS

WRITE CROP NAME OR CROP GROUP Sod Production

IF LIME WAS APPLIED IN PAST 12 MONTHS INDICATE THE AMOUNT HERE: 115 LBS./1000 SQ. FT.

— SECTION 1 —

RECOMMENDATION WANTED (CHECK ONE ONLY)

- [ ] (1) FOR MAINTENANCE
- [x] (2) FOR ESTABLISHMENT, TO BE SEEDED OR PLANTED IN THE MONTH OF: October

HEIGHT MOWER IS SET TO CUT (CHECK ONE ONLY)

- [ ] (1) LESS THAN 1½ INCHES
- [x] (2) 1½ INCHES OR HIGHER

PURCHASE PRICE COVERS COST OF REGULAR ANALYSIS + REPORT

— SECTION 3 —

PREDOMINANT GRASS SPECIES (CHECK ONE ONLY)

- [ ] (1) MERION BLUEGRASS
- [ ] (2) OTHER KENTUCKY BLUEGRASS VARIETIES
- [ ] (3) BENTGRASS
- [ ] (4) RED FESCUE
- [ ] (5) TALL FESCUE
- [ ] (6) ZOYSIA
- [ ] (7) BERMUDA
- [ ] (8) ANNUAL BLUEGRASS (POA ANNUAL)
- [x] Other

See Attached Coastal Environmental Service letter 9/30/94

FOR SPECIFIC PROBLEMS OTHER THAN SOIL FERTILITY IN TURF, HOME GARDEN, ORNAMENTAL, FLOWER, FRUIT, FORESTRY AND MUSHROOM SOIL AREAS, WRITE TO YOUR COUNTY AGENT

d this copy to laboratory with sample—PAG 1 Your report cannot be completed without it

COASTAL
ENVIRONMENTAL SERVICES INC.

30 September 1994

Ms. Kelly Fagan
Rust Remedial Services, Inc.
41 Atlantic Avenue
Woburn, MA 01801

Re: Additional seed for uplands
Industri-Plex
Woburn, MA

Dear Ms. Fagan:

Pursuant to your recent request, Coastal Environmental Services, Inc. (Coastal) has developed a list of additional upland seed for use this fall. The additional seed contains a variety of cool and warm season grasses as well as seed for a nurse crop. The mix also includes a native legume, partridge pea. The mix includes the following:

Species		Rate/Acre
Annual rye	(*Lolium multiflorum*)	15
Oats	(*Avena sativa*)	2 bushels
Red top	(*Agrostis alba*)	8
Big bluestem-Niagra	(*Andropogon gerardii*)	4
Indian grass	(*Sorgastrum nutans*)	2
Partridge pea*	(*Cassia fasiculata*)	2

* The use of partridge pea in the Fall seed mix may be difficult due to the lack of availability at this time and should be limited to use in the Spring.

The warm season grasses used in this mix, big bluestem and Indian grass, are frequently used to establish cover on heavily disturbed or barren sites such as in mine reclamation. The oats and annual rye were included to provide quick cover and to stabilize the soil until the other grasses, primarily the warm season grasses, can become established. Red top is a cool season grass that should develop this fall, but does not grow as quickly as the oats or annual rye. This mix is designed to use as an addition to

2 RESEARCH WAY, PRINCETON NJ 08540 • TEL (609) 987-0966 • FAX (609) 987-2443
WITH OFFICES IN BALTIMORE, MD AND ST. PETERSBURG, FL

the permanent mix set forth in the specification.

I have included the addresses of sources for the proposed seed mix as an attachment.

Coastal reviewed the laboratory data for the topsoil to be utilized as the final cover in the remediated uplands and suggests that if lime is to be included in the hydroseeding mix the rate should be less than 2.5 tons per acre. Rates greater than 2.5 tons per acre can affect seed germination. If you have any questions or comments, do not hesitate to call.

Sincerely,

Mark Gallagher
Senior Scientist

gallagher20/Fagan.ltr

PETER NEUMANN
GOLDER ASSOCIATES INC
400 COMMERCIAL ST
ANCHESTER NH 03101

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD INTERPRETATION OF BAKER SOIL TEST™ (BST) DATA.
THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B26	10-25-1994	4413			1.35	5.90	6.46	6.10	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC (PPB)	231.94	**********	**********	**********
Mehlich 3 P (PPM)	155.00	**********	**********	**********
POTASSIUM:				
BST pK	3.67	**********		
BST K (PPM)	9.59	**********		
Exchangeable (ppm)	58.50	**********		
Percent Of CEC	2.46	**********	**********	
MAGNESIUM:				
BST pMg	3.25	**********		
BST Mg (PPM)	24.10	**********		
Exchangeable (PPM)	60.00	**********		
Percent of CEC	8.20	**********		
CALCIUM:				
BST pCa	2.84	*		
BST Ca (PPM)	107.00	**********		
Exchangeable (PPM)	560.00	*****		
Percent of CEC	45.90	**********		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/H	5.11	**********		
Mg/K	2.05	**********	**********	
/Mg	0.40	**********		
		LOW	NORMAL	
BAKER SOIL TEST (BST) MANGANESE:				
BST pMn	8.36	**********		
BST Mn (PPM)	13.20	**********		
BST pFe	19.83	**********	**********	
BAKER SOIL TEST IRON:				
BST Fe (PPM)	92.30	**********	**********	**********
BAKER SOIL TEST COPPER:				
BST pCu	15.30	**********		
BST Cu (PPM)	0.70	*********		
BAKER SOIL TEST ZINC:				
BST pZn	11.99	**********		
BST Zn (PPM)	1.50	*********		
		LOW	NORMAL	HIGH

PETER NEUMANN FILE B26

```
                                |----------LOW----------|--------------------NORMAL--------------------|----------HIGH----------|
  N-ESSENTIAL ELEMENTS          |                       |                                            |                        |
                                |                       |                                            |                        |
  KER SOIL TEST FOR SODIUM:     |                       |                                            |                        |
    Na (PPM)            9.30    *****                   |                                            |                        |
                                |                       |                                            |                        |
  BAKER SOIL TEST FOR ALUMINUM: |                       |                                            |                        |
    Al (PPM)           34.80    ******************************************************************************************
    pAl                11.36    ******************************************************
                                |                       |                                            |
  BAKER SOIL TEST FOR LEAD:     |                       |                                            |
    Pb (PPM)            2.80    ****************************
    pPb                12.48    ****************************
                                |                       |                                            |
  BAKER SOIL TEST FOR NICKEL:   |                       |                                            |
    Ni (PPM)            0.20    **********              |                                            |
    pNi                14.72    *****************       |                                            |
                                |                       |                                            |
  BAKER SOIL TEST FOR CADMIUM:  |                       |                                            |
    Cd (PPM)            0.10    *************************|                                            |
    pCd                14.00    ****************************                                         |
                                |                       |                                            |
                                |----------LOW----------|--------------------NORMAL--------------------|----------HIGH----------
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

NOTE: SAMPLE ID #1 EAST SIDE WEST HIDE PILE
BST Cd <0.1 PPM

EPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=14.92 DILUTION FACTOR= 1.00

DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL
10/20/94	4413	070006	CENTRE	00	1	TURF ESTAB

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR: COPY SENT TO:

L M D INC
3048 RESEARCH DR
STATE COLLEGE PA 16801 00000

SOIL NUTRIENT LEVELS:

			LOW / OPTIMUM / HIGH / EXCESSIVE
Soil pH			XXXXX
Phosphate	(P_2O_5)	lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Potash	(K_2O)	lb/A	XXXXXXXXXXXXXXXXXXX
Magnesium	(MgO)	lb/A	XXXXXXXXXXXX
Calcium	(Ca)	lb/A	X

RECOMMENDATIONS FOR: PARK AREA - TO PLANT (KY. BLUE OR RYEGRASS)

See Back For Comments

			Comments
LIMESTONE:	2700	LBS PER ACRE	1,3
ORGANIC MATTER	65	CU. YDS. PER ACRE	2,3

APPLY THE FOLLOWING FERTILIZER NUTRIENTS AS INDICATED - AMOUNTS ARE IN LBS/ACRE

		NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	Comments
BASIC FERTILIZER		NONE	NONE	120	3,4
PLUS	QUICKLY AVAILABLE NITROGEN	60			
STARTER FERTILIZER	*OR*		30	30	5,6
	SLOWLY AVAILABLE NITROGEN	120			

MESSAGES:

CONTACT YOUR COUNTY AGENT IF YOU NEED ASSISTANCE IN INTERPRETING THIS RECOMMENDATION.

LABORATORY RESULTS:

SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		
5.9	310	2.7	0.15	0.5	2.8	6.1	2.4	7.8	45.0

OTHER TESTS:

ORGANIC MATTER - 1.8 %

SOIL03 TURF ESTAB.

ANALYTICAL REPORT

Centre Analytical Laboratories, Inc.

3048 Research Drive, State College PA 16801 814-231-8032 FAX 814-231-1253

LAND MANAGEMENT DECISIONS
3048 RESEARCH DRIVE
STATE COLLEGE , PA 16801
Account Number: 167

Contact: DALE BAKER

Date Received: 17-OCT-94
Date Reported: 25-OCT-94

Invoice Number: 5656

Date Collected: 11-OCT-94

Client ID: 1

Lab ID: LG177-1

PARAMETER	UNITS	RESULT	LIMIT OF QUANTIFICATION	TEST METHOD	TEST DATE	ANALY
PERCENT SOLIDS	%	99.37	.01	SM 2540A	19-OCT-94	GAF
TOTAL ORGANIC CARBON	mg/kg(dry)	4600	50	EPA 9060	21-OCT-94	SUB

Submitted by
Centre Analytical Labs, Inc.
Reviewed and Approved by:

Kevin J. Lloyd
Laboratory Supervisor

Please refer to the reverse side for our standard terms and conditions.

PETER NEUMANN
GOLDER ASSOCIATES INC
400 COMMERCIAL ST
MANCHESTER NH 03101

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

LMD™ INTERPRETATION OF BAKER SOIL TEST (BST) DATA.
THE BST IS ASTM OFFICIAL METHOD # D5435-93. STANDARD DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
B27	10-25-1994	4414			3.90	5.50	5.94	10.60	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
CALCULATED EPC (PPB)	249.09	**********	**********	**********
Mehlich 3 P (PPM)	165.00	**********	**********	**********
POTASSIUM:				
BST pK	3.67	**********		
BST K (PPM)	9.55	**********		
Exchangeable (ppm)	58.50	**********		
Percent Of CEC	1.42	**********		
MAGNESIUM:				
BST pMg	3.27	**********		
BST Mg (PPM)	23.10	**********		
Exchangeable (PPM)	48.00	*********		
Percent of CEC	3.77	*		
CALCIUM:				
BST pCa	2.88	*		
BST Ca (PPM)	97.00	**********		
Exchangeable (PPM)	460.00	**		
Percent of CEC	21.70	*		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/H	4.58	**********		
Ca/K	2.04	**********		
K/Mg	0.39	**********		
		LOW	NORMAL	
BAKER SOIL TEST (BST) MANGANESE:				
BST pMn	7.93	**********		
BST Mn (PPM)	14.80	**********		
BST pFe	19.38	**********		
BAKER SOIL TEST IRON:				
BST Fe (PPM)	107.00	**********	**********	**********
BAKER SOIL TEST COPPER:				
BST pCu	15.11	**********		
BST Cu (PPM)	0.50	******		
BAKER SOIL TEST ZINC:				
BST pZn	11.74	**********		
BST Zn (PPM)	1.70	**********		
		LOW	NORMAL	HIGH

PETER NEUMANN FILE B27

```
                                  |----------LOW----------|--------------------NORMAL-------------------|----------HIGH----------|
NON-ESSENTIAL ELEMENTS            |                       |                                           |                        |
                                  |                       |                                           |                        |
ER SOIL TEST FOR SODIUM:          |                       |                                           |                        |
 Na (PPM)            10.00        *****                   |                                           |                        |
                                  |                       |                                           |                        |
BAKER SOIL TEST FOR ALUMINUM:     |                       |                                           |                        |
 Al (PPM)            33.90        ******************************************************************************************
 pAl                 10.98        ************************************************************
                                  |                       |                                           |                        |
BAKER SOIL TEST FOR LEAD:         |                       |                                           |                        |
 Pb (PPM)             2.50        **************************
 pPb                 12.17        **************************
                                  |                       |                                           |                        |
BAKER SOIL TEST FOR NICKEL:       |                       |                                           |                        |
 Ni (PPM)             0.20        **********
 pNi                 14.54        **********************
                                  |                       |                                           |                        |
BAKER SOIL TEST FOR CADMIUM:      |                       |                                           |                        |
 Cd (PPM)             0.10        ************************|
 pCd                 13.62        *********************************
                                  |                       |                                           |                        |
                                  |----------LOW----------|--------------------NORMAL-------------------|----------HIGH----------|
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

NOTE: SAMPLE ID: #2 NORTHEAST SIDE OF WEST HIDE PILE
Cd <0.1 PPM

PT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

GAND=15.30 DILUTION FACTOR= 1.00

10/20/94	4414	070007	CENTRE	00	2	TURF ESTAB
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

L M D INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

				LOW / OPTIMUM / HIGH / EXCESSIVE
Soil pH				X
Phosphate	(P_2O_5)		lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Potash	(K_2O)		lb/A	XXXXXXXXXXX
Magnesium	(MgO)		lb/A	XXXXX
Calcium	(Ca)		lb/A	X

RECOMMENDATIONS FOR: PARK AREA - TO PLANT (KY. BLUE OR RYEGRASS)

See Back For Comments

LIMESTONE: 7800 LBS PER ACRE — 1,3

ORGANIC MATTER: NONE CU. YDS. PER ACRE

APPLY THE FOLLOWING FERTILIZER NUTRIENTS AS INDICATED - AMOUNTS ARE IN LBS/ACRE

		NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	See Back For Comments
BASIC FERTILIZER		NONE	NONE	240	3,4
PLUS STARTER FERTILIZER	QUICKLY AVAILABLE NITROGEN	60			
	OR		30	30	5,6
	SLOWLY AVAILABLE NITROGEN	120			

MESSAGES:

CONTACT YOUR COUNTY AGENT IF YOU NEED ASSISTANCE IN INTERPRETING THIS RECOMMENDATION.

LABORATORY RESULTS:

SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		
5.5	330	7.8	0.15	0.4	2.3	10.6	1.4	3.6	21.2

OTHER TESTS:

ORGANIC MATTER - 2.3 %

ANALYTICAL REPORT

Centre Analytical Laboratories, Inc.

3048 Research Drive, State College PA 16801 814-231-8032 FAX 814-231-1253

LAND MANAGEMENT DECISIONS
3048 RESEARCH DRIVE
STATE COLLEGE , PA 16801
Account Number: 167

Contact: DALE BAKER

Date Received: 17-OCT-94
Date Reported: 25-OCT-94

Invoice Number: 5656

Date Collected: 11-OCT-94

Client ID: 2

Lab ID: L6177-2

PARAMETER	UNITS	RESULT	LIMIT OF QUANTIFICATION	TEST METHOD	TEST DATE	ANALYST
PERCENT SOLIDS	%	99.22	.01	SM 2540A	19-OCT-94	GAF
TOTAL ORGANIC CARBON	mg/kg(dry)	7300	50	EPA 9060	21-OCT-94	SUB

Submitted by
Centre Analytical Labs, Inc.
Reviewed and Approved by:

Kevin J. Lloyd
Laboratory Supervisor

Please refer to the reverse side for our standard terms and conditions.

MAGNESIUM CONVERSION TABLE

FOR COMMERCIAL FRUITS AND VEGETABLES, WOODLOT AND CHRISTMAS TREES

If the magnesium level was found to be too low or out of balance with the other nutrients an application of magnesium is recommended. There are a number of materials that can be used. If both limestone and magnesium are required it will be most economical, generally, to use a limestone containing magnesium. The amount of the various materials needed to supply the magnesium recommendation can be determined from the following table.

Row application of special fertilizer containing 2 to 4 percent magnesium may be used if soil levels of magnesium are low. This may reduce magnesium problems for the current year. However, this will not correct low magnesium levels in the soil as too little is applied. For example, an application of 500 lbs. of fertilizer containing 2% Mg will supply only 10 lbs. of magnesium. To benefit from an application of such small amounts, it must be applied in the row.

Annual application of magnesium material should not be necessary for most crops if soil test recommendations are followed.

APPROXIMATE POUNDS OF MATERIALS (nearest 5 lbs.) REQUIRED

For a Magnesium recommendation of	Emjec (17% Mg)	Epsom Salt (11% Mg)	K-Mag (11% Mg)	Limestone (10% MgO) (6% Mg)	Limestone (15% MgO) (9% Mg)	Limestone (20% MgO) (12% Mg)	Magox (50% Mg)	Magnesium Sulfate (10% Mg)	Sul-Po-Mag (11% Mg)
40 lbs. Mg, use	230	360	360	650	450	350	80	360	360
50 lbs. Mg, use	295	450	450	850	550	400	100	450	450
60 lbs. Mg, use	350	540	540	1000	650	500	120	540	540
70 lbs. Mg, use	410	640	640	1200	800	600	140	640	640
80 lbs. Mg, use	470	730	730	1300	900	650	160	730	730
90 lbs. Mg, use	530	820	820	1500	1000	750	180	820	820
100 lbs. Mg, use	590	910	910	1700	1100	850	200	910	910
125 lbs. Mg, use	735	1140	1140	2000	1400	1000	250	1140	1140
150 lbs. Mg, use	880	1360	1360	2500	1600	1250	300	1360	1360
175 lbs. Mg, use	1030	1590	1590	3000	2000	1500	350	1590	1590
200 lbs. Mg, use	1180	1820	1820	3300	2200	1650	400	1820	1820
240 lbs. Mg, use	1410	2180	2180	4000	2700	2000	480	2180	2180

$Mg \times 1.6 = MgO \quad MgO \times 0.6 = Mg$

Golder Associates Inc.

400 Commercial Street
Manchester, NH USA 03101
Telephone (603) 668-0880
Fax (603) 668-1199

Golder Associates

TRANSMITTAL LETTER

To: LAND MANAGEMENT DECISIONS, INC.
BAKER SOIL TEST TM
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

ATTENTION DR. SENET.

Date: 6/9/94
Project No.: 933-6142.960

Sent by:

- [ ] Mail
- [ ] Courier
- [ ] Hand Carried
- [ ] Under Separate Cover
- [x] Federal Express
- [ ] Enclosed

Quantity	Item	Description
1	SOIL SAMPLE	FROM 219 NEW BOSTON ST. Planting area.
1	FORM	PAGE 4 OF PENN STATE UNIV. SOIL TEST
1	LETTER	TURF INC., JUNE 9, 1994

Remarks: Please run a Baker Soil Fertility Test on the sample enclosed. Crop is Turf. Both nitrogen fertilizer and lime have recently been added to soil. This test is intended to confirm fertile conditions. Please call me at (617) 932-9599 if you have any questions.

Per Peter Neumann

GOLDER ASSOCIATES
ATTN PETER NEUMANN
41 ATLANTIC AVE
BURN MA 01801

LAND MANAGEMENT DECISIONS, INC.
3048 RESEARCH DRIVE
STATE COLLEGE, PA 16801

TM

LMD INTERPRETATION OF BAKER SOIL TEST (BST) DATA.

THE BST IS AN OFFICIAL, ASTM METHOD # D5435-93. DIAGNOSTIC SOIL TEST FOR PLANT GROWTH AND FOOD CHAIN PROTECTION.

IDENTIFICATION	DATE	LAB NO	COUNTY	SOIL	LIME REQ.(T/AC)	SOIL PH	BST PH	CEC (MEQ/100 G)	SP. COND.
87	06-21-1994	1565			2.00	6.10	6.16	6.40	0.00

	TEST LEVEL	LOW	NORMAL	HIGH
PHOSPHORUS:				
Mehlich 3 P (PPM)	66.00	**********		
POTASSIUM:				
BST pK	3.78	**********		
BST K (PPM)	7.50	**********		
Exchangeable (ppm)	46.80	*****		
Percent Of CEC	1.87	**********		
MAGNESIUM:				
BST pMg	3.28	**********		
BST Mg (PPM)	22.20	**********		
Exchangeable (PPM)	48.00	********		
Percent of CEC	6.25	**********		
CALCIUM:				
BST pCa	2.92	*		
BST Ca (PPM)	88.90	**********		
hangeable (PPM)	400.00	*		
cent of CEC	31.25	**		
BAKER SOIL TEST CATION RATIOS:				
(Ca plus Mg)/H	4.78	**********		
Mg/K	2.14	**********		
Ca/Mg	0.36	**********		
BAKER SOIL TEST (BST) MANGANESE:				
BST pMn	7.89	**********		
BST Mn (PPM)	28.10	**********		
BST pFe	19.62	**********		
BAKER SOIL TEST IRON:				
BST Fe (PPM)	106.00	**********		
BAKER SOIL TEST COPPER:				
BST pCu	15.07	**********		
BST Cu (PPM)	0.90	**********		
BAKER SOIL TEST ZINC:				
BST pZn	12.11	**********		
BST Zn (PPM)	1.00	******		
		LOW	NORMAL	HIGH

GOLDER ASSOCIATES FILE B7

```
                                |----------LOW----------|---------------------NORMAL-------------------|----------HIGH----------|
  N-ESSENTIAL ELEMENTS          |                       |                                           |                        |
                                |                       |                                           |                        |
  AKER SOIL TEST FOR SODIUM:    |                       |                                           |                        |
    Na (PPM)          11.00     ******                  |                                           |                        |
                                |                       |                                           |                        |
  BAKER SOIL TEST FOR ALUMINUM: |                       |                                           |                        |
    Al (PPM)          26.10     ******************************************************************************************
    pAl               11.34     ******************************************************                |                        |
                                |                       |                                           |                        |
  BAKER SOIL TEST FOR LEAD:     |                       |                                           |                        |
    Pb (PPM)           3.70     ******************************                                        |                        |
    pPb               12.23     ******************************                                        |                        |
                                |                       |                                           |                        |
  BAKER SOIL TEST FOR NICKEL:   |                       |                                           |                        |
    Ni (PPM)           0.30     ***************         |                                           |                        |
    pNi               14.50     *************************|                                           |                        |
                                |                       |                                           |                        |
  BAKER SOIL TEST FOR CADMIUM:  |                       |                                           |                        |
    Cd (PPM)           0.10     *************************|                                           |                        |
    pCd               13.86     ******************************                                        |                        |
                                |                       |                                           |                        |
                                |----------LOW----------|---------------------NORMAL-------------------|----------HIGH----------|
```

PK, PMG, PCA, PAL, ETC. INDICATE THE AVAILABILITY OF RESPECTIVE ELEMENTS AND ARE CALCULATED NEGATIVE LOGARITHMS OF IONIC ACTIVITIES WHICH ARE ANALOGOUS TO PH, ACTIVITY OF THE HYDROGEN ION.

E: SAMPLE ID: INDUSTRI-PLEX SITE
BST Cd <0.1 PPM

EXCEPT FOR LIME REQUIREMENT, VALUES OF 0.0 INDICATE THAT THE SAMPLE WAS NOT ANALYZED FOR THAT PARAMETER.

pLIGAND=15.06 DILUTION FACTOR= 1.00

06/15/94	1565	027884	CENTRE	00		TURF ESTAB
DATE	LAB NO.	SERIAL NO.	COUNTY	ACRES	FIELD	SOIL

AGRICULTURAL ANALYTICAL SERVICES LABORATORY
COLLEGE OF AGRICULTURAL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
(814 863-0841)

SOIL TEST REPORT FOR:

LMD INC
3048 RESEARCH DR
STATE COLLEGE PA 16801

COPY SENT TO:

00000

SOIL NUTRIENT LEVELS:

				LOW	OPTIMUM	HIGH	EXCESSIVE
Soil pH				XXXXXXXX			
Phosphate	(P_2O_5)		lb/A	XXXXXXXXXXXXXXXXXXXXXXXXXX			
Potash	(K_2O)		lb/A	XXXXXXXXXXXXXX			
Magnesium	(MgO)		lb/A	XXXXXXXXXX			
Calcium	(Ca)		lb/A	X			

RECOMMENDATIONS FOR: *SOD PRODUCTION* *(RED FESCUE)*

See Back For Comments

LIMESTONE: *3900* LBS PER ACRE — 1,3

ORGANIC MATTER: *NONE* CU. YDS. PER ACRE

APPLY THE FOLLOWING FERTILIZER NUTRIENTS AS INDICATED - AMOUNTS ARE IN LBS/ACRE

		NITROGEN (N)	PHOSPHATE (P_2O_5)	POTASH (K_2O)	
BASIC FERTILIZER		*N/A*	*N/A*	*N/A*	
PLUS STARTER FERTILIZER	QUICKLY AVAILABLE NITROGEN	*60*			
	OR		*60*	*120*	5,6
	SLOWLY AVAILABLE NITROGEN	*90*			

MESSAGES:

CONTACT YOUR COUNTY AGENT IF YOU NEED ASSISTANCE IN INTERPRETING THIS RECOMMENDATION.

LABORATORY RESULTS:

6.1	132	3.9	0.12	0.4	2.0	6.4	1.8	6.5	31.2
SOIL pH	P lb/A	ACIDITY	K	Mg	Ca	CEC	K	Mg	Ca
		EXCHANGEABLE CATIONS (meq/100 g)					% SATURATION		

OTHER TESTS:

RUST REMEDIAL SERVICES, INC. -- EAST
41 Atlantic Avenue
Woburn, Massachusetts 01801
Telephone: (617) 938-7190
Fax: (617) 938-7194

LETTER OF TRANSMITTAL

DATE: 5/11/93 JOB NO. 67300 ATTENTION: T. Dale Kling

RE: ISRT Submittals

TO Industri-Plex Site Remedial Trust
41 Atlantic Avenue
Woburn, MA 01801

WE ARE SENDING YOU: ■ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change Order ☐ _____

COPIES	DATE	No.	DESCRIPTION
1	5/11/93		Townsend Soil Analysis

ISRT SUBMITTAL REVIEW
☒ No Exceptions Taken
☐ Make Corrections Noted
☐ Amend - Resubmit
☐ Rejected - Resubmit
Review Completion Date 5/24/93
PCN

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____, 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS
The lab originally did not analyze the soil for sodium and calcium. The results were originally submitted as 67300-0315-6.

COPY TO File, _____ SIGNED _____

If enclosures are not as noted, kindly notify us at once.

c:trnsisrt.rrs

MEMORANDUM

TO: Trustee Representative, ISRT DATE: 5/24/93
FROM: Peter Neumann, Golder Associates Inc. JOB NUMBER: 933-6142
RE: Review of CWM submittal "Townsend Soil Analysis" (Center Pit) (Section 02242) Original Submittal Control Number 67300-31S-6

Materials Reviewed:

1. Submittal consisted of 1 copy of 8 pages (8 1/2-inch by 11-inch) of Physical and Analytical Test Results.

- o Soil sample from Townsend, MA. The vendor was Roberto Loam.

- o Chain-of-Custody, p. 1
- o Analytical Test Results from 21st Century Environmental Inc.; p. 7

Analysis No. A 1290	
Cyanide	ND
TPH	56.6 mg/kg
Metals	All below thresholds
VOC	Below MDL levels on some
Pesticides	Undetected
Semi VOC	ND but some test fluids detected.

Review Comments:

Physical Test results,

Previously submitted and commented on 4/8/93

Analytical test results,

Previously submitted and commented on 4/13/93

Calcium and sodium metals test results added to list and were less than thethreshold values.

Disposition of Submittal:
No exceptions taken in accordance with Section 01300 of the 100% Design Documents.

21ST CENTURY ENVIRONMENTAL

618 HERON DRIVE, P.O. BOX 489 • BRIDGEPORT, NJ 08014-0489 • 609-467-9521

CHEMICAL WASTE MANAGEMENT

PROJECT: INDUSTRI-PLEX

ANALYSIS NO:	CLIENT ID:
A 1290	T-001

MAY 1993
Received
CWM-ASS
#67300

DATE RECEIVED: MARCH 19, 1993

TWENTY FIRST CENTURY
ENVIRONMENTAL, INC.

Richard W. Lynch

RICHARD W. LYNCH
LABORATORY MANAGER

A1290

CHAIN OF CUSTODY RECORD

Proj. No.	Project Name	
67300	Industri-Plex, Woburn, MA.	Roberto Loam Townsend Center Pit

Samplers (Signature)
William Spedding

Sample #	Date	Time	Comp.	Grab	Sample Description	No. of Containers	Remarks
T-001	3/8/93	1600	✓		Soil	5-8oz Jars	-See Attached Analysis Sheet. -Seven (7) day turnaround. -Please Fax results ASAP, Followed by Hard Copy.

Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
William Spedding	11:00 3/18/93			
Relinquished by: Signature	Date Time	Received by: (Signature)	Date Time	Received by: (Signature)
Relinquished by: Signature	Date Time	Received for Laboratory by: Lynda Clarke	Remarks	

FROM CMM ERD

CERTIFICATE OF ANALYSIS

ANALYSIS NO: A 1290

CLIENT ID: T-001

PARAMETER	MDL (mg/kg)	RESULT (mg/kg)
CYANIDE	0.10	N.D.

Analyzed by method 9010

CERTIFICATE OF ANALYSIS

TOTAL PETROLEUM HYDROCARBON

ANALYSIS NO:	CLIENT ID:	MDL (mg/kg)	RESULT (mg/kg)
A 1290	T-001	25.0	56.6

Analyzed by method 418.1

CERTIFICATE OF ANALYSIS

ANALYSIS NO: A 1290

CLIENT ID: T-001

METALS	MDL (mg/kg)	RESULT (mg/kg)
ALUMINUM	10.0	3910
ANTIMONY	5.00	N.D.
ARSENIC	0.25	3.08
BARIUM	5.00	19.8
BERYLLIUM	1.00	N.D.
CADMIUM	1.00	N.D.
CHROMIUM	1.00	4.18
COBALT	5.00	N.D.
COPPER	1.00	3.20
IRON	5.00	4050
LEAD	5.00	11.5
MAGNESIUM	5.00	741
MANGANESE	1.00	51.4
MERCURY	0.10	N.D.
NICKEL	5.00	N.D.
POTASSIUM	10.0	433
SELENIUM	0.25	0.35
SILVER	1.00	N.D.
THALLIUM	1.00	N.D.
VANADIUM	5.00	7.15
ZINC	1.00	11.6

Analyzed by methods 6010/7000

CERTIFICATE OF ANALYSIS

ANALYSIS NO: A 1290

CLIENT ID: T-001

METALS	MDL (mg/kg)	RESULT (mg/kg)	
CALCIUM	5.00	407	50.00
SODIUM	5.00	344	< 4,000

Analyzed by Method 6010

Lab Name : 21ST CENTURY ENVIRONMENTAL
Client ID:

Lab Sample ID:
A1290

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Pesticides/PCBs

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: 03/22/93
Date Analyzed: 03/23/93 12:46
Conc/Dil Factor: 10.08g/10mL
Percent Moisture: 12

GPC Cleanup __ Yes ✓ No
Separatory Funnel Extraction __ Yes
Continuous Liquid-Liquid Extraction __ Yes

C.A.S. Number		ug/L or (ug/Kg)	
319-84-6	Alpha-BHC.	5.7	U
319-87-7	Beta-BHC	5.7	U
319-86-8	Delta-BHC.	5.7	U
58-89-9	Gamma-BHC (Lindane). . .	5.7	U
76-44-8	Heptachlor	5.7	U
309-00-2	Aldrin	5.7	U
1024-57-3	Heptachlor Epoxide . . .	5.7	U
959-98-8	Endosulfan I	5.7	U
60-57-1	Dieldrin	5.7	U
72-55-9	4,4'-DDE	5.7	U
72-20-8	Endrin	5.7	U
33213-65-9	Endosulfan II.	11	U
72-54-8	4,4'-DDD	11	U
1031-07-8	Endosulfan Sulfate . . .	11	U
50-29-3	4,4'-DDT	11	U
72-43-5	Methoxychlor	280	U
7421-93-4	Endrin Aldehyde.	11	U
57-74-9	Chlordane.	280	U
8001-35-2	Toxaphene.	570	U
12674-11-2	Aroclor-1016.	280	U
11104-28-2	Aroclor-1221.	280	U
11141-16-5	Aroclor-1232.	280	U
53469-21-9	Aroclor-1242.	280	U
12672-29-6	Aroclor-1248.	280	U
11097-69-1	Aroclor-1254.	280	U
11096-82-5	Aroclor-1260.	290	U

U Undetected J Estimated value below detection level

Analyzed by method 8080

21ST CENTURY Environmental
SEMIVOLATILE ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NUMBER	A1290 CUM	DILUTION FACTOR	1.00
CLIENT ID	T0001	QA BATCH	
DATA FILE	>C0811	DATE ANALYZED	03/24/93

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
N-Nitrosodimethylamine	ND	380	Acenaphthene	ND	380
Phenol	ND	380	2,4-Dinitrophenol	ND	1900
bis(-2-Chloroethyl)Ether	ND	380	4-Nitrophenol	ND	1900
2-Cholorophenol	ND	380	Dibenzofuran	ND	380
1,3-Dichlorobenzene	ND	380	2,4-Dinitrotoluene	ND	380
1,4-Dichlorobenzene	ND	380	2,6-Dinitrotoluene	ND	380
Benzyl Alcohol	ND	380	Diethylphthalate	ND	380
1,2-Dichlorobenzene	ND	380	4-Chlorophenyl-phenlyether	ND	380
2-Methylphenol	ND	380	Fluorene	ND	380
bis(2-chloroisopropyl)Ether	ND	380	4-Nitroaniline	ND	1900
4-Methylphenol	ND	380	4,6-Dinitro-2-Methylphenol	ND	1900
N-Nitroso-Di-n-Propylamine	ND	380	N-Nitrosodiphenylamine	ND	380
Hexachloroethane	ND	380	4-Bromophenyl-phenylether	ND	380
Nitrobenzene	ND	380	Hexachlorobenzene	ND	380
Isophorone	ND	380	Pentachlorophenol	ND	1900
2-Nitrophenol	ND	380	Phenanthrene	ND	380
2,4-Dimethylphenol	ND	380	Anthracene	ND	380
Benzoic Acid	ND	1900	Di-n-Butylphthalate	ND	380
bis(-2-Chloroethoxy)Methane	ND	380	Fluoranthene	ND	380
2,4-Dichlorophenol	ND	380	Pyrene	ND	380
1,2,4-Trichlorobenzene	ND	380	Butylbenzylphthalate	ND	380
Naphthalene	ND	380	3,3'-Dichlorobenzidine	ND	750
4-Chloroaniline	ND	380	Benzo(a)Anthracene	ND	380
Hexachlorobutadiene	ND	380	Bis(2-Ethylhexyl)Phthalate	120 J	380
4-Chloro-3-Methylphenol	ND	380	Chrysene	ND	380
2-Methylnaphthalene	ND	380	Di-n-Octyl Phthalate	ND	380
Hexachlorocyclopentadiene	ND	380	Benzo(b)Fluoranthene	ND	380
2,4,6-Trichlorophenol	ND	380	Benzo(k)Fluoranthene	ND	380
2,4.5-Trichlorophenol	ND	1900	Benzo(a)Pyrene	ND	380
2-Chloronaphthalene	ND	380	Indeno(1,2,3-cd)Pyrene	ND	380
2-Nitroaniline	ND	1900	Dibenzo(a,h)Anthracene	ND	380
Dimethyl Phthalate	ND	380	Benzo(g,h,i)Perylene	ND	380
Acenaphthylene	ND	380	Benzidine	ND	750
3-Nitroaniline	ND	1900			

Percent Solid of 88.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Analyzed by method 8270

21st Century Environmental Inc.
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NUMBER	A1290	DILUTION FACTOR	1.00
CLIENT ID	T-001	QA BATCH	
DATA FILE	>A1106	DATE ANALYZED	03/24/93

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Acrolein	ND	57	Bromodichloromethane	ND	6
Acrylonitrile	ND	57	2-Chloroethylvinylether	ND	11
Chloromethane	ND	11	2-Hexanone	ND	11
Bromomethane	ND	11	trans-1,3-Dichloropropene	ND	6
Vinyl Chloride	ND	11	Toluene	2.9 J	6
Chloroethane	ND	11	cis-1,3-Dichloropropene	ND	6
Acetone	11 JB	11	1,1,2,2-Tetrachloroethane	ND	6
1,1-Dichloroethene	ND	6	1,1,2-Trichloroethane	ND	6
Carbon Disulfide	ND	11	4-Methyl-2-pentanone	ND	11
Methylene Chloride	2.6 JB	6	Tetrachloroethene	ND	6
1,2-Dichloroethene(trans)	ND	6	Dibromochloromethane	ND	6
1,1-Dichloroethane	ND	6	Chlorobenzene	ND	6
Vinyl Acetate	ND	6	Ethylbenzene	1.3 J	6
2-Butanone	ND	11	m&p-Xylenes	5.2 J	6
Chloroform	ND	6	o-Xylene	2.4 J	6
1,1,1-Trichloroethane	ND	6	Styrene	ND	6
Carbon Tetrachloride	ND	6	Bromoform	ND	6
1,2-Dichloroethane	ND	6	m-Dichlorobenzene	ND	6
Benzene	ND	6	p-Dichlorobenzene	ND	6
Trichloroethene	ND	6	o-Dichlorobenzene	ND	6
1,2-Dichloropropane	ND	6			

SURROGATE COMPOUNDS	% RECOVERY	LIMITS	STATUS
1,2-Dichloroethane-d4	109	70 - 121	OK
Toluene-d8	97.3	81 - 117	OK
Bromofluorobenzene	94.2	74 - 121	OK

Percent Solid of 88.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Analyzed by Method 8240

APPENDIX F.3

Soil Moisture Density Tests Summary

[Not Applicable To This Property]