CORRECTIVE ACTION COMPLETION CERTIFICATION REPORT

Flint Road Landfill Closure
90 Flint Road
Charlton, Massachusetts

May 2015

CDM Smith

Enter your transmittal number → X253986 (Transmittal Number)

Your unique Transmittal Number can be accessed online: http://mass.gov/dep/service/online/trasmfrm.shtml

Massachusetts Department of Environmental Protection

Transmittal Form for Permit Application and Payment

1. Please type or print. A separate Transmittal Form must be completed for each permit application.

2. Make your check payable to the Commonwealth of Massachusetts and mail it with a copy of this form to: DEP, P.O. Box 4062, Boston, MA 02211.

3. Three copies of this form will be needed.

Copy 1 - the original must accompany your permit application. **Copy 2** must accompany your fee payment. **Copy 3** should be retained for your records

4. Both fee-paying and exempt applicants must mail a copy of this transmittal form to:

MassDEP
P.O. Box 4062
Boston, MA
02211

*** Note:**
For BWSC Permits, enter the LSP.

A. Permit Information

1. Permit Code: 7 or 8 character code from permit instructions	2. Name of Permit Category
BWP SW 43	Landfill Closure Completion

3. Type of Project or Activity: Landfill Closure

B. Applicant Information – Firm or Individual

1. Name of Firm - Or, if party needing this approval is an individual enter name below: Town of Charlton

2. **Last Name** of Individual	3. **First Name** of Individual	4. MI

5. Street Address: 37 Main Street

6. City/Town	7. State	8. Zip Code	9. Telephone #	10. Ext. #
Charlton	MA	01507	508-248-2210	

11. Contact Person	12. e-mail address (optional)
Board of Health	

C. Facility, Site or Individual Requiring Approval

1. Name of Facility, Site Or Individual: Charlton Landfill

2. Street Address: 90 Flint Road

3. City/Town	4. State	5. Zip Code	6. Telephone #	7. Ext. #
Charlton	MA	01507	N/A	

8. DEP Facility Number (if Known)	9. Federal I.D. Number (if Known)	10. BWSC Tracking # (if Known)
172405		

D. Application Prepared by (if different from Section B)*

1. Name of Firm Or Individual: CDM Smith Inc.

2. Address: 50 Hampshire Street

3. City/Town	4. State	5. Zip Code	6. Telephone #	7. Ext. #
Cambridge	MA	02139	617-452-6000	6589

8. Contact Person	9. LSP Number (BWSC Permits only)
Laura A. Bugay, P.E.	

E. Permit - Project Coordination

1. Is this project subject to MEPA review? ☐ yes ☒ no
   If yes, enter the project's EOEA file number - assigned when an Environmental Notification Form is submitted to the MEPA unit:

EOEA File Number

F. Amount Due

DEP Use Only

Permit No:

Rec'd Date:

Reviewer:

Special Provisions:

1. ☒ **Fee** Exempt (city, town or municipal housing authority)(state agency if fee is $100 or less).
   There are no fee exemptions for BWSC permits, regardless of applicant status.
2. ☐ Hardship Request - payment extensions according to 310 CMR 4.04(3)(c).
3. ☐ Alternative Schedule Project (according to 310 CMR 4.05 and 4.10).
4. ☐ Homeowner (according to 310 CMR 4.02).

Check Number	Dollar Amount	Date

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Solid Waste Management

BWP SW 43 Landfill Closure Completion

Application for Determination of Landfill Closure Completion and Post Closure Planning

X253986
Transmittal Number

172405
Facility ID# (if known)

A. Applicant Information

Town of Charlton, Board of Health
Name

37 Main Street
Street Address

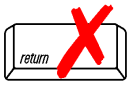
Charlton | MA | 01507
City/Town | State | Zip Code

508-248-2210
Telephone

Board of Health | 508-248-2210
Contact Person | Contact Telephone

B. Project Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Directions: Specify the plan/report and page numbers where the information is located. Enter "N/A" if information requested is not applicable.

Important Note: Engineering Plans must be stamped by a Registered Professional Engineer (PE). Property Line Location must be stamped by a Registered Land Surveyor (RLS).

	Plan/Report #	Page #	DEP Use Only
1. Landfill Assessment summation report	N/A		
a. Public health, safety or environmental concerns	N/A		
b. Closure design description	N/A		
2. Final Closure Construction	Report	Section 2	
a. Construction report. Description of general construction activity especially unusual, unexpected or other changes to intended design.	Report	Section 2	
b. As-Built Plans	Report	App B	
(1) QA/QC documentation 310 CMR 19.106	Report	Apps B-I, K	
(2) P.E. signed and stamped	Report	App B	
(3) Construction Certification 310 CMR 19.107	Report	Section 3	
3. Post Closure Requirements	Report	Section 4	
a. Post closure maintenance plan	Report	Section 4	
(1) Final cover evaluation	Report	Section 4	

B. Project Information (cont.)

	Plan/Report #	Page #	DEP Use Only
(2) Landfill gas controls	Report	Section 4	
(3) Leachate management	N/A		
(4) Surface water management	N/A		
(5) Erosion and sedimentation control	N/A		
b. Post closure monitoring plan	Report	Section 4	
(1) Sampling locations	Report	Section 4	
(2) Sampling frequency	Report	Section 4	
(3) Sampling parameters	Report	Section 4	
(4) Narrative summary of monitoring data (previous 5 years)	Report	Section 4	
c. Corrective action plan	N/A	N/A	
4. Post-closure use	Report	Section 4	
a. Description of post-closure use	N/A	N/A	
b. Specific post-closure use monitoring maintenance, and assessment methods	N/A	N/A	
5. Deed Notice (19.041(6))	Report	Section 4	
6. Financial Assurance for Post-Closure Care (310 CMR 19.051)	Report	Section 4	
a. Mechanism (310 CMR 19.051(12))	Report	Section 4	
b. Amount (310 CMR 19.051(5)	N/A	N/A	
7. Reporting Requirements	Report	Section 4	
a. Identify all reporting requirements for inspection, assessment and environmental monitoring activities, etc	Report	Section 4	
b. Provide a summary table of all reporting requirements including item, frequency, and submission requirements	Report	Table 4-1	

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Solid Waste Management

X253986
Transmittal Number

BWP SW 43 Landfill Closure Completion

Application for Determination of Landfill Closure Completion and Post Closure Planning

172405
Facility ID# (if known)

C. Certification & Engineer's Supervision: 310 CMR 19.011

Engineer's Supervision:

All papers pertaining to design, operation, or engineering of this site or facility shall be completed under the supervision of a Massachusetts registered professional engineer knowledgeable in solid waste facility design, construction and operation, and shall bear the seal, signature and discipline of said engineer. The soils, geology, air monitoring and groundwater sections of the application or monitoring report shall be completed by competent professionals experienced in the fields of soil science and soil engineering, geology, air monitoring and groundwater, respectively, under the supervision of a Massachusetts registered professional engineer. All mapping and surveying shall be completed by a registered surveyor.

Laura A. Bugay, P.E.
Print Name

Authorized Signature

Project Manager
Position/Title

CDM Smith Inc.
Company

47599
P.E. #

5/11/15
Date

Certification:

Any person, required by these regulations or any order issued by the Department, to submit papers shall identify themselves by name, profession, and relationship to the applicant and legal interest in the facility, and make the following certification: "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties both civil and criminal for submitting false information including possible fines and imprisonment."

Robin Craver
Print Name

Authorized Signature

Town Administrator
Position/Title

6/18/2015
Date

75 State Street
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901
cdmsmith.com

May 11, 2015

Mr. James McQuade
Section Chief – Solid Waste
Central Regional Office
Massachusetts Department of Environmental Protection
8 New Bond Street
Worcester, Massachusetts 01606

Subject: Certification Report for Corrective Actions Approach
Charlton Landfill, Charlton, Massachusetts
MassDEP Transmittal #: X253986

Dear Mr. McQuade:

Attached please find a copy of a Certification Report prepared by CDM Smith Inc. (CDM Smith) summarizing the corrective actions performed by the Town of Charlton (Town) at the Charlton Landfill located off Flint Road. The corrective actions were implemented by the Town as required by the Unilateral Administrative Order (UAO) dated August 27, 2009 issued by the Massachusetts Department of Environmental Protection (MassDEP). The specific work completed was as described in several subsequent technical submittals required by the UAO and approved by MassDEP. Copies of pertinent documents related to the closure are provided in the appendices to the attached Report.

The UAO was issued after a private contractor retained by the Town to complete the closure abandoned the project partially completed. At that time, the project was significantly out of compliance with the Corrective Action Design (CAD) permit approved by MassDEP in 2006. In addition to the use of the financial assurance funds set aside by the private operator, the Town had to appropriate an additional $1 million to cover the costs of constructing the final cap and actions related to the impacts on the surrounding wetland resource areas.

The final corrective action for the Charlton Landfill provides a capped landfill that meets the General Design Standards outlined in the MassDEP's Solid Waste Management Regulations (310 CMR 19.000, the Regulations). Specifically, the final cap will comply with the Standards outlined in Section 19.112 (2) of the Regulations for a landfill final cover system as follows:

- The FML and associated capping system over the former landfilled waste will minimize infiltration into the underlying landfilled waste. Groundwater monitoring at the site shows only arsenic exceeding primary drinking water standards in three downgradient monitoring wells.

- The final cap design includes an extensive series of intermediate side-slope swales and down chutes that promote the proper drainage of precipitation away from the cap and towards the existing detention basin;

- The combination of the FML and the drainage geocomposite adequately isolates the landfilled wastes from the environment;

- The final cap design even on the steeper slopes along with the drainage system minimizes erosion of the final cap. The final cap system has remained in-place and stable since the completion of construction in 2012;

- The gas vents installed by the prior operator provide adequate venting for landfill gases generated by the historic landfilled waste; and,

- The final cap system as installed is stable and will accommodate future settlement and subsidence adequately so that the other criteria described above will continue to be met.

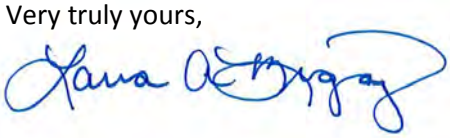
We have conducted a few brief site walks since closure. The cap was observed to be in good condition. A complete post-closure inspection will be conducted in the spring 2015 to assess the condition of the entire site and identify any maintenance items that need to be addressed.

We specifically request that MassDEP approve the attached Certification Report summarizing the closure of the Charlton Landfill and approve the closure as complete in accordance with 310 CMR 19.140. We are also requesting on behalf of the Town that the prior technical submittals made in response to the UAO be considered as revisions to the CAD permit approved by MassDEP in 2006. We believe that these supplemental submittals have already been approved by MassDEP in accordance with the Regulations and the UAO. We are also requesting that MassDEP provide the Town with correspondence stating that the requirements of the UAO have been fulfilled.

Once MassDEP approves the attached certification report, the Town will record the required Notice of Landfill Operations as required by section 310 CMR 19.141 of the Regulations. CDM Smith will also provide separately a Post-Closure Environmental Monitoring and Site Maintenance Plan to MassDEP for review and approval.

Please do not hesitate to contact me at (617) 452-6589 if you have any further questions or to arrange for a meeting to discuss this project further.

Very truly yours,



Laura Bugay, P.E.
Project Manager
CDM Smith Inc.

Attachment

c: Robin Craver, Charlton
Board of Health, Charlton
Bruce Haskell, Langdon Environmental
File: 75398/72037/03/05

Table of Contents

List of Figures

List of Tables

Appendices

Section 1
Introduction

This Certification Report addresses the completion of the corrective action capping and associated activities at the Charlton Landfill (Landfill) located off Flint Road in Charlton, Massachusetts. This section provides an outline of the site history including the regulatory process and a summary of the construction work items being certified by CDM Smith Inc. (CDM Smith) in this document.

Completion of the closure of the Landfill was complicated by the condition that a prior operator left the site in, the involvement of intensive regulatory oversight, changeover in the middle of construction of the certifying engineer, and the lack of available funding to complete closure requirements. The site conditions were discussed extensively with Massachusetts Department of Environmental Protection (MassDEP) staff both during the initial phase of work and while final corrective action plans and approaches were being developed for the Landfill. As detailed below, CDM Smith is certifying certain work implemented in response to MassDEP enforcement actions and that the final corrective action as described herein substantially meets the requirements for a final cap contained in MassDEP's Solid Waste Management Regulations (310 CMR 19.000, Regulations).

1.1 Certification Approach

The closure of the Landfill was initially implemented by the Town's Board of Health through an agreement with BATG Environmental. This agreement required BATG to permit the closure of the Landfill in accordance with the MassDEP's Regulations. The BATG project included the acceptance of an approved quantity of grading and shaping soils as allowed under MassDEP policies with the revenues from the disposal of the soils being used to fund a Financial Assurance Mechanism (FAM) of an amount approved by MassDEP to complete the final closure. BATG was also responsible to retain a Registered Professional Engineer to prepare design plans as well as certify construction activities related to the capping. There were frequent inspections and subsequent enforcement actions by MassDEP during the timeframe that BATG was implementing the project.

In late 2009, the Town was forced to terminate the agreement with BATG for non-performance. At that time, the Landfill had several areas recognized by MassDEP as not in conformance with the approved Corrective Action Design (CAD) permit including slopes that were steeper than 3 horizontal to 1 vertical; additional grading and shaping soils received and placed beyond the limits established in MassDEP permits; a stockpile of additional historic fill soils placed outside the Landfill limits; and significant siltation in wetland resource areas around the Site. At that time, BATG had completed the grading of the landfill and installed an HDPE flexible membrane liner (FML) over the Landfill.

CDM Smith was retained by the Town to evaluate existing conditions and develop an estimate of construction costs necessary to complete the capping of the Landfill. Concurrent with these efforts, MassDEP continued with an enforcement process against BATG to correct the conditions that were out of compliance with permit approvals and regulations. The result of CDM Smith's work was to identify specific technical issues related to the condition of the closure process and that the funds

available in the FAM were not sufficient to complete the required work. BATG subsequently abandoned the Landfill and left the Town responsible to complete the closure.

The closure completion design work completed by CDM Smith was performed in response to a Unilateral Administrative Order (UAO) dated August 27, 2009. The UAO required the Town to conduct a series of short-term site stabilization measures on an accelerated schedule while a revised plan to complete the capping was developed. The Town issued a construction bid package to complete the short-term stabilization activities in September 2009 and they were completed in accordance with the schedule contained in the UAO. CDM Smith's proposed approach was contained in a Landfill Closure Evaluation Report dated September 3, 2009 that was ultimately approved by MassDEP after responses to comments. A more detailed summary of this process is provided below.

The Town retained CDM Smith to develop a revised design for completion of the corrective action for the final cap and restoration of the damaged wetland resource areas. The Town was required to appropriate additional funds on two occasions from Town Meeting in addition to use of the FAM funds set aside for this purpose.

Because CDM Smith was retained by the Town after BATG failed to fulfill their contractual requirements, several corrective action components were installed prior to CDM Smith's involvement and are not being certified by CDM Smith as part of this report. These include installation of the sand gas venting/bedding layer, the FML, and the passive landfill gas vents; the placement of grading and shaping materials including review of their proposed source(s); establishment of the minimum and maximum slopes required by MassDEP regulations; and construction of the stormwater retention system. However, the condition of all of these items at the time BATG abandoned the site were presented to MassDEP by CDM Smith and MassDEP agreed that they were installed in an adequate manner that they either did not require any further actions or CDM Smith identified and implemented additional required actions. For the items not overseen by CDM Smith, available information generated by others is provided as part of this report.

In September 2009, the Town retained T. Ford Company of Georgetown, Massachusetts to complete an initial set of site stabilization activities required by the UAO. In July 2011, the Town retained J. Bates and Son of Clinton, Massachusetts as a construction contractor to complete the remaining work related to the corrective action. This work was substantially completed in late 2011 with an additional year of site stabilization activities required because of the steepness and extensive stormwater controls incorporated into the cap system.

Based on the regulatory history of implementation of the corrective action at the Landfill, CDM Smith is certifying completion of the following items as described herein in accordance with the Regulations:

- Site stabilization activities as required by the August 2009 UAO;
- Repairs to the FML including replacement of an area conducted during CDM Smith's activities;
- Installation and stabilization of the perimeter roadway using the stockpiled historic fill soils;
- Installation of the cap layers above the FML and the associated stormwater drainage system;

- Stabilization of disturbed areas such as the site entrance outside of the limits of the FML;
- Re-establishment of the stormwater retention basin; and
- Installation of new groundwater monitoring wells.

There was additional work completed related to restoration of wetland resource areas that has been separately accepted and approved by MassDEP. The wetland related work will not be described in any detail herein.

1.2 Site Description and Location

The Landfill is located at 90 Flint Road across from Old Town Road in Charlton, Massachusetts. The landfill is approximately 9.5 acres and was used by the Town between 1978 and February 1992 for disposal of municipal solid waste. The landfill is one of two located on Flint Road; it is the most southern landfill of the two.

A site locus is provided as Figure 1-1.

1.3 Regulatory History

To complete the MassDEP-requirement to construct a final cover over the unlined Landfill, the Town originally retained BATG Environmental, Inc. of Taunton, Massachusetts (BATG). BATG was responsible to develop and implement corrective action design plans in accordance with the regulations. BATG proposed to accept an amount of grading and shaping soils in accordance with MassDEP policies and utilize the disposal fees to pay for construction of the final cap.

A landfill Corrective Action Design (CAD) was prepared and submitted for the Town in December 2004 by Tata & Howard. The first CAD submitted in December 2004 was deemed technically deficient by MassDEP. Through an Administrative Consent Order and Notice of Noncompliance, a revised CAD application was submitted to MassDEP in January 2006 and was subsequently approved by MassDEP on June 16, 2006. This approval included the placement of up to 115,000 cubic yards of shaping and grading material as part of the closure.

During the shaping a grading portion of the closure construction project, BATG was subject to multiple Unilateral Administrative Orders (UAOs), Administrative Consent Orders (ACOs) with penalties and received multiple Notices of Noncompliance from the MassDEP between January 2007 and November 2008. These enforcement actions were generally for stormwater, wetland and grading and shaping material management related issues. BATG failed on numerous occasions to meet multiple deadlines for closure construction as stipulated in various MassDEP Orders. After completing several closure related items, BATG abandoned the Landfill with an exposed FML, a significant stockpile of historic fill soils located outside the limits of the FML and significant sedimentation in the surrounding wetland resource areas. When BATG abandoned the site in 2009, site conditions were significantly out of compliance with the MassDEP-approved CAD permit.

N

Basemap: USGS 7.5-minute Topographic Quadsheet
Source: ESRI ArcGIS Online, NGS Topo US
Coord. System: NAD83 Mass. State Plane Mainland FIPS 2001 (feet)

Charlton Landfill
90 Flint Road
Charlton, Massachusetts

0 500 1,000 2,000 Feet

Figure 1-1
Site Location Plan

CDM Smith

billingsmc C:\Projects\L\Enviro_Receptor_Maps\CharltonLandfill\MXD\Site_Locus.mxd 8/20/2014

In August 2009, MassDEP issued a UAO to the Town that required the Town to provide an evaluation report prepared by a Registered Professional Engineer that evaluated existing site conditions and outlined a proposed estimate and schedule to complete the cap. CDM Smith was retained by the Town to conduct this evaluation and submitted a proposed revision to the approved cap cross section and stormwater drainage design in the September 3, 2009 Landfill Closure Evaluation Report and correspondence dated March 9, 2010. The Town also implemented steps to stabilize the Landfill and surrounding areas as described herein in response to the UAO. Site conditions required an alternative cap cross section on the existing slopes steeper than 3H:1V and reuse of the on-site stockpiled historic fill materials. The alternative cap and overall approach was approved by MassDEP in separate correspondence dated November 6, 2009 and March 15, 2010 and forms the basis for the final corrective action design as described herein.

The permitting of the remaining steps for the closure of the Landfill conducted by CDM Smith was performed in response to the UAO. MassDEP did not require submission of any permit applications related to modifying the existing CAD permit in response to the UAO. However during the fall of 2009 through the spring of 2010, there were numerous meetings with MassDEP, the Town and CDM Smith to coordinate the approach and complete the required work.

Copies of pertinent correspondence and documents referenced above are provided in Appendix A.

1.4 Corrective Action Implementation

Implementation of the final Corrective Action Design (CAD) for the Landfill was conducted in three phases. The initial phase was completed by BATG under an agreement with the Town and included construction of initial site improvements including the access road and stormwater retention basin, placement of the grading and shaping soils, installation of the gas venting/bedding layer and FML and initial permitting. This work was completed prior to CDM Smith being retained by the Town and is not being certified by CDM Smith as discussed above. However, CDM Smith is providing available information on these items as part of this report solely for completeness.

The second phase of work was conducted in response to the August 2009 UAO included stabilization of the existing FML; re-channeling stormwater towards the retention basin, construction of a perimeter stormwater drainage system and stabilization of the perimeter access road to control continued discharge of sediments into wetland resource areas; reconstruction of the existing stormwater detention basin; and installation of additional erosion control measures around exposed stockpiled soils. This construction work was completed on an expedited schedule by T. Ford Company of Georgetown, Massachusetts and was overseen by CDM Smith and was completed during the fall of 2009. Information on this work is provided herein.

The final phase of work was the completion of the revised cap in accordance with MassDEP's approvals. In response to the August 2009 UAO, CDM Smith provided an evaluation of existing site conditions including the integrity of the existing FML; proposals for the reuse of stockpiled soils, revisions to the approved CAD permit application; adequacy of the stormwater control system; proposed steps for site stabilization; and an updated cost and schedule to complete the revised capping. These items were addressed in the September 3, 2009 CDM Smith letter report to MassDEP that included the following significant conclusions:

- Visible evidence of the installed FML and a limited site visit during installation by CDM Smith indicated that it was generally installed in accordance with standard construction practices including the collection of destructive samples and repairs. Documentation from either the FML installer or a certifying engineer are not available for inclusion in this report.

- The FML did not have any significant visible damage from wind or exposure to the elements. CDM Smith noted several repair and completion items for the FML including replacement of a section that were implemented during the final phase and are presented herein.

- Information on the sand reportedly used by BATG for the gas venting/bedding layer had previously been submitted to MassDEP. While CDM Smith was unable to verify that this source was utilized or what measures were utilized to confirm its conformance with the approved CAD, there is no evidence that there are significant protruding items that have or could potentially damage the FML.

- The gas vents installed by BATG appeared to be in good condition. Field sampling of the vents to determine if they were venting landfill gas would be conducted by CDM Smith.

- Samples from the stockpiled historic fill soils were tested and did not have any exceedances of MassDEP's S-1/GW-1 standards established in the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000). Based on these results, CDM Smith developed a proposal to process these soils and leave them in-place as the perimeter access road and incorporate them into the final cap cross-section.

- CDM Smith included specific requests for modifications to the MassDEP-approved CAD permit including acceptance of the steeper than 3 horizontal to 1 vertical slopes; acceptance of grading and shaping materials in excess of the 115,000 cubic yards approved by MassDEP; the lack of information on the delineation of the limits of the historic landfill; and the lack of the proposed stormwater drainage controls including swales and downchutes. To address these existing conditions, CDM Smith proposed a series of revisions to the MassDEP approved CAD permit as outlined below.

- Proposed repairs including removal of built-up sedimentation in the existing stormwater retention basin to be in general compliance with the approved permits.

- A series of steps including additional erosion control barriers; re-grading of the perimeter access road to pitch inward towards a reconstructed swale; and stabilization of areas with loam and seed on the areas below the perimeter access road.

Also in response to the August 2009 UAO, CDM Smith provided a letter dated September 26, 2009 (with supplemental plan included in a letter dated November 17, 2009) regarding the condition of the FML. CDM Smith made provisions in the cap construction documents for a liner installer to complete repairs on the existing liner.

In a letter dated November 6, 2009, MassDEP approved many parts of the CDM Smith proposed approach and required supplemental work as follows:

- No additional information was required related to the gas venting/bedding layer;
- Testing of the existing gas wells for methane shall be conducted and their total depth measured;
- Approved the proposed alternative cap cross-section (discussed below) with respect to the exceedances of the 3 horizontal to 1 vertical maximum slopes contained in the Regulations;
- Required additional laboratory analytical testing of the stockpiled soils and comparison to revised risk-assessment based standards prior to finalizing approval that they can be reused in the alternative cap;
- Denied long-term storage and disposal of screenings and excess soil from the stockpiled areas on-site;
- Did not require any further delineation of the edge of landfilled waste but required repairs and assessment to address a leachate breakout and landfill gas odors along the base of one slope;
- Approved proposed revisions to the stormwater detention system;
- Required additional geotechnical testing and analysis of the roadway soils; and
- Accepted that the total quantity of grading and shaping soils exceeded the 115,000 cubic yards previously approved.

After a meeting with MassDEP, CDM Smith submitted a response letter dated December 11, 2009 that provided a proposed approach to use the stockpiled soils on-site based on a risk-assessment. This letter proposed a supplemental sampling program and the overall approach for their re-use. A supplemental letter dated March 9, 2010 from CDM Smith requesting MassDEP approval of the alternative cap and including some additional information on the its anticipated maximum permeability. The alternative cap approach was approved by MassDEP in a letter dated March 15, 2010.

In summary, the proposed final corrective action was modified based on numerous technical submittals and meetings with MassDEP staff. These submittals fully addressed the requirements of the August 2009 UAO and comments from MassDEP on the prior submittals.

Copies of referenced correspondence from CDM Smith and MassDEP are included in Appendix A.

1.4.1 Wetland Restoration and Replication

The MassDEP issued ACO dated January 4, 2011 (ACO-CE-10-6W003) outlined requirements for replication and restoration of the wetlands damaged by prior operations around the Landfill and as required by the originally approved CAD permit. The original CAD permit included a 15,000 square foot wetland replication area in the northeast corner of the site. Because this area coincided with the location of the soil stockpiles and was not well located for a hydraulic connection needed to sustain the replicated wetland, the proposed location for wetland restoration and replication was revised.

The final revised plans prepared by CDM Smith also included two wetland restoration areas to restore downgradient wetlands from sedimentation caused by the previous contractor. Restoration included excavation of deposited sediments to depths established by exploratory test pits, placement of topsoil, final seeding with the New England wetland seed mix and installation of specific wetland plants. The wetland replication and restoration plans are included with the record drawings in Appendix B.

CDM Smith submitted a letter dated September 13, 2012 to MassDEP certifying that the wetland restoration and replication work was completed. MassDEP issued a letter dated October 1, 2012 that closed out the requirements of the ACO. At this time, there are no further issues related to the wetland restoration and replication requirements at this Landfill.

Copies of the above referenced correspondence are included in Appendix A.

1.5 Modifications to the Approved Corrective Action Design

The following revisions were made during construction to address field conditions and various changes. These were all presented and discussed with MassDEP at the time of implementation:

- ***Access Road/Culvert.*** The contractor proposed to install a permanent landfill access road atop of the capped landfill to facilitate placement of cap soils on top of the existing FML without damaging it. A culvert was designed and constructed to convey stormwater underneath this access road. The construction detail of this culvert is included in the record drawings contained in Appendix B.

- ***Geomembrane Replacement.*** The results of the interface friction angle testing indicated that the existing textured geomembrane manufactured by Solmax (one of two geomembranes installed on site) did not meet the required friction angle. This specific type of geomembrane was located in the northeast and southwest corners of the landfill. Since the southwest corner of the landfill has the steepest slopes in excess of those required by the Regulations, it was determined that the geomembrane on this steeper slope be replaced with a product with a higher interface friction angle. Approximately one acre of geomembrane was replaced with an Agru Microspike 40-mil HDPE geomembrane. Geomembrane certifications, installation information and interface friction angle test results are contained in Appendix D.

- ***Leachate Trench:*** Subsurface drainage was observed at the southern toe of slope during final cap construction, therefore a stone collection trench was installed. The trench is approximately 15-feet long by 4-feet wide and 10-feet deep. Subsurface flow was observed entering the trench from the north in multiple locations between 1-foot and 5-feet below ground surface (bgs). Since installation of the trench, subsurface flow has not been observed breaking out in the area and surface conditions have been dry.

Section 2
Corrective Action Certification

2.1 Introduction

The revised CAD for the final cover over the Landfill as modified by CDM Smith following assessment of site conditions, included the completion of the landfill capping using appropriate materials to effectively complete the cap, control stormwater at the site, stabilize slopes, replicate and restore wetlands. This section will provide a summary of the work completed by both BATG and the two construction contractors retained by the Town to complete the work.

Due to the timeframes outlined in the August 2009 UAO, the Town conducted an emergency procurement in accordance with Massachusetts public construction bidding laws and selected T. Ford Corporation of Georgetown, Massachusetts to conduct a series of site stabilization activities while the revised closure design approach could be developed by CDM Smith and approved by MassDEP. T. Ford conducted the following activities at the Landfill in preparation for final closure:

- Repaired anchor trench and re-anchored existing FML;
- Installed FML flap and constructed perimeter drainage swale;
- Re-established existing stormwater basin; and
- Stabilized perimeter access road.

CDM Smith provided on-site oversight of T. Ford's activities.

Based on the development of the final design, the Town was required to issue another construction bid and selected a new landfill closure completion contractor, J. Bates and Son of Clinton, Massachusetts (J. Bates). J Bates conducted the construction activities on the site from July 2011 to September 2011, when substantial completion was achieved. This contractor re-mobilized in April 2012 to conduct spring cleanup. CDM Smith provided on-site oversight of this work. The work completed by J. Bates is the corrective action for the project and is the basis for the information provided in the remainder of this Certification Report.

Note that for the reasons detailed in Section 1, many aspects of the closure construction were completed by BATG. In the presentation below, CDM Smith will provide information as available on BATG's activities and reference data in the appendices but CDM Smith is not certifying that this work was completed in accordance with the regulations.

2.2 Subgrade Preparation

Subgrade preparation was conducted at the site by the previous site contractor, BATG. Grading and shaping soil was brought in to the site to grade and shape the landfill to achieve pre-capping grades. The pre-capping grades approved in the original closure design were not achieved by the contractor.

Instead the site was overfilled, resulting in the southern slope being steeper than 3H:1V and stormwater benches were not constructed into the slopes.

During installation of the 40-mil textured HDPE on the site in December 2008, a sand bedding/gas venting layer was observed on a limited area by CDM Smith during a site visit. CDM Smith does not have any information regarding whether the subgrade was accepted by the FML installer, Terrafix Corporation, but notes that the FML does not appear to be underlain by a significant number of protruding items that could damage it.

In their correspondence, MassDEP accepted the subgrade including the steeper slopes and did not require any further testing or repairs.

2.3 Gas Venting/Bedding Layer

The sand bedding/gas venting layer was installed by the previous contractor, BATG. During FML installation and FML replacement during J. Bates activities, CDM Smith observed a sand bedding/gas venting layer in place. The only testing available for this layer are two permeability tests provided by the previous contractor in September 2008. This documentation is provided in Appendix C. No other testing information is available for this layer.

In their correspondence approving revisions to the CAD permit, MassDEP did not require any further investigations or testing of the gas venting/bedding layer.

2.4 HDPE FML Low Permeability Layer

The FML was installed in three phases by the previous contractor, BATG. Installation information was previously submitted to MassDEP and is included in the CDM Smith report entitled "Landfill Closure Evaluation Report, dated September 3, 2009 and subsequent CDM Smith correspondence dated September 26, 2009 and November 17, 2009 (as attached in Appendix A).

The FML installed is a 40 mil (1.0mm) HDPE textured geomembrane, manufactured by Agru America Inc. (Agru) and Solmax International (Solmax). Terrafix Environmental USA, Inc., of Lewiston, Maine installed the HDPE geomembrane for the project in December 2008, February 2009, and March 2009.

MassDEP agreed to accept the existing FML with some repairs based on CDM Smith's submissions during the fall of 2009. These repairs were completed and are summarized below.

An approximate 1-acre section of the Solmax geomembrane was replaced on the southern slope during final closure construction in 2011 following results of the confirmatory interface friction angle testing revealed the section of liner did not have sufficient friction for slope stability. This section of geomembrane was replaced with the Agru 40-mil microspike product and installed by New England Lining Systems of Connecticut. The installation of this new section is summarized below and the liner certification for the new piece is provided in Appendix D-1. A copy of the geotechnical testing reports for the existing and new FML pieces is included in Appendix D-2. The panel placement log for this replacement section is provided in Appendix D-3.

2.4.1 Conformance Testing of HDPE Geomembrane

The QA/QC report summarizing the testing information and results for the BATG installed FML is not available. As presented in CDM Smith's September 2009 report, the FML appeared to be of sufficient quality and installed in conformance with typical industry and MassDEP standards. The summary of evaluation of the existing FML conducted by CDM Smith based on site conditions is included in the correspondence in Appendix A.

For the approximate 1-acre FML replacement on the southern slope, the manufacturer, Agru, conducted the manufacturing quality control program for the HDPE geomembrane. Samples of the geomembrane were obtained by Agru from each roll. Testing was performed to verify conformance with project material specifications. Parameters tested included density, thickness, tensile strength, melt index, puncture resistance, and carbon black content. NEL performed their own quality assurance on the geomembrane and subcontracted TRI Environmental, Inc. (TRI) of Austin, Texas to test the HDPE for carbon black content, carbon black dispersion, tear resistance, tensile strength, thickness, and density. Agru also tested the polyethylene resin used to manufacture the geomembrane. Both the geomembrane and the resin tested met the project specifications.

2.4.2 Interface Friction Angle Testing

Direct shear testing was required at a frequency of one test per geomembrane type already installed on the landfill. Samples of the geomembrane were cut from the installed material to test the current installed condition of the geomembrane. The tests were conducted by TRI, in accordance with the ASTM D5321 methodology, performing the test at normal stresses of 200, 400, and 800 psf, with a displacement rate of 0.04 in/min. The shear analysis reported a peak friction angle of 37.8˚ for the Agru microspike geomembrane and a peak friction angle of 21.5˚ and 24.4˚ for the Solmax textured geomembrane.

The specifications required a minimum friction angle of 27˚, therefore the Solmax geomembrane located on the steep southern slopes was replaced with the Agru microspike geomembrane in order to achieve the minimum required interface friction angle. The Solmax brand geomembrane located in the northeastern portion of the landfill was not replaced because the area of the landfill it was installed on was at slopes of 5% and a short length of 3H:1V slope which had less failure potential due to less potential for build-up of stormwater head on the geomembrane.

2.4.3 Geomembrane Installation Inspection

Prior to cap construction completion, the entire landfill surface was inspected by CDM Smith and areas of stressed geomembrane were identified, as well as locations of rocks or debris located beneath the geomembrane and missing documentation of installation QA/QC information atop the geomembrane.

Prior to replacement installation of the 1-acre section of geomembrane on the south slope, the subgrade (gas venting/sand bedding layer) was inspected to insure an adequate surface free of stones, debris or any material potentially detrimental to the geomembrane. The replacement geomembrane was installed in one day. The existing section of geomembrane that required replacement was removed and disposed of off-site.

Based upon visual observation of the existing installed geomembrane and installation oversight of the replacement area of geomembrane, the geomembrane panels were overlapped so that the edge of an adjacent panel was placed over the previously deployed panel; 4-inches of overlap was required for hot shoe welding and a minimum of 3-inches for extrusion welding. All areas of the geomembrane that were damaged or blemished were repaired as required. NEL quality control personnel completed field documentation records following the panel placement, seaming, destructive and nondestructive testing, and repairs to the replacement geomembrane. During installation, CDM Smith provided oversight which included inspection of the geomembrane panels including: anchoring; alignment; overlap with adjacent panel(s); texture quality; thickness; identification (roll number and panel number); and panel length.

2.4.4 Geomembrane Trial Seams

Trial seams were performed on the geomembrane to verify the performance of the welding device and operator under the existing field conditions. Trial welds were required to meet the minimum strength requirements set forth in the specifications and summarized below in Table 2-1, prior to the start of any welding activities. Geomembrane trial welds were performed daily at the start-up and at four (4) hour (maximum) intervals thereafter. Any occurrence of a failing test required a repeat trial weld. A second failure required that two (2) passing tests be performed by the operator prior to production welding. A subsequent failure resulted in that particular welding device being taken out of service for that given day of work and until the device was adjusted or repaired. Each test seam was sampled and field tested for bonded seam strength (shear) and peel adhesion strength (peel). The test results were recorded on a trial weld data log which is included in Appendix D-4. Trial weld results for the initial geomembrane installation phases are not available. Peel and shear testing is summarized in Table 2-1 below.

Table 2-1
Trial Weld Seam Results Summary

Seam Property	Test Method	Minimum Requirements	Trial Seam Test Results Range
Shear Strength, ppi	ASTM D4437	80 ppi	95-115
Peel Strength[1], ppi	ASTM D4437	60 ppi	70-93
Peel Strength[2], ppi	ASTM D413	52 ppi	87-95

[1]Hot Wedge Fusion Weld

[2]Extrusion Weld

2.4.5 Geomembrane Field Seams

Welding of the geomembrane replacement area and other required repairs was performed by NEL employees in 2011. Double wedge fusion welding was the primary method used to weld geomembrane panel seams. Extrusion welding was used only for repairs and other special welding applications.

A detailed tracking process was used during the field welding. Each seam was identified with a unique seam number. It is speculated that Terrafix personnel recorded the following data for each seam which was also verified by the geomembrane inspector:

- Panel identification numbers joined by the seams;
- Date and time the seam was made;
- Seam length; and
- Specific welding device.

Appendix D-5 contains copies of the panel seaming forms for the geomembrane replacement and repair work conducted during the 2011 final cap completion construction project. The original panel seaming forms for the initial geomembrane installation phases are not available. However, panel installation information collected by CDM Smith post-installation and submitted to MassDEP previously is provided in Appendix A.

Inspection of the welding process consisted of visually observing the seaming operation to confirm that proper procedures were followed. Observations were made for the preparation of seams, the operating temperature of the welding devices, and the completed seams. The entire length of each seam was inspected for imperfections in the weld. Any imperfections found were marked and repaired according to the project specifications.

2.4.6 Non-Destructive Seam Testing

NEL was responsible for nondestructive testing of the total length of all geomembrane seams for the geomembrane replacement area. This process involved the testing of the complete length of all seams with an air pressure device for double fusion welds and a vacuum box for extrusion welds. Discontinuities that were detected were marked, repaired and retested for verification of seam integrity.

Air pressure testing of the annular space created by double wedge fusion welds involved the following procedures:

- Sealing the air channel (between the inside and outside tracks of the fusion weld) at both ends of the seam;
- Inserting a needle with a pressure gauge attached into the air channel at one end of the seam;
- Using a hand pump, inflating the air channel to between 25 and 30 psi; and
- Observing the pressure gauge over a five (5) minute period. A pressure drop of more than 4 psi was indicative of a defective weld.

The vacuum box used on this project was a rigid wall box with a clear plexi-glass top and an open bottom with a neoprene gasket. The gasket forms a seal between the box and the geomembrane. Vacuum box testing of extrusion welds or fusion welds from which the top flap from the panel overlap had been removed involved the following procedure:

- Applying a soapy water solution to the seam;

- Placing the vacuum box over the seam;
- Applying a vacuum of approximately 5 psi to the inside of the box for 15 seconds; and
- Observing the seam for air bubble formation which is indicative of a discontinuity in the seam.

Leaks or discontinuities detected in the seams were marked and subsequently repaired in accordance with the project specifications. All repairs were vacuum box tested for leaks by NEL personnel and witnessed by CDM Smith. Appendix D-6 contains the results from nondestructive testing of geomembrane welds for the geomembrane replacement area. Non-destructive testing results for the initial geomembrane installation phases are not available, however, this information was also collected by CDM Smith and submitted to MassDEP post-installation and is included in Appendix D and J. Additional vacuum testing was performed on an small area at the top of the landfill on seams identified by CDM Smith to have missing testing information written on the geomembrane from the previous installer. Repairs were made to areas that did not pass testing, as necessary.

2.4.7 Destructive Seam Strength Testing

The destructive testing of geomembrane welds for the geomembrane replacement area was performed in accordance with the project specifications. Seam samples were extracted and divided into three sections. One sample section was archived, one was tested in the field and the other was sent to the laboratory for testing. The laboratory and field welded sample sections were cut into ten (10) one inch wide specimens and were tested for bonded seam strength (shear) and peel adhesion strength (peel). The field sample was tested using a calibrated tensiometer.

A testing frequency of one destructive test per 500 linear feet of seam plus allowances for retesting for seam failures was performed.

All destructive tests were in compliance with the project specifications. Details of the destructive sampling are presented below.

2.4.7.1 Summary of Destructive Testing

Destructive test samples for the geomembrane replacement area were sent to GeoTesting Express, Inc., of Boxborough, Massachusetts for analysis. Five (5) destructive tests samples (DS-1 through DS-5) were submitted for laboratory analysis for the geomembrane replacement area. Samples tested were cut into ten (10) 1-inch wide test specimens, five (5) of each were tested for shear strength and peel strength of double wedge welds (peel of both weld tracks). Testing was run at a strain rate of 2-inches per minute for both peel and shear. The test specification for the 40-mil HDPE geomembrane required that at least four of five bonded seam specimens had shear strengths greater than or equal to 80 pound per inch (ppi) (width at yield), with failures occurring only as film tear bond (not in the seam). The peel samples were also required to meet a strength of at least 59 ppi (width at yield), with acceptable failures occurring only as film tear bond (not in the seam). NEL personnel were responsible for obtaining the destructive samples and for patching the resultant hole in the geomembrane. Test results were reviewed as they were obtained by CDM Smith. All destructive test samples for the geomembrane replacement area passed the required shear and peel testing.

Appendix D-7 contains copies of the certified laboratory reports. Each destructive test location is indicated on the panel layout plan located also in Appendix D-3. The destructive sample locations were repaired and re-tested in accordance with the project specifications under the observation of the geomembrane inspector. Appendix D-8 contains copies of the repair reports and D-9 contains copies of the in-field destructive test logs.

NEL kept a record of the repair locations including the following:

- The seam identification number;
- The date the seam was repaired;
- The non-destructive test results; and
- A description of the seam repair locations.

Based upon CDM Smiths 2009 inspection of the installed geomembrane, it appeared that fifty-four (54) destructive tests samples (DS-1 through DS-54) had been previously taken during the initial 3-phases of installation. However, no further information on the test results of these destructive samples is available due to the defaulting of the previous contractor BATG.

2.5 Drainage Layer

The drainage layer consisted of a double sided bi-planar geosynthetic drainage geocomposite. The geocomposite was installed by NEL in accordance with the project specifications. All quality control testing conducted on the geocomposite drainage layer was in accordance with the design and is summarized below.

2.5.1 Quality Control Testing

The manufacturer, GSE Lining Technology, LLC, (GSE) conducted the manufacturing quality control program for the geocomposite. Samples of the geocomposite were obtained by GSE from each roll. Testing was performed to verify conformance with project material specifications. Parameters tested included density, thickness, tensile strength, transmissivity, and carbon black content. GSE also tested the polyethylene resin used to manufacture the geonet. The geocomposite, geotextile and the geonet tested met the project specifications. The manufacturer's Certificates of Analysis and Roll Test Data Reports for the geocomposite rolls and resin material are included in Appendix E.

2.5.2 Conformance Testing

Conformance / quality assurance testing was performed by the completion contractor (J. Bates) as required by the contract specifications on the geocomposite. J. Bates subcontracted the independent Quality Assurance Laboratory, GeoTesting Express in Boxborough, Massachusetts to test the geocomposite for carbon black content, in-situ transmissivity, tensile strength, thickness, and density. Testing results were consistent with the data provided by the manufacturer and confirmed the geocomposite met the project specifications. The laboratory reports for the conformance testing are included in Appendix E.

2.6 Barrier Protection Layer

The barrier protection layer was placed in one 12-inch lift over the drainage geocomposite and compacted to 90 percent of the maximum dry density. All conformance testing and in-place testing conducted on the barrier protection layer was in accordance with the design and is summarized below.

2.6.1 Borrow Source Testing

The material used for the barrier protection material was the on-site soil stockpiles that were left on site from the previous contractor. The closure completion contractor, J. Bates, processed this material to meet the barrier protection layer geotechnical specifications.

This material was approved for use by MassDEP in correspondence date November 6, 2009. Environmental testing conducted on the existing material was conducted in December 2008 as discussed in and attached to the CDM Smith (then CDM) September 3, 2009 Landfill Closure Evaluation Report. Additional testing was conducted in 2011 to confirm soils in the perimeter access road and within the soil stockpiles were consistent with the data already collected. Environmental sampling was conducted for every 1,000 cubic yards of material and a total of 25 samples were collected. The analytical data for this material including both the 2008 and 2011 sampling events is included in Appendix F.

2.6.2 Conformance Testing

Conformance or quality assurance testing was performed on the barrier protection layer to confirm the material was consistent in meeting the project specifications. Geotechnical and environmental conformance testing and in-place testing requirements discussed in Section 2.6, is summarized in Table 2-2 below:

Table 2-2
Barrier Protection Layer Testing Summary

	Test	Frequency	Number of Tests Required[1]	Number of Tests Conducted
Conformance Testing	Grain Size Analysis (with hydrometer)	1/1,500 cy	11	11
	Moisture Density Curve	1/3,000 cy	5	5
	Permeability	1/3,000 cy	5	5
	Direct Shear	1/5,000 cy	4	3
In-Place Testing	Depth Confirmation	5/acre	38	48

[1]The number of tests required based upon the landfill area of 46,000 square yards (9.5 acres) and a layer depth of 12", for a total of 15,000 cubic yards.

All conformance testing was in accordance with the project specifications. Appendix F contains the geotechnical laboratory reports.

2.6.3 In-place Testing

Depth testing of the barrier protection layer was required at a minimum frequency of four test holes per acre. A total of 48 test holes were conducted over the 9.5 acre site. Appendix G contains a plan indicating the locations of each test hole conducted to confirm the depth of the barrier protection layer. These test hole depth results are summarized in Table 2-3 below and are shown in Appendix G.

Table 2-3
Barrier Protection Layer Depth Confirmation Summary Table

Test Locations	Depth Requirements	Depth Test Results Range
1-48	12" minimum	12"- 14"

2.7 Topsoil Layer

Following the installation of the geocomposite and the 12-inch barrier protection layer, the topsoil layer was placed in one 6-inch lift. The topsoil consisted of a mix of natural topsoil and compost. This soil was tested to confirm that the soil was in conformance with the project specification requirements for pH, organic content and grain size. All borrow source, conformance testing and in-place testing conducted on the topsoil layer was in accordance with the design and is summarized below.

2.7.1 Borrow Source Testing

Borrow source geotechnical and environmental testing was conducted at a frequency of one test per source and included sieve analysis, organic content, lead and PAH's. Specifications required that the topsoil layer to be a screened loam reasonably free from stumps, vegetation, roots, sticks, brush, heavy or stiff clay, stones equal or larger than 1-inch in diameter, gravel or other litter. One source was approved for the topsoil layer. The source of the topsoil was from a previously undisturbed site located off Route 20 in Charlton, Massachusetts, that was being cleared for development. Appendix G contains the geotechnical laboratory reports.

2.7.2 Conformance Testing

Conformance or quality assurance testing was performed on the topsoil layer to confirm that the material was consistent in meeting the project specifications. Geotechnical and environmental conformance testing and in-place testing requirements discussed in Section 2.7, is summarized in Table 2-4 below. Table 2-5 summarizes the results of the organics testing.

Table 2-4
Topsoil Testing Summary

	Test	Frequency	Number of Tests Required[1]	Number of Tests Conducted
Conformance Testing	Grain Size Analysis (to the #200 sieve)	1/1,000 cy	9	9
	Organics	1/1,000 cy	9	9

In-Place Testing	Depth Confirmation	4/acre	38	40

[1]The number of tests required based upon the landfill area of 46,000 square yards (9.5 acres) and a layer depth of 6", for a total of 9,000 cubic yards.

Table 2-5
Organics Testing Results Summary

Test	Requirements	Test Results Range
Organics	8-10 percent	8.7-9.9

All conformance testing was in accordance with the project specifications. Appendix G contains the geotechnical laboratory reports.

2.7.3 In-place Testing

Depth testing of the vegetative support layer was required at a minimum frequency of four test holes per acre. A total of 40 test holes were conducted over the 9.5 acre site, of which approximately 0.12 acres is not vegetated where there is gravel access road atop the landfill. Appendix G contains plans that include the measured depths of all the vegetative support layer test hole depths and the locations of each test hole.

Table 2-6
Topsoil layer Depth Confirmation Summary Table

Test Locations	Depth Requirements	Depth Test Results Range
1-25 34-48	6" minimum	6"- 7" 6.25"-7"

2.8 Drainage System

Stormwater from the site is intercepted by stormwater swales. Stormwater from the cap flows to an on-site drainage basin located in the west corner of the site that was constructed by the previous contractor, BATG. This basin was cleaned out and redefined as part of the interim site stabilization contract in 2009 and the final closure contract by J. Bates. Stormwater atop the cap flows to constructed mid-slope benches and swales which are directed to a piped downchute on the west side of the landfill to the basin. A toe of slope swale captures all other landfill runoff that is not intercepted by the mid-slope swales and benches and directs the stormwater to the basin. Runoff from the front of the site flows towards the wetland replication area located on the eastern side of the site. Drainage swales and benches were constructed in accordance with the revised design plans. Appendix B contains the record drawing of the final landfill grades and the mark-ups to the design plans.

2.9 Slope Stabilization and Erosion Control

Following the placement of the topsoil layer and the construction of drainage swales, the landfill slopes were hydroseeded. To prevent erosion, an in lieu of erosion control blankets, a bonded fiber

matrix was hydro-applied to the slopes immediately following seeding. The bonded fiber matrix and erosion control blanket was installed within the drainage swales for added erosion protection.

2.10 Environmental Monitoring Systems

As part of the CAD, verifications of the environmental systems including depth verification of the existing gas vents and confirmation of condition of existing groundwater monitoring wells were required. These items are discussed in the sections below.

2.10.1 Gas Vent Depth

As part of the Landfill Assessment and CAD modification process, MassDEP requested that the gas vent depths be confirmed. The total depth of the gas vents were measured and confirm that the depths extend into waste and close to bottom of refuse.

Table 2-7
Depth of Landfill Gas Vents

Gas Vent Number	Measured Depth[1]	Approximate Depth of Refuse[2]
GV-1	41’	30-40’
GV-2	30’	30-40’
GV-3	33’	40-50’
GV-4	42’	60-70’
GV-5	48’	45-55’
GV-6	17’	25-35’

[1]The measured depth is from geomembrane elevation.

[2]The approximated depth of refuse is interpolated based upon undisturbed topographical contours outside the limit of waste.

2.10.2 Groundwater Monitoring Wells

As part of the landfill assessment it was determined that four (4) existing groundwater monitoring wells were destroyed and not replaced by the previous defaulted Contractor, BATG. Replacement of these missing wells was included in the CAD. Replaced wells included the following: shallow side-gradient monitoring well MW-1S located to the north of the landfill; downgradient monitoring well couplet MW-2S and 2D located in the southwest corner of the site; and side-gradient deep well MW-3D (as part of a couplet) located to the southeast of the landfill. Appendix K contains the monitoring logs for the replacement wells.

Section 3
Certification

"I, Laura A. Bugay, attest under the pains and penalties of perjury that: (a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement; (b) based upon my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete; (c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; (d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information."

5/11/2015

Laura A. Bugay, P.E.
Massachusetts P.E. No. 47599

Section 4

Post-Closure Operations, Monitoring and Maintenance Plan

4.1 Post Closure Use

There are no post closure uses proposed at this time for the Landfill. A town fueling station was previously located on the landfill property at the site entrance however with the construction of a new municipal public works facility to the south of the landfill property, this fueling station has been decommissioned and will be removed from the site.

4.2 Proposed Post-Closure Environmental Monitoring

Based upon existing groundwater, surface water and gas monitoring sampling data, and in accordance with Regulations, a post-closure environmental monitoring program is proposed for the site. The program is generally consistent with the program already proposed and approved by MassDEP in January 2005. However, some minor changes are proposed herein as outlined below and in the attached Table 4-1.

The monitoring program includes semi-annual groundwater and surface water quality monitoring and quarterly perimeter landfill gas monitoring for the first 3 years. After the 3-year time period, if no perimeter landfill gas is detected at the compliance boundary and no new post-closure uses are approved at the site, a reduction of landfill gas monitoring to semi-annual will be proposed to MassDEP. The proposed post-closure monitoring program is further outlined in the attached Table 4-1.

4.2.1 Summary of Data

Based upon review of available monitoring data collected at the site since 1996, including data collected for the CSA, there have been no volatile organic compounds detected in the groundwater or surface water above drinking water standards and only dissolved concentrations of iron and manganese have been detected above their respective secondary drinking water standards in both groundwater and surface water samples. Also, no landfill gas has been detected in any of the six perimeter landfill gas probe locations.

4.3 Proposed Post-Closure Maintenance and Inspections

Post closure inspections will be completed on an annual basis in accordance with the Regulations by a third party, Massachusetts Registered Professional Engineer familiar with solid waste facilities. The condition of the landfill cap, vegetation, stormwater controls, environmental monitoring systems, landfill gas venting system and other site specific features will be inspected. Corrective measures will be identified in the report and discussed with the Town to implement with post-closure maintenance.

Post-closure maintenance includes the following items:

- Mowing the capped landfill at a minimum of once a year to prevent woody vegetation from growing on or near the cap that could compromise the integrity of the cap;
- Removal of accumulated sediment in the drainage swales and stormwater basin located in the west corner of the site, as necessary. Sediment shall be removed when accumulation occupies 25% of the total basin capacity;
- Removal of sediment from the drainage swale located at the front (east) of the site and downchute at the wetland replication area;
- Repair of erosion gullies on top of the cap and on slopes upgradient of or leading to surrounding wetlands;
- Re-seeding of vegetation on the landfill slopes, as necessary;
- Control of unauthorized access to landfill site; and,
- Maintain all gas vents and environmental monitoring systems in good working order; and,
- Complete work as recommended in the annual third party inspection reports.

4.4 Post-Closure Care

The mechanism in which the landfill will be cared for post closure will be Town funding appropriated as necessary.

A Notice of Landfill Operations will also be filed with the Registry in accordance with the regulations for the landfill property after MassDEP approves this Certification Report.

Table 4-1
Proposed Post-Closure Environmental Monitoring Program

Media	Proposed Sampling Program	Laboratory Analysis[2]	Proposed Change from Interim Sampling/Existing 2004 Post-Closure Monitoring Plan
Groundwater	Semi-annual sampling of 7 monitoring wells : *Side and Down-gradient* MW-1SR MW-2SR MW-2DR MW-3S MW-3DR *Up-gradient* MW-4S MW-4D	***Standard MassDEP parameters[1]*** *Field Parameters:* pH, Temperature, Dissolved Oxygen, Specific Conductivity *Indicator Parameters & Inorganics:* Alkalinity, Chloride, COD, Total Dissolved Solids, Nitrate-Nitrogen, Sulfate, Cyanide *Dissolved Metals:* Arsenic, Barium, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Selenium, Silver, Sodium, Zinc *Volatile Organic Compounds*: As listed in Method 8260 including compounds listed in 310 CMR 19.132.	No change.
Surface Water	Semi-annual sampling of 4 locations *Down-gradient* SW-1 SW-2 *Side-gradient* *SW-3* *Up-gradient* SW-4	***Standard MassDEP parameters[1]*** *Field Parameters:* pH, Temperature, Dissolved Oxygen, Specific Conductivity *Indicator Parameters & Inorganics:* Alkalinity, Chloride, COD, Total Dissolved Solids, Nitrate-Nitrogen, Sulfate, Cyanide, Hardness *Dissolved Metals:* Arsenic, Barium, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Selenium, Silver, Sodium, Zinc *Volatile Organic Compounds*: As listed in Method 8260 including compounds listed in 310 CMR 19.132.	Added hardness sampling in order to calculate hardness dependent metal criteria per guidance in the National Recommended Water Quality Criteria.
Landfill Gas	Quarterly sampling of four gas probes GP-1, 2,3,6	Methane (% by volume and lower explosive limit), Oxygen, Carbon dioxide, Hydrogen sulfide, VOCs	Sampling at previous locations GP-4 and GP-5 were eliminated as these locations were in close proximity to wetlands which act as a barrier to landfill gas migration.
Reporting	Reports due within 60 days of the sampling event.	N/A	Reporting is consistent with SWMR 310 CMR 19.000.

Notes:

1. Standard MassDEP parameters are those listed in Section 310 CMR 19.132 of MassDEP's Solid Waste Management Regulations (SWMR)
2. Acronyms: VOC: Volatile Organic Compounds;

Appendix A
MassDEP Approvals and Correspondence

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

Town of Charlton
37 Main Street
Charlton, MA 01507
Attention: Robin L. Craver, Town Administrator

Re: BWP – Charlton, UAO-CE-09-4005
Violations of M.G.L. c. 111 §§ 150A and 150A1/2, 310 CMR 10.00, 310 CMR 16.00, and 310 CMR 19.000

THE ATTACHED DOCUMENT IS IMPORTANT. FAILURE TO TAKE ADEQUATE ACTION IN RESPONSE TO IT COULD RESULT IN SERIOUS LEGAL CONSEQUENCES.

Dear Ms. Craver:

Attached is an ADMINSTRATIVE ORDER MassDEP is now issuing to the Town of Charlton (the "Town").

The Order contains a written description of (1) activities brought to the attention of MassDEP; (2) the statutory requirements violated; (3) the actions MassDEP now wants the Town to take to correct the violations; and (4) the deadlines for taking suction actions.

If the Town fails to take any action MassDEP now wants taken by the prescribed deadline, or if the Town otherwise fails to comply in the future with the requirements applicable to the Town, the Town could be subject to legal action. Such action could include referral to the Attorney General for criminal prosecution, court-imposed civil penalties, or civil administrative penalty, which may be assessed for every day from now on that the Town is in noncompliance with the requirements referred to above. Notwithstanding this Order, MassDEP reserves the right to exercise the full extent of its legal authority in order to obtain full compliance with all applicable requirements, including but not limited to civil action including court imposed civil penalties, or administrative penalties assessed by MassDEP.

Very truly yours,

Date: 8/27/09

for Martin Suuberg
Regional Director
Central Regional Office

cc: Charlton BOH
OE, Boston

W:\SWM\Towns\CHARLTON\Landfill (BATG)\Charlton UAO cvr ltr Aug 09.doc

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of: **Town of Charlton**	File No. UAO-CE-09-4005 **UNILATERAL ADMINISTRATIVE ORDER**

I. THE PARTIES

1. The Department of Environmental Protection ("Department" or "MassDEP") is a duly constituted agency of the Commonwealth of Massachusetts established pursuant to G.L. c. 21A, §7. MassDEP maintains its principal office at One Winter Street, Boston, Massachusetts 02108, and its Central Regional Office at 627 Main Street, Worcester, Massachusetts 01608.

2. The Town of Charlton (the "Town") is a duly organized municipality established pursuant to the laws of the Commonwealth of Massachusetts, having a mailing address at 37 Main Street, Charlton, Massachusetts 01507.

II. PRELIMINARY STATEMENT

3. This Order is issued pursuant to the authority vested in MassDEP by M.G.L. c. 111, §2C; M.G.L. c. 131, §40 and Wetlands Protection Regulations at 310 CMR 10.00; and M.G.L. c. 111, §§150A and 150A 1/2 and the Solid Waste Management Regulations at 310 CMR 19.000 and the Site Assignment Regulations for Solid Waste Facilities at 310 CMR 16.00. This Order requires the Town to take actions described herein to abate a potential threat to human health and

the environment posed by the incomplete closure activities at an inactive landfill in Charlton, Massachusetts, and to ensure the safe and complete capping and closure of the landfill. The actions required by this Order are intended to result in the safe capping of the landfill, to prevent the discharge of pollutants to air, water, and other natural resources of the Commonwealth, and to prevent the creation of a public nuisance.

III. STATEMENT OF FACTS AND LAW

4. The Department is responsible for the implementation and enforcement of M.G.L. c. 111, §§ 150A and 150A1/2, the Solid Waste Management Regulations at 310 CMR 19.000, and the Site Assignment Regulations at 310 CMR 16.00. The Department has authority under M.G.L. c. 111, § 2C to issue orders to any person in violation of any law or regulation the Department is authorized to enforce. In addition, the Department has the authority under M.G.L. c. 111, § 150A to issue orders to enforce the provisions of M.G.L. c. 111, § 150A, 310 CMR 19.000, and 310 CMR 16.00.

5. The Town owns an inactive, unlined, and uncapped municipal solid waste landfill (the "Landfill") located off Flint Road in Charlton, Massachusetts (the "Site"). The Town used the Landfill, which covers approximately 9.5 acres, to dispose of municipal solid waste from 1978 until February 1992. The Landfill is subject to the landfill closure and post-closure requirements set forth in the Department's solid waste regulations at 310 CMR 19.000 and the Department's Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites dated July 6, 2001 (the "Revised Guidelines").

6. In December 2004, the Town submitted an application to the Department for a Corrective Action Design permit (the "CAD Permit") to close the Landfill in accordance with the solid waste regulations and the Revised Guidelines. At about the same time, on December 15, 2004, the Town entered into a contract with BATG Environmental, Inc. ("BATG") to oversee all construction activities associated with the final closure and capping of the Landfill.

7. Because of technical deficiencies in the CAD permit application, the Town was given until October 28, 2005 to submit additional information to the Department to support the permit application. By letter dated October 28, 2005, the Town authorized BATG to implement corrective actions at the Landfill, even though the CAD Permit application was still pending.

8. On November 16, 2005, upon discovering that BATG was hauling truckloads of solid waste and soils to the Site and depositing them on top of the Landfill, MassDEP issued a Unilateral Administrative Order (UAO-CE-05-4001) requiring BATG to cease and desist from undertaking any corrective action at the Landfill until the Department issued the CAD Permit to authorize the work. The solid waste and soils brought to the Landfill were not of the type approved in the Revised Guidelines for use in closure activities, and included processed construction/demolition fine materials ("C&D fines").

9. On March 20, 2006, the Town and the Department entered into an Administrative Consent Order and Notice of Noncompliance that required the Town to submit a revised CAD Permit application, to establish a financial assurance mechanism ("FAM") to fund the complete

closure of the Landfill, and to complete the corrective actions approved by the Department by December 31, 2007.

10. On June 15, 2006, the Town executed a Contract Change Order with BATG, providing that BATG would fund the FAM for the Town. The Town elected to establish an Enterprise Fund as its FAM, pursuant to the Solid Waste Management Regulations at 310 CMR 19.051(12)(b).

11. On June 16, 2006, the Department issued the CAD Permit that authorized the Town, and BATG as the operator, to import 115,000 cubic yards of shaping and grading materials to the Site to close the Landfill. The CAD Permit established the design requirements for construction of gas venting, drainage, and vegetative support layers on the Landfill; established a deadline of 30 months to complete closure activities; and required the Town to establish the FAM before beginning construction activities. The CAD Permit allowed the Town to use the 12,000 cubic yards of unauthorized material that BATG had already brought to the Site, but only if the C&D fines were mixed with other materials before being used on the Landfill. The CAD Permit also prohibits the stockpiling of shaping and grading materials at the Site.

12. On January 29, 2007, MassDEP and BATG entered into an Administrative Consent Order with Penalty and Notice of Noncompliance (ACOP-CE-06-9035-46A) (the "2007 ACOP") to resolve the enforcement action against BATG for violations of solid waste, wetlands and industrial wastewater regulations at the Landfill observed by MassDEP on November 16, 2005. The 2007 ACOP required BATG to pay a penalty of $33,620.00, of which $17,000.00 was

suspended, and to mix the C&D fines with appropriate materials before using them for closure activities. In paragraph 18.C of the 2007 ACOP, BATG agreed to comply with the CAD Permit during all construction activities at the Landfill.

13. In August 2007, BATG again brought unauthorized materials to the Landfill to be used as shaping and grading material. MassDEP issued another Unilateral Administrative Order to BATG on September 7, 2007(UAO-CE-07-4001) for BATG's use of materials not authorized in the CAD Permit, and for stockpiling the materials at the Site in violation of the CAD Permit. The Department directed BATG to remove all of the unauthorized material from the Site and to provide proof of its legal disposal or reuse.

14. On January 18, 2008, the Department issued a third Unilateral Administrative Order to BATG (UAO-CE-08-6W001) for violations of the Wetlands Protection Act, G.L. c. 131, §40 and its implementing regulations at 310 CMR 10.00. Specifically, during an inspection on January 11, 2008, the Department observed the discharge of silt-laden runoff from unstable soils from the landfill capping activities that altered approximately ½ acre of bordering vegetated wetlands and two intermittent streams. The Department directed BATG to cease the discharge of silt-laden runoff and to implement erosion controls at the Site.

15. On March 31, 2008, the Department issued a fourth Unilateral Administrative Order (UAO-CE-08-4004) to BATG for its failure to provide the certification required under the CAD Permit that the shaping and grading materials had been placed at the Landfill in accordance with the requirements of the CAD Permit, and for failing to fully fund the FAM, as required in

paragraph 18.B of the 2007 ACOP. The Department directed BATG to cease accepting soils for shaping and grading at the Landfill; to provide certain analyses of the soils used for the gas venting layer; to complete the shaping and grading and provide the required certification to the Department; and to complete funding of the FAM. The Department also established new deadlines for the remaining construction activities related to the closure, superseding the deadlines in the 2007 ACOP.

16. On June 24, 2008, the Department issued a fifth Unilateral Administrative Order to BATG (UAO-CE-08-4009), which superseded the deadlines established in the prior Order, UAO-CE-08-4004.

17. On November 25, 2008, the Department and BATG entered into another Administrative Consent Order With Penalty and Notice of Noncompliance (ACOP-CE-08-6W005) (the "2008 ACOP"), addressing the violations of the Wetlands Protection Act described in paragraph 14 above. In the 2008 ACOP, BATG agreed to implement an Erosion Control Plan and a Wetlands Restoration Plan to correct the violations and to prevent future alterations of wetland areas. BATG also agreed to pay a $20,000.00 penalty, with an additional $5,000.00 suspended pending compliance with the 2008 ACOP.

18. On April 27, 2009, MassDEP personnel and the Charlton Board of Health Agent met at the Landfill and observed approximately fifteen piles of material stockpiled at the entrance of the Landfill. The material consisted of hard, clay-like mineral material with approximately five percent of the material consisting of construction and demolition waste. In addition, there was a

de minimus amount of solid waste mixed in. The CAD Permit prohibits stockpiling of materials at the Site.

19. On May 29, 2009, MassDEP personnel conducted a site visit at the Landfill and observed that the previous piles of material had been flattened and three new large piles of material were stockpiled at the entrance of the Landfill on top of the previously flattened material. The new material consisted primarily of the same clay-like mineral material as observed during the April 27, 2009 inspection with a small amount of humic material. Once again, MassDEP personnel observed that approximately five percent of the material consisting of construction and demolition waste along with a *de minimus* amount of solid waste mixed with the material. In addition, MassDEP observed that there had been no substantial work undertaken at the Landfill since the flexible membrane liner, ("FML"), was installed in 2008. The FML has remained exposed to the elements for several months, and is therefore at risk of damage or deterioration.

20. The Town has failed to comply with the terms and conditions of the CAD Permit, in violation of 310 CMR 19.081(1). Specifically, the Town has failed to complete the capping and closure of the Landfill within 30 months of the issuance of the CAD Permit. BATG, as the Town's contractor, has failed to comply with the extended deadlines for the closure activities contained in UAO-CE-08-4009, which required certification that all construction activity has been completed at the Landfill in accordance with the CAD Permit by October 30, 2008. The Department acknowledges that the Town's ability to complete the work required by the CAD Permit has been affected by the repeated and continued non-compliance of BATG, its contractor, as described above.

IV. DISPOSITION AND ORDER

21. For the reasons stated above, and pursuant to M.G.L. c. 111, § 2C; M.G.L. c. 111, §§ 150A and 150A 1/2; and M.G.L.c. 131, § 40, MassDEP hereby ORDERS the Town to take the following actions:

A. Within fifteen (15) days of this order submit to the Department the name of the construction company who will complete all remaining work associated with the capping and closure of the Landfill in accordance with the CAD permit and all local, state, and federal statutes and regulations. The Department anticipates that the construction of the final cap over the landfilled waste as required under the CAD permit can be completed on or before December 31, 2009.

B. Within fifteen (15) days of receipt of this Order provide to the Department confirmation that the FML has been sufficiently anchored to protect it from damage while the closure work is completed.

C. Within thirty (30) days of receipt of this Order provide to the Department confirmation that the stormwater has been re-channeled to the on-site detention basin and away from discharging to the wetlands.

D. Within seven (7) days of receipt of this Order submit an evaluation report prepared by a registered professional engineer, or other qualified professional approved by the Department regarding the feasibility of achieving an effective closure of the landfill structure. The evaluation report shall include the following:

1. Integrity of the existing FML including identification of repaired or damaged areas;

2. Condition of the existing passive gas venting system;

3. Determination of the usability of any soil stockpiled on site and, if necessary, plans to relocate excess soil;

4. Any proposed revisions to the approved CAD Permit required to address on-site conditions;

5. Adequacy of the existing stormwater retention basin and associated drainage system for the capped landfill;

6. Description of proposed steps to stabilize areas outside the extent of the existing FML such as the perimeter access road, stormwater detention basin, and the proposed wetland restoration area;

7. An updated cost estimate to complete the capping of the landfill;

8. A proposed schedule for completing the remaining construction activities related to implementing the CAD;

E. Within thirty (30) days of receipt of this Order submit adequate quality assurance/quality control information and testing data that demonstrates the flexible membrane liner component of the landfill cap installation was completed appropriately.

F. Within thirty (30) days of receipt of this Order complete a perimeter drainage/stormwater diversion system around the landfill to ensure that stormwater is contained within the landfill footprint.

Massachusetts Department of Environmental Protection

Adjudicatory Hearing Fee Transmittal Form

IMPORTANT! This form is intended for fee transmittal only. The contents of a request for an adjudicatory appeal (Notice of Claim) are established at 310 CMR 1.01(6) and the substantive statutes and regulations governing the Department's action.

A. Person/Party Making Request

1. Name and address of person or party making request:

Name - If appropriate, name group representative

Street Address

City | State | Zip Code

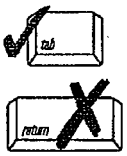
2. Project Information:

Street Address

City | State | Zip Code

DEP File or ID Number | $ Amount of filing fee attached

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



B. Applicant (if applicable)

1. Name and address of applicant:

Name - If appropriate, name group representative

Street Address

City | State | Zip Code

C. Instructions

1. Send this form and check or money order to $100.00 payable to the Commonwealth of Massachusetts to the MassDEP Lockbox at:

   Department of Environmental Protection
   P.O. Box 4062
   Boston, MA 02211

2. Send a **copy** of this form and a **copy** of the check or money order with the Request for Adjudicatory Appeal (Notice of Claim) to:

   Case Administrator
   Office of Appeals and Dispute Resolution
   One Winter Street
   Boston, MA 02108

CDM
One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: 617 452-6000
fax: 617 452-8000

September 3, 2009

Ms. D. Lynne Welsh
Acting Solid Waste Section Chief
Massachusetts Department of Environmental Protection
Central Region
627 Main Street
Worcester, Massachusetts 01608

Subject: Unilateral Administrative Order (UAO-CE-09-4005)
Flint Road Landfill
Charlton, Massachusetts
Initial Status Report

Dear Ms. Welsh:

On behalf of the Town of Charlton (the Town), Camp Dresser & McKee, Inc (CDM) is responding to the Unilateral Administrative Order (UAO) dated August 27, 2009 regarding the Flint Street Landfill in Charlton Massachusetts. Section IV - Disposition and Order requires the Town to complete several Action Items. Action Item 21 I requires the Town to submit an initial status report, prepared by a registered professional engineer, within seven days of receipt of this order that addresses Action Items A through H. This submittal responds to Action Item 21 I.

The attached table summarizes the status of each of the UAO required Action Items. Future progress reports will provide a status of the required UAO Action Items and the completion of the final landfill closure.

As noted on the table, paragraph 21A of the UAO requires the Town to provide the name of a construction contractor by September 11, 2009. The Town has requested an exemption to the Massachusetts procurement regulations to expedite the selection of the contractor. While the exemption has not yet been approved, the Town anticipates a requirement that an expedited procurement requiring soliciting of bids from three contractors. The preparation of design bid documents will require additional time. CDM is finalizing the procurement schedule and will keep your office aware of any revisions.

We are available to meet with your office regarding the information presented herein. Please do not hesitate to contact me at (617) 452-6541, if you have any questions or require further information.

Very truly yours,

Bruce W. Haskell

Bruce W. Haskell, P.E.
Camp Dresser & McKee Inc.

Attachments

cc: Board of Health, Charlton
Robin Craver, Town of Charlton
Jim Philbrook, Charlton
Laura Bugay, CDM
Chris Koehler, CDM

Initial Status Report
Summary of Required Tasks
for Unilateral Administrative Order[a]
Between the Town of Charlton and the Massachusetts
Department of Environmental Protection
As of September 3, 2009

Consent Order Paragraph	*Description*	*Due Date*[a]	*Status*
Section IV. Paragraph 21A.	Submit name of closure completion Contractor.	September 11, 2009.	IN PROGRESS. Need waiver from State bidding laws.
Section IV. Paragraph 21B.	Confirm that FML is temporarily anchored.	September 11, 2009.	IN PROGRESS. Temporary anchor plan being developed.
Section IV. Paragraph 21C.	Confirm stormwater has been re-directed to basin.	September 26, 2009.	IN PROGRESS. Temporary stabilization and erosion control plan being developed.
Section IV. Paragraph 21D.	Submit evaluation report.	September 3, 2009.	COMPLETED. Submitted on September 3, 2009.
Section IV. Paragraph 21E.	Submit FML installation information.	September 26, 2009.	IN PROGRESS. QA/QC information requested.
Section IV. Paragraph 21F.	Complete perimeter drainage system.	September 26, 2009.	IN PROGRESS. Temporary stabilization and erosion control plan being developed
Section IV. Paragraph 21G.	Provide cleanout and reconstruction plan for drainage basin.	November 25, 2009	IN PROGRESS.
Section IV. Paragraph 21H.	Stabilize perimeter access road.	November 25, 2009	IN PROGRESS. Temporary stabilization and erosion control plan being developed.
Section IV. Paragraph 21I.	Submit initial status report.	September 3, 2009.	Completed. This report satisfies requirement; submitted September 3, 2009.
Section IV. Paragraph 21J.	Submit monthly status reports.	Due the 15th of every month.	Next report to be submitted September 15, 2009.

[a]Due dates reflect Unilateral Administrative Order (UAO) received August 26, 2009.

CDM

Town of Charlton, Massachusetts

Landfill Closure Evaluation Report

September 3, 2009

Report

CDM
One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: +1 617 452-6000
fax: +1 617 452-8000

September 3, 2009

Ms. D. Lynne Welsh
Acting Solid Waste Section Chief
Massachusetts Department of Environmental Protection
Central Region
627 Main Street
Worcester, Massachusetts 01608

Subject: Response to Unilateral Administrative Order (UAO-CE-09-4005)
Flint Road Landfill, Charlton
Landfill Closure Evaluation Report

Dear Ms. Welsh:

On behalf of the Town of Charlton (the Town), Camp Dresser & McKee, Inc (CDM) is responding to the Unilateral Administrative Order (UAO) dated August 27, 2009 issued by the Massachusetts Department of Environmental Protection (MassDEP) regarding the Flint Road Landfill (Landfill) in Charlton Massachusetts. Section IV - Disposition and Order of the UAO requires the Town to complete several Action Items. Action Item 21(D) requires the submission of an evaluation report, prepared by a registered professional engineer, within seven days of receipt of this order (on or before September 3, 2009) that addresses the feasibility of achieving an effective closure of the landfill. This submittal is the response to Action Item 21(D) in the UAO.

Existing Site Conditions

The MassDEP issued a Corrective Action Design (CAD) permit application approval dated June 20, 2006 to the Town of Charlton for the closure of the Landfill (copy of approval included in Attachment A to this letter). This approval allowed the acceptance of up to 115,000 cubic yards (CY) of MassDEP approved shaping and grading materials to be placed in accordance with procedures and plans prepared by Tata and Howard, Inc. The approved plans also required the construction of a cap consisting of a 40-mil thick high-density polyethylene (HDPE) membrane and other soil layers in compliance with MassDEP's Solid Waste Management Regulations (310 CMR 19.000, the Regulations).

The Town entered into an Agreement with a private firm to accept the shaping and grading materials and construct the final cap in accordance with the CAD permit approval. As required in the permit application and the Regulations and associated guidance documents, a Financial Assurance Mechanism (FAM) was established in an escrow account to cover the costs estimated by this contractor to construct the final cap over the landfill. The amount established by the contractor and approved by MassDEP for the FAM was approximately $1 million.

Subsequent to the completion of the receipt of shaping and grading materials at the Landfill, the contractor constructed the following components of the final cap:

1. Stormwater retention basin located along the western portion of the site
2. Placement of the shaping and grading materials under the HDPE membrane and the materials placed outside the membrane
3. Gas venting and bedding layer under the HDPE membrane
4. Gas vents installed through the shaping and grading materials into the historic landfill
5. HDPE membrane over the areas shown as requiring a final cap.

The installation of items listed above was not witnessed by CDM but the current conditions and available information are discussed in detail below.

There are several items such as a perimeter access road, stockpiles of unsuitable material on top of the HDPE membrane, and stockpiles of materials containing debris outside on-site that were not approved by MassDEP as part of the CAD. There are also slopes that exceed the three horizontal to one vertical (3H:1V) maximum allowed by the Regulations and the approved stormwater collection systems on the cap were not installed. Finally, due to a lack of maintenance by the contractor, there are several wetland resource areas where siltation from the operations has collected that will likely require remediation and restoration.

Detailed Response to Specific Action Items

Action Item 21(D) of the UAO requires the following:

> *"Within seven (7) days of receipt of this Order submit an evaluation report prepared by a registered professional engineer, or other qualified professional approved by the Department*

regarding the feasibility of achieving an effective closure of the landfill structure. The evaluation report shall contain:

1. *Integrity of the existing FML including identification of any repaired or damaged areas;*
2. *Condition of the existing passive gas venting system;*
3. *Determination of the usability of any soil stockpiled on site and, if necessary, plans to relocate excess soil;*
4. *Any proposed revisions to the approved CAD Permit required to address on-site conditions;*
5. *Adequacy of the existing stormwater retention basin and associated drainage system for the capped landfill;*
6. *Description of proposed steps to stabilize areas outside the extent of the existing FML such as the perimeter access road, stormwater detention basin, and the proposed wetland restoration area;*
7. *An updated cost estimate to complete the capping of the landfill;*
8. *A proposed schedule for completing the remaining construction activities related to implementing the CAD."*

The following is a detailed response to each of these items related to implementing an effective closure of the Landfill. A series of photographs of the existing conditions taken by CDM during a site visit on June 26, 2009 are included in Attachment B to this letter.

Integrity of Existing FML

A 40-mil HDPE textured HDPE Flexible Membrane Liner (FML) was installed in late fall 2008 and early spring 2009 by a qualified membrane installer (Terrafix Inc.). Photos 14 through 49 focus on the HDPE liner as installed. Per the approved cap cross-section in the CAD permit, the FML was to be underlain by a 6-inch thick gas venting/bedding layer. This layer was to have a permeability greater than 1×10^{-3} cm/sec and be essentially free of any stones or sharp materials that could potentially damage the FML. The contractor who was previously constructing the cap submitted a source of sand for the gas venting/bedding layer to MassDEP. A copy of the letter with the source test results is provided in Attachment C to this letter. This material as submitted meets the MassDEP approved requirements for the gas

venting/bedding layer. CDM does not have any test results for materials as delivered to the site. However, when CDM was on-site for a small portion of the liner installation in December 2008, the sand that was placed under the FML installed at that time was visually similar to the sand proposed in the letter in Attachment B.

To evaluate the existing condition of the FML as installed, CDM walked the FML seams and visually inspected repair areas, anchor trenches, and established that the FML was installed in accordance with standard industry practices and typical FML installation specifications for MassDEP landfill closures. When CDM was on-site in December 2008 to witness a small area of liner installation, the work was performed in accordance with these standard practices. In general, there was no visible evidence of wind damage or uplift and the FML appeared to be in good condition. The following are some general observations about the condition of the FML:

- The installed FML is 40-mil high-density polyethylene (HDPE) textured or micro-spiked liner from two manufacturers - AGRU America and Solmax International (see photos 16, 17, and 20).

- Non-destructive quality assurance/quality control (QA/QC) data (time and pressure) for the testing of wedge seams is documented directly onto the FML panels (see photo 19). Vacuum box QA/QC data for the testing of extrusion welds and repair areas is also documented directly on the FML. Documenting QA/QC data directly onto the FML using crayon or marker is a standard practice of quality FML installers (see photos 19, 21, 25, & 33).

- Destructive testing samples were collected at regular intervals (e.g. typically taken every 500 linear feet of wedge seam). The destructive test required a 3-foot x 1-foot sample be cut from the wedge seam. The destructive test areas were then repaired/patched using an extrusion weld and tested via a vacuum box. Destructive test locations are typically documented on the FML as "DS-52" (i.e. Destructive Sample 52 - see photo 21). During CDM's site inspection, repairs areas for destructive tests were observed. This evidence suggests that the destructive testing was performed in accordance with standard industry practice.

- Panel placement information is also documented directly on the installed FML. The information recorded typically includes the panel number, the date of installation, and the last four digits of the FML roll. Photo 33 shows the typical panel placement

documentation. This information is recorded in a log and a panel placement plan is developed with all documentation.

Although the FML appears to be installed in accordance with acceptable industry practices, some additional work and minor repairs are needed. Specifically:

- The HDPE boots that seal the landfill gas vents were not installed (see photo 18). Installation of the gas vents boots as shown on the approved CAD detail is required.
- The anchor trench along the perimeter access road has experienced erosion and will require repair/reconstruction (see photos 15 and 48 through 51).
- Several panels installed on the south-west slope were observed to have some small creases, which appear to be related to the handling/deployment of the geomembrane roll prior or during installation. Some creases will need reinforcement (see photo 40).
- Several seams may also need reinforcement as welds were misaligned.
- An overall cleanup of debris left on the FML is also necessary prior to placing any cover soils or geosynthetics (see photos 27, 28, 29, 35, 37, 38, and 39).

To comply with UAO Action Item 21 (E), the Town must, "*...submit adequate quality assurance/quality control information and testing data that demonstrates the flexible membrane liner component of the landfill cap was completed appropriately.*" As MassDEP is aware, the QA/QC report summarizing the testing information and results for the FML is not available to the Town at this time. The Town is making efforts to obtain this information for submittal to meet this deadline. However, in order to meet the requirements of the UAO, the Town may have to begin covering the FML with the other drainage materials before the FML QA/QC report is received. It may also be possible that the FML QA/QC report will never be received.

CDM believes that the HDPE FML was installed in conformance with industry and typical MassDEP requirements. Without significant effort, expense and time to recreate the destructive and seam testing, the Town cannot currently certify in accordance with the Regulations that the FML was installed in accordance with the approved CAD. While the Town continues to attempt to obtain this information along with the associated warranties from the installer, CDM requests MassDEP's concurrence that the FML will be accepted after the above listed minor repairs are conducted even if the available testing is never received.

Condition of Existing Passive Gas Venting System

As required by the June 2006 CAD approval, six passive landfill gas vents were installed at the landfill. The vent pipes were capped with vented "candy canes" and extended approximately 8-feet above the ground surface (see photos 31 & 32). The vent locations are shown on the existing conditions survey. According to the approved CAD, the vents were to be drilled to the bottom of refuse or groundwater, whichever was encountered first.

Given that the Landfill stopped operating in 1978, the generation of landfill gas has decreased to minimal levels. CDM has also not observed any "bubbling" of gas under the FML since it was installed. However, because the edge of landfilled waste is close to the northern property line, it is important to confirm that the vents extend into the landfilled solid waste as originally specified to allow any generated gases a potential pathway to vent. It should be noted that a drilling firm installed the vents but that the installation records are not currently available to the Town.

To verify the condition of the gas vents, CDM will measure the concentrations of methane in the vent pipes. If there are detectable concentrations of methane found above five percent of the Lower Explosive Limit (LEL), CDM assumes that the well was installed in the historic waste and that the vent is functioning. If one or more vent does not have a concentration of methane below the five percent of the LEL, CDM will conduct a program on one vent to verify the depth. At the selected vent, the pipe will be sawed off and a tape measure dropped inside the 6-inch PVC pipe to measure the depth of the vent. The measured depth will be compared to available information about the depth of landfilled waste and/or groundwater. After the depth is confirmed, the PVC can be reconnected using a 6" x 6" PVC coupling.

If it is determined that the single tested well was not installed into the landfilled solid waste, CDM may repeat this procedure with other vent(s) and provide MassDEP with a separate proposal to augment the gas system. Additional steps that can be evaluated will range from supplemental monitoring along the northern property line to the installation of additional vents.

As noted above, the gas vent boots need to be installed at the connection of the boot and the FML (see photo 18). However, based on CDM's surficial observations, the gas vents appear are in good condition.

Usability of Soil Stockpiled On Site

There are two large soil stockpiles located in the northeast corner of the site and three small stockpiles located in the southeast corner of the site (see photos 1, 5, and 6). The stockpiles were observed to be a dark sandy-silty material, with some larger rocks, boulders and debris. Based upon the existing conditions survey conducted in August 2009, these two stockpiles contain approximately 23,500 CY of soil.

In December 2008, CDM collected and analyzed ten composite samples of the soil stockpiles. These samples were submitted to Alpha Analytical Laboratories for laboratory analysis of Extractable Petroleum Hydrocarbons (EPH) with Polcyclic Aromatic Hydrocarbons (PAHs) and RCRA-8 Metals. The results were compared to S-1/GW-1 standards as established in the Massachusetts Contingency Plan (MCP, 310 CMR 40.000). Lab data sheets and a summary table are provided in Attachment D to this letter.

Detected concentrations of constituents in the ten samples did not exceed their corresponding S-1/GW-1 standards established in the MCP. A few PAHs had detection limits that slightly exceeded their S-1/GW-1 standard but the differences are not significant.

There are two other areas where soils have been placed at the site that may require regrading and disposal. One is the entrance area around the former weigh scale where soils were placed during the period when shaping and grading materials were accepted and where the site contractor recently had additional piles of soils placed. The other area is the perimeter access road that was constructed from soils that are visually similar to those that were analyzed by CDM.

Because the FML has already been constructed, it is not possible for the stockpiled soils to be placed under the final cap. Because testing conducted to date on the stockpiled soils did not exceed MassDEP's S-1/GW-1 standards, CDM is proposing the following procedures to utilize and stabilize the stockpiles:

1. A quantity of the two larger stockpiles will be processed by screening out stones, boulders and debris to allow them to be incorporated into the revised final cap discussed below. CDM estimates that the alternative cap will allow for the re-use of up to 16,000 cubic yards of in-place processed soil.

2. The excess soils from the regrading of the perimeter access road, any excess soils from the site entrance, screenings from the soils used in the cap and any remaining soils from the two larger stockpiles will be relocated to the location shown on the attached

site plan. This remaining pile will be graded so that no slopes are steeper than 3:1, covered with 4-inches of topsoil, and seeded.

3. The plan prepared for the Notice of Landfill Operations (NOLO) for the site that is required by the Regulations will include information on the location of these soils with a limitation on excavation in these areas without prior approval from MassDEP. This condition will be similar to that for the future excavation in the capped areas of the site.

CDM does not propose any further laboratory testing of any soils currently on-site at the Landfill.

Proposed Revisions to the Approved CAD Permit

As outlined above, current Landfill conditions are different than those included approved by MassDEP in the June 2006 CAD permit. The most significant differences in the existing site are the slopes that are steeper than 3H:1V; the perimeter access road; the additional shaping and grading materials delivered in excess of 115,000 cubic yards; establishment of the edge of landfilled waste; and the lack of stormwater control swales and down-chutes installed along the western slopes of the site. All of these require modifications to the 2006 CAD to achieve an effective closure of the Landfill. The proposed revisions to address each of these items are outlined below:

- Cap Cross-Section. The updated existing conditions survey conducted in August 2009, indicated an average slope of 2.7H:1V, with a maximum side slope of 2.5H:1V. The cap cross-section approved in the 2006 CAD is MassDEP's standard cap for solid waste landfills and would have been appropriate on the 3H:1V maximum slopes allowed by the Regulations with the stormwater controls proposed for the capped areas. However, that cap cross-section will not be stable on the existing side slopes and the standard cross-section requires modification.

  CDM proposes to utilize an alternative cap cross-section as shown on sheet D-1 of the attached plans. This cross-section replaces the sand drainage layer above the FML with a synthetic drainage net. This synthetic net will be covered by a 12-inch minimum thick layer of soils processed from on-site stockpiles and a 6-inch thick topsoil layer that will be seeded. To maintain the slopes while the vegetation is established, the topsoil will be covered with an erosion control mat.

- Perimeter Access Road. The 2006 plans do not show the perimeter access road that was constructed around the northern and southern sides of the Landfill. As shown on the attached photographs, this erosion of the road along the edge that abuts the FML and its outer slope are a significant source of silt into the abutting wetland resource areas. To address this area and the requirement of the UAO (Action Item 21 (C)), CDM has developed the details shown for the access road shown on sheet D-1 of the attached plans.

- Shaping and Grading Materials in Excess of Approval. The updated survey show that the quantity of shaping and grading materials within the limits of the existing FML significantly exceed the 115,000 cubic yard limit established by MassDEP. CDM is not proposing to conduct any relocation or removal of these materials.

- Establishment of Edge of Landfilled Waste. The FML installed at the site today is to the same limits as that shown on the design plans contained in the 2006 CAD approval. These plans also showed the relocation of waste from certain areas and the consolidation of the landfill. CDM is assuming that the FML covers all the historically landfilled waste and that no further investigations are required to delineate the existing edge or confirm that the historic waste relocation was performed.

- Revisions to Stormwater System on Capped Areas. The stormwater benches and down-chutes shown on the 2006 CAD were not constructed into the subgrade. To provide a stable slope, the details for the installation of the benches need to be built up on top of the existing FML. Details for this are shown on the attached sheet D-1 of the plans. In addition, the proposed rip rap down-chutes will be replaced with a slope pipe to direct stormwater run-off towards the existing detention basin.

Sheet D-1 of the attached plans shows preliminary typical details for these modifications. If the approach to each of these is acceptable, CDM will provide MassDEP with specifications for specific materials, testing requirements and any required design calculations for each item.

Adequacy of Existing Stormwater and Drainage System

A stormwater detention basin was constructed in the western side of the site (see photo 61). This basin appears to have been constructed in accordance with the 2006 CAD plans. Currently, there is significant sediment accumulation and standing water was observed in the basin, and the western side of the basin was eroded and sedimentation was observed in the downgradient wetland. The revisions required to the stormwater collection system on top of the Landfill are discussed above. The perimeter stormwater collection system along the

perimeter access road has currently failed and is allowing untreated stormwater to be discharged into the wetland resource areas. To address these issues, the following measures will be taken:

- Stormwater Detention Basin. The detention basin will be repaired and existing sediment removed. Removed sediment will be placed in the soil stockpile disposal area described above. Based on a comparison of the recently completed existing conditions plan, the basin appears to have been constructed in general accordance with the 2006 CAD plan. Also, the basin is wedged between the slopes of the Landfill and the wetland resource areas and there is limited space for any expansion. Therefore, CDM is not proposing to redesign or revise the location or size of the existing basin.

- Construction of Perimeter Drainage Swales. The construction contractor to be retained by the Town will repair and reconstruct the existing anchor trench and the associated perimeter drainage swales to redirect stormwater to the basin. Details for the construction of the perimeter anchor trench are shown on Sheet D-1 of the attached plans.

  The plan details also show how this contractor will also stabilize the perimeter access road and stabilize the slopes below the perimeter access road. The existing access road along the southern side of the Landfill will largely be loss to stabilize the outside slopes. The perimeter road along the northern side of the Landfill will be maintained at a lesser width to allow the side slopes to be stabilized.

Proposed Steps to Stabilize Areas Outside Existing FML

As required by Action Item 21(A), the Town is working to hire a construction contractor who will complete the remaining capping and closure work. The contractor's first priorities will be to repair and reconstruct the existing anchor trench, repair the detention basin, redirect stormwater to the basin, stabilize the perimeter access road, and stabilize the slopes below the perimeter access road.

The following specific items are proposed to immediately repair and stabilize the site in order to control stormwater, reduce further erosion, and reduce further impact to the surrounding wetlands:

- Repair or replace hay bales and silt fencing and other erosion control barriers, as necessary. It should be noted that given the large amount of siltation already in the surrounding wetlands, the construction contractor will selectively place new haybales and silt fence to mitigate further damage to the resource areas;

- Repair the perimeter access road re-grading to pitched inward, towards the Landfill;
- Reconstruct the perimeter access road anchor trench and construct a perimeter access road swale that will direct stormwater runoff to the stormwater basin;
- Repair and reconstruct the stormwater detention;
- Stabilize all areas below the perimeter access road using loam, seed, and erosion control matting.

Finally, as discussed above, there is a significant area of wetlands where sediment has accumulated due to the operations of the shaping and grading materials contractor. The restoration of these wetland areas will be addressed separately after the landfill cap is completed.

Updated Cost Estimate

CDM is preparing an updated construction cost estimate to complete landfill capping and closure. The estimate assumes that the FML installed is in an acceptable condition requiring only minor repairs and the on-site soil stockpiles on site are acceptable for use as the barrier protection layer above the FML. CDM's initial estimates are that the total cost for cap construction will exceed the $1 million currently held in the FAM. The final estimated cost will be provided to MassDEP under separate cover. The Town is currently evaluating approaches to obtain the additional funding.

Proposed Schedule for Completing the Remaining Construction Activities

Per the requirements of the UAO, the Town is submitting a monthly progress report to MassDEP summarizing the status of the required tasks. The Town will utilize these progress reports to keep MassDEP aware of the status of the various tasks.

The UAO does not include a specific date for completion of the landfill cap. The Town's approach is to prepare construction documents to retain a contractor who will complete the site stabilization tasks with required dates in the UAO and the landfill closure. Because of an anticipated requirement to solicit bid prices from at least three contractors and the need to complete cap construction no later than October 15th to allow vegetation on the slopes to be established, CDM does not anticipate that construction of the cap will completed in 2009. CDM will provide updates on the capping schedule including a discussion of interim measures to stabilize existing cap as part of the monthly progress reports.

Summary of Findings

To prepare this response, CDM conducted a review of existing site conditions including preparation of an updated existing conditions plan and believes that closure of the Landfill can be completed in substantial compliance with Solid Waste Management Regulations (310 CMR 19.000). As discussed above, CDM's findings are that the Landfill closure can be completed with the following assumptions:

1. While the Town continues to pursue the QA/QC results for the HDPE FML, CDM requests that MassDEP concur that the FML was installed in accordance with standard practices by a competent installer and that the Town can receive final approval of the landfill cap if the QA/QC results for the FML are never made available.

2. Source test results for the sand gas venting/bedding layer that complied with the previous CAD approval were submitted previously to MassDEP. No further testing is available and the Town requesting that, since confirming the thickness and type of sand used for this layer would require removal of the FML, the MassDEP waive any requirements for any further measurement and testing of this layer beyond the results presented in Attachment C.

3. CDM proposes to evaluate the depth of landfill gas vents as installed and outlined above. If the depth of the single vent is to groundwater or the bottom of waste as estimated based on a review of historic information, CDM requests that MassDEP accept that all six gas vents have been installed in accordance with the previously approved CAD.

4. CDM requests that MassDEP approve the proposed alternative cap cross-section that allows for the use of the on-site soils and will be stable on the existing slopes that exceed MassDEP's maximum standard of three horizontal to one vertical.

5. CDM has not witnessed any test pits or other investigations conducted to confirm the edge of landfilled waste or the waste relocation proposed in the 2006 CAD. The existing limit of the FML needs to be considered as the edge of landfilled waste and no further delineation investigations are proposed.

6. CDM requests that MassDEP approve the use of the stockpiled materials on the site on top of the existing HDPE membrane. CDM has collected ten samples of the soil from the two largest stockpiles and had them analyzed for metals and EPH with PAHs. Detected concentrations in these samples were below MassDEP S-1/GW-1 standards

as outlined in the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000). CDM proposes to utilize these materials in the alternative cap discussed above and permanently place any excess soil as well as trailings from any screening operations at the location shown on the attached plans.

7. MassDEP approves the proposed revisions to the previously approved CAD as shown that address changes to the proposed stormwater collection system; acceptance of slopes steeper than three horizontal to one vertical; regrading of the perimeter access road; and acceptance of shaping and grading soils beyond the 115,000 cubic yards approved in the 2006 CAD approval.

8. Any required remediation and restoration of wetland resource areas, including the proposed replication area shown on the approved CAD plans will not be addressed until the landfill is stabilized and capped as described herein.

As you understand, to complete of the tasks outlined in the UAO and the final cap will require the expedited review and approval by MassDEP of many of these items. To meet these schedules, we are available to meet with your office regarding the information presented herein. Please do not hesitate to contact me at (617) 452-6541, if you have any questions or require further information.

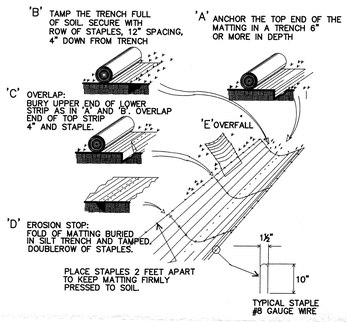
Very truly yours,

Bruce W. Haskell

Bruce W. Haskell, P.E.
Camp Dresser & McKee Inc.

Attachments

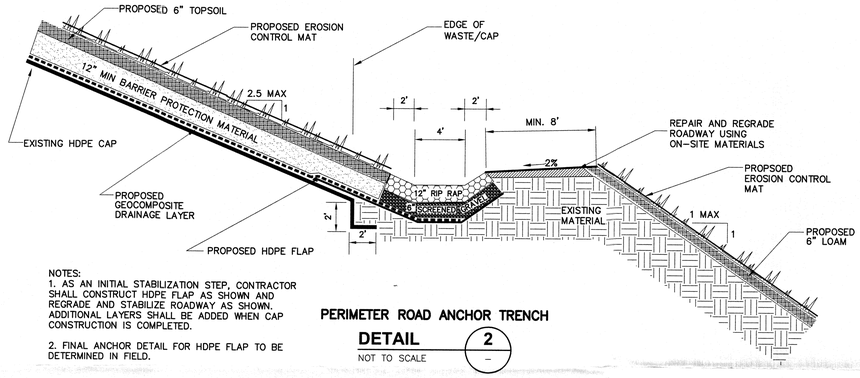
cc: Ms. Robin Craver, Charlton
Board of Health, Charlton
Jim Philbrook, Charlton
Ms. Laura Bugay, P.E. CDM
Mr. Christopher Koehler, P.E. CDM



EROSION CONTROL BLANKET PLACEMENT

DETAIL 1

NOT TO SCALE



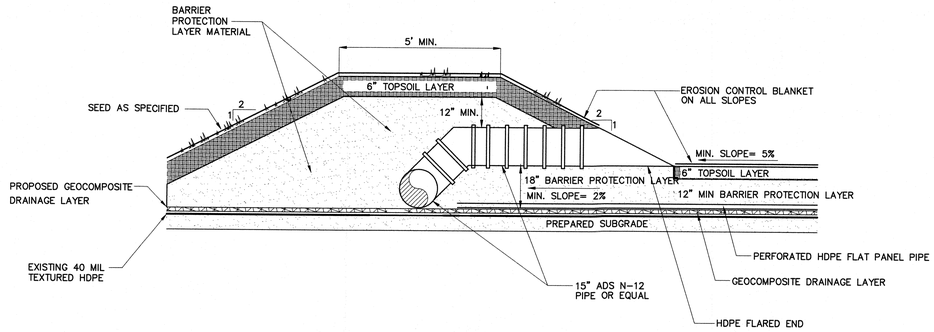
NOTES:
1. AS AN INITIAL STABILIZATION STEP, CONTRACTOR SHALL CONSTRUCT HDPE FLAP AS SHOWN AND REGRADE AND STABILIZE ROADWAY AS SHOWN. ADDITIONAL LAYERS SHALL BE ADDED WHEN CAP CONSTRUCTION IS COMPLETED.

2. FINAL ANCHOR DETAIL FOR HDPE FLAP TO BE DETERMINED IN FIELD.

PERIMETER ROAD ANCHOR TRENCH

DETAIL 2

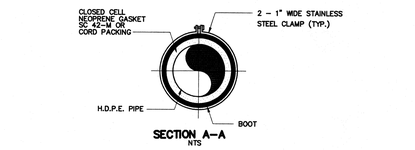
NOT TO SCALE



SECTION VIEW

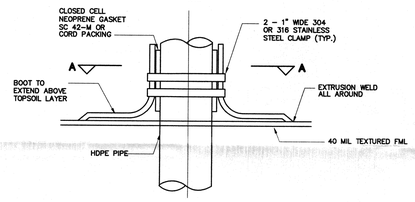
HDPE DRAINAGE SWALE INTERSECTION

N.T.S.



SECTION A-A

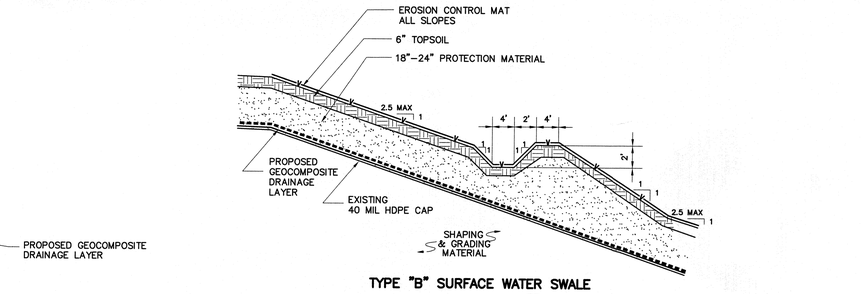
NTS



PIPE PENETRATION SEALING DETAIL

DETAIL 5

NOT TO SCALE



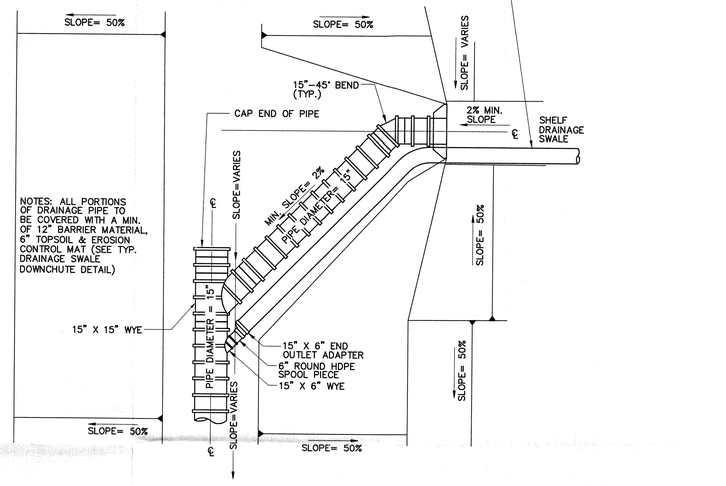
NOTES:
1. AS AN INITIAL STABILIZATION STEP, CONTRACTOR SHALL CONSTRUCT HDPE FLAP AS SHOWN AND REGRADE AND STABILIZE ROADWAY AS SHOWN. ADDITIONAL LAYERS SHALL BE ADDED WHEN CAP CONSTRUCTION IS COMPLETED.

2. FINAL ANCHOR DETAIL FOR HDPE FLAP TO BE DETERMINED IN FIELD.

PERIMETER BERM ANCHOR TRENCH

DETAIL 3

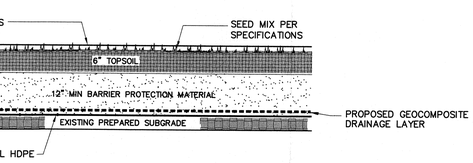
NOT TO SCALE



HDPE DRAINAGE PIPE DRAINAGE SWALE INTERSECTION

DETAIL 4

NOT TO SCALE



TYPICAL FINAL CAP SECTION

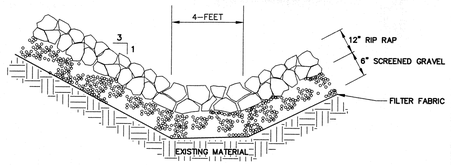
DETAIL 6

NOT TO SCALE

TYPE "B" SURFACE WATER SWALE

DETAIL 7

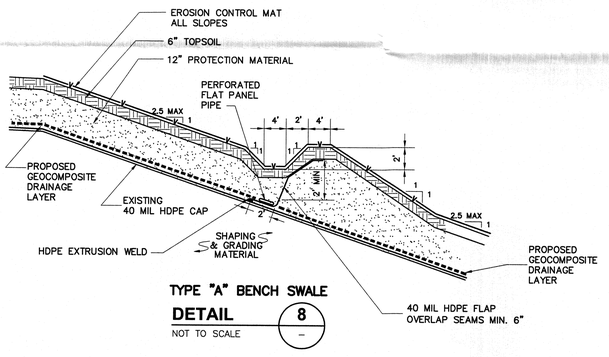
NOT TO SCALE



TYPICAL RIP RAP CHANNEL

DETAIL 9

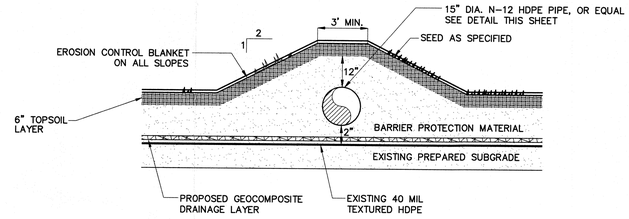
NOT TO SCALE



TYPE "A" BENCH SWALE

DETAIL 8

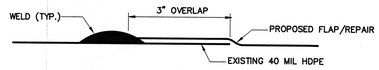
NOT TO SCALE



HDPE DRAINAGE SWALE DOWNCHUTE

DETAIL 10

NOT TO SCALE



HDPE WELD DETAIL

DETAIL 11

NOT TO SCALE

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: C. KOEHLER
DRAWN BY: M. TOUAYL
SHEET CHK'D BY: C. KOEHLER
CROSS CHK'D BY: B. HASKELL
APPROVED BY: C. KOEHLER
DATE: AUGUST 2009

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting • engineering • construction • operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH

FLINT ROAD LANDFILL CLOSURE PROJECT

MISCELLANEOUS DETAILS I

PROJECT NO. 75398-72037
FILE NAME: CSTDT001
SHEET NO.
D-1

FOR PERMITTING ONLY - NOT FOR CONSTRUCTION

Attachment A

June 2006 MassDEP Approval of Corrective Action Design

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

MITT ROMNEY
Governor

KERRY HEALEY
Lieutenant Governor

STEPHEN R. PRITCHARD
Secretary

ROBERT W. GOLLEDGE, Jr.
Commissioner

Nelson Burlingame, Chair
Town of Charlton, Board of Health
Main Street
Charlton, MA 01507

Re: Charlton – SWM
Charlton Landfill 90 Flint Road
Corrective Action Design Application
Transmittal # W073623
Issuance of Final Corrective Action Design Permit and Approval

Dear Mr. Burlingame:

The Department of Environmental Protection ("MassDEP") issued the referenced permit and approval as a Provisional Permit on May 17, 2006 in accordance with the provisions of Massachusetts General Laws Chapter 111, Section 150A and MassDEP's Solid Waste Management Regulations 310 CMR 19.000. MassDEP did not receive any comments related to the subject permit during the open public comment period.

As a result MassDEP **Hereby Issues** the attached as a Final Corrective Action Design Approval and Permit # W073623 for contruction activities required to close and cap the Town of Charlton's inactive Landfill located off 90 Flint Road in Charlton, MA.

If you have any further questions or comments regarding this matter, please contact Wallace Hack of my staff at (508) 767-2764.

Very truly yours,

Date: 6/20/06

John Regan
Section Chief
Solid Waste Management Program

JR/weh
Enclosure: Final Permit # W073623
W:\SWM\Towns\Charlton\Landfill\Charlton LF SW 25 Final Permit cvr.ltr

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

:TT ROMNEY
'vernor

ERRY HEALEY
eutenant Governor

STEPHEN R. PRITCHARD
Secretary

ROBERT W. GOLLEDGE, Jr.
Commissioner

BWP SW 25 - CORRECTIVE ACTION DESIGN
Charlton Landfill Closure

Final Permit Issuance Date: June 16, 2006

Name of Permittee:	The Town of Charlton Board of Health
Mailing Address:	Town of Charlton Board of Health Main Street Charlton, MA 01507
Name of Facility:	Charlton Inactive Sanitary Landfill (the "Landfill")
Facility Address:	90 Flint Road Charlton, MA 01507
DEP Region:	Department of Environmental Protection ("Department" or "MassDEP") Central Regional Office (CERO), Worcester Solid Waste Management Program
DEP Transmittal No:	W073623

I. FACILITY DESCRIPTION AND OUTSTANDING APPROVAL STATUS

A. Facility

1.	**Owner:**	The Town of Charlton
2.	**Lessor:**	None
3.	**Operator:**	BATG Environmental, Inc.

4. **Description**: The Town of Charlton's (the "Town") inactive sanitary landfill (the "Landfill") is located off 90 Flint Road in Charlton, Massachusetts. The Landfill was used as a municipal solid waste landfill by the Town from 1978 to February 1992 and covers approximately 9.5 acres.

5. **Type(s) of Waste Accepted**: The Landfill accepted municipal solid wastes from 1978 to early 1992.

6. **Methods of Management**: Landfilling

B. Reviews and Approvals

1. **MEPA**: ENF: Not Applicable
EIR: Not Applicable

2. **Site Suitability Report**: Not Applicable

3. **Site Assignment**: Not Applicable

4. **Title/Description of Current Approvals/Permits**:

a. Initial Site Assessment (ISA) and Comprehensive Site Assessment (CSA) Scope of Work Charlton Municipal Sanitary Landfill
Dated December 23, 1992
Approved by DEP-CERO: June 6, 1994

b. Comprehensive Site Assessment (CSA) Charlton Municipal Sanitary Landfill
Dated March 6, 1996
Supplemental information submitted by Cox Environmental Engineering Inc. August 31, 2004
Additional supplemental information submitted by ENSR Corporation September 29, 2004
Approved by DEP-CERO: January 28, 2005

C. Permit Application Information for BWP SW 25 - Corrective Action Design

1. **Applicant Name**: The Town of Charlton Board of Health,

Nelson Burlingame, Chair

2. **Transmittal Number**: W073623

3. **Start Date of Application**: January 25, 2005

4. **Date of Fee Receipt**: Exempt

5. **Consulting Registered Professional Engineer**:

Tata & Howard, Inc. (under seal of Donald J. Tata, P.E.)
125 Turnpike Road
Westborough, MA 01581
Tel - (508) 366-5760
Contact: Ronald Pong

6. **Title of Plans & Reports Submitted and Date of Receipt at DEP, CERO**:

a. Project Manual for the Construction of Charlton Flint Road Landfill
Final Closure Contract 1 includes specifications and
Quality Assurance/Quality Control Plan for Cap Liner Installation.
Dated: January 26 2006
Received by DEP-CERO: January 27, 2006

b. Town of Charlton Flint Road Landfill
Final Closure Grading Plan
Sheet C-1 sealed January 26, 2006

c. Town of Charlton Flint Road Landfill
Final Closure Sections and Details
Sheet D-1 sealed January 26, 2006

d. Supplemental Submittal
Tata & Howard, Inc cover letter dated April 3, 2006
(1) Sheet C-1-S CAD Supplemental Submittal Plan View
(2) Sheet D-2-S CAD Supplemental Submittal Sections A, B and C

II CORRECTIVE ACTION DESIGN APPLICATION REVIEW AND APPROVAL

A. The application for this Corrective Action Design complies with the requirements set forth in 310 CMR 19.037, "Review Procedure for Permit Modifications, Permit Renewals and Other Approvals" and 310 CMR 19.038, "Applicability and Review Criteria for a Permit or Permit Modification". This permit meets the criteria set forth in MassDEP's *Revised Guidelines for Determining Closure Activities at Inactive Landfill Sites* dated July 6, 2001 and MassDEP's *Landfill Technical Guidance Manual* dated May 1997. The

permittee's request for an approval of a Corrective Action Design is approved based on the submission of the information detailed in Section I C 6, above.

B. This document is a Permit, issued pursuant to M.G.L. c. 111, Section 150A, and 310 CMR 19.000 et seq., the "Solid Waste Management Facility Regulations" (Facility Regulations), and it is subject to the conditions set forth below. In the event this Permit conflicts with all or parts of prior plan approvals or permits issued pursuant to M.G.L. c. 111, Section 150A or solid waste regulations in effect prior to July 1, 1990, the terms and conditions of this Permit shall supersede the conflicting provisions of the prior permits and/or approvals. This Permit does not convey property rights of any sort or any exclusive privilege.

C. In addition, in the event that the requirements of this Permit conflict with all or part of any other local, state, or federal permit, the more restrictive of the conflicting provisions shall prevail and be considered to be in full effect.

D. The Quality Assurance/Quality Control Plan specified in the referenced Project Manual for the Construction of Charlton Flint Road Landfill dated January 26 2006 for the installation of a flexible membrane liner as the impermeable layer of the Landfill cap is Hereby Approved.

E. The Town must cap the landfill according to the approved cap design submitted as follows:

(1) Approximately 115,000 cubic yards of shaping and grading materials, subject to the limitations provided in Section IV. G.1. and the provisions of the approved plans and specifications referenced in Section I.C.6. a-c., shall be imported to the site and spread over the surface of the Landfill as provided in the approved plans and specifications prior to construction of subsequent layers of the final cap of the Landfill. Those materials shall conform to the specifications requirements provided in MassDEP's policies COMM-97-001 and Final Policy # BWP 94-092 and other Department policies that govern the use of alternate or beneficial use materials.

(2) Subsequent to completion of the final shaping and grading of the Landfill, a multi-layer cap on the Landfill shall be constructed comprised of the following;

a. a six (6) inch thick gas venting layer;
b. a 40-millimeters (mm) thick textured HDPE flexible membrane liner ("FML");

c. a six (6) inch thick drainage layer over the FML; and
d. a twelve (12) inch thick vegetative support layer that may be comprised of MassDEP approved bio-soils.

III. GENERAL PERMIT CONDITIONS

A. **Amount of Waste** - Not Applicable

B. **Compliance with Plans** - The Permittee shall ensure that the Landfill's final capping and closure operations are conducted in accordance with approved plans, and other submissions described in Section I.C.6., except as may be modified by the conditions set forth in Section IV. No material changes in the design or activities described in the approved documents or in this Permit shall be performed without prior written Department approval.

C. **Compliance with Other Approvals** – The Town shall ensure that the final capping and closure operations of the Landfill shall be performed by the Operator in compliance with all other applicable local, state and federal laws and regulations.

D. **Standard Conditions** - The Town shall ensure that all operations associated with the final capping and closure of the Landfill shall be conducted in full compliance with the provisions of 310 CMR 19.007-19.011 and 19.043(5).

E. **Joint Liability** - In accordance with 310 CMR 19.043(3), this Permit is issued on the condition that the permittee shall be liable jointly and severally with the owner or operator for any civil or administrative penalties assessed or orders entered by MassDEP arising from any improper facility operation, maintenance, closure, post-closure or other activities performed in violation of MassDEP's regulations and applicable statutes.

F. **Transfer** - No transfer of this Permit shall be permitted except in accordance with the requirements of 310 CMR 19.044.

G. **Permit Modification** - MassDEP reserves the right to rescind, suspend or modify this Permit pursuant to 310 CMR 19.040 by the imposition of additional conditions based upon a determination of actual, or the threat of, adverse impacts from the construction, operation, maintenance or closure of the facility.

H. **Deed Notice** - Pursuant to 310 CMR 19.141 the permittee shall record a notice that a landfill has been operated on the site at the appropriate Registry of Deeds

or, if the site is registered land, in the registry section of the land court for the district wherein the land lies.

IV. SPECIFIC PERMIT CONDITIONS

A. **Construction Certification** – Within sixty (60) days from the date of completion of all construction activities associated with the final capping and closure of the Landfill but not later than thirty (30) calendar months from the effective date of this approval, the Town of Charlton shall submit to MassDEP's Central Regional Office, a copy of an engineer's report (the "Certification Report") certifying that all construction and quality control/quality assurance activities relating to closure of the Landfill have been conducted in accordance with the approved plans and specifications and any approved changes to those plans and specifications that may be approved by MassDEP, this permit and the solid waste regulations. That construction certification shall be completed in accordance with the requirements set forth in 310 CMR 19.107 : Construction Certification.

B. **Verification of Materials and In-Place Thickness** – The Town shall ensure that tests, necessary to verify the relative elevations, minimum/maximum permeability/hydraulic conductivity and average thickness of each layer of the capping materials shall be conducted under the direct supervision of a Massachusetts Registered Professional engineer. The Town shall also ensure that the results of those tests are included in the Certification Report.

C. **Post Closure Landfill Monitoring** - The Town shall conduct post-closure ground water, surface water and landfill gas monitoring in accordance with the sampling plan and schedule described in a report titled "Supplemental Information Submittal" dated September 29, 2004 by ENSR Corporation as referenced in Section I.B.4.b. of this Permit and the provisions of 310 CMR 19.132 (1) and (4), Environmental Monitoring Requirements.

The Town shall ensure that analytical results, exceptions reports and summary results of all ground water, surface water and landfill gas monitoring events are submitted to MassDEP's Central Regional Office, Solid Waste Management Program within sixty (60) days of sample collection in accordance with the provisions of 310 CMR 19.132(1)(f) and 310 CMR 19.132(4)(d).

D. **Stormwater Management** – The Permittee shall implement and maintain appropriate erosion and sedimentation control measures to adequately handle stormwater runoff and protect surface water, if any, adjacent to the Landfill. The permittee shall ensure that the Operator has a stormwater protection plan in place prior to commencement of site activities.

E. **Wetlands Protection** -The local Conservation Commission shall have made applicable determinations as to whether the proposed corrective actions at the

Landfill are subject to the jurisdiction of the Wetlands Protection Act (MGL, Chapter 131, Section 40) and, if required, a Final Order of Conditions related to the corrective action shall have been issued prior to the start of applicable closure construction activities.

F. **Financial Assurance Mechanism** – The Town shall submit to MassDEP, for its review and approval, documents constituting or evidencing establishment of an acceptable Financial Assurance Mechanism (FAM) in accordance with the provisions of 310 CMR 19.051, *Financial Assurance Requirements*, prior to the commencement of closure activities at the Landfill.

The FAM shall provide the availability of sufficient monies to ensure complete closure of the Landfill in compliance with the technical requirements of MassDEP's applicable regulations, guidance documents and permit approvals and within the timelines established by this Consent Order or any subsequent amendments thereto. The FAM shall be structured so that MassDEP shall be a party to said mechanism to the extent that it shall have the right to obtain, without the consent of the Town or the Operator, exclusive direction and control over the transfer, use and disbursement of the secured funds or performance benefits to perform approved closure and post-closure maintenance or secure reimbursement for costs incurred for so performing upon its determination that the Town or Operator has failed in whole or in part to carry out closure or post-closure requirements in accordance with 310 CMR 19.000 or any plan or permit conditions or orders issued thereunder.

G. **Final Cover Design Standards -**

1. Shaping and grading materials

(a) Approximately 115,000 cubic yards of shaping and grading materials, subject to the limitations provided below in this paragraph may be imported to the Landfill and spread over the surface of the Landfill as provided in the approved plans and specifications prior to construction of subsequent layers of the final cap of the Landfill. The approximate 12,000 cubic yards of material deposited at the site by the operator prior to December 2005 is to be counted towards the total tonnage. At a minimum all shaping and grading materials shall conform to the specifications requirements provided in MassDEP's policies COMM-97-001 and Final Policy # BWP 94-092 over the course of the project.

(b) The shaping and grading materials imported to the Landfill shall be limited to:

i. Uncontaminated soils;

ii. Soils that conform to the specifications provided in MassDEP Policy COMM-97-001 (COMM-97 soils);

iii. Street Sweepings that conform to the specifications, definitions and restrictions provided in MassDEP's Policy BWP 94-092, and

iv. Dewatered catch basin cleanings from separate storm sewers only (not from combined sanitary and storm sewers).

(c) Stockpiling of shaping and grading materials shall not be allowed on the site of the Landfill. All shaping and grading materials imported to the site shall be placed in its final position within 72 hours of delivery to the site.

(d) Residuals and fines generated by construction and demolition processing facilities are prohibited from use as shaping and grading materials.

(e) All shaping and grading materials that were placed on the Landfill by the Operator during the fall of 2005 and as depicted in the supplemental submittal information referenced in paragraph I.C.6.d. of this Permit shall be mixed with uncontaminated soils or soils that met the specifications of MassDEP's policy COMM-97 at a minimum ratio of one part C&D fines to one part soils and re-compacted prior to the commencement of any another construction activity at the Landfill.

2. Gas-Venting Layer

A six (6) inch thick gas-venting layer with a minimum permeability of 1×10^{-3} cm/sec shall be constructed on top of the shaping and grading materials in accordance with the plans and specifications and other submissions described in Section I.C.6.

3. Impervious Layer

An impervious flexible membrane liner ("FML") consisting of a minimum thickness of 40 millimeters (mm) textured High Density Polyethylene (HDPE) shall be installed on top of the gas venting layer in accordance with the plans and specifications and approved Quality Assurance/Quality Control Plan described in Section I.C.6.

4. Drainage Layer

A six (6) inch thick drainage layer with a minimum hydraulic conductivity of 1 x 10^{-3} cm/sec shall be installed on top of the FML in accordance with the plans and specifications and other submissions described in Section I.C.6.

5. Vegetative Support Layer

A twelve (12) inch thick clean soil layer complete with vegetative seeding capable of supporting grassy vegetative growth shall be installed on top of the drainage layer in accordance with the plans and specifications and other submissions described in Section I.C.6.

(a) Only short paper fiber ("SPF") or compost bio-manufactured soils ("bio-soils") approved by MassDEP in a source-specific Beneficial Use Determination(s) pursuant to 310 CMR 19.060: Beneficial Use of Solid Waste for use as an alternative material in a vegetative layer in landfill closures shall be used at the Town's Landfill. Complete records of the quantities and sources of all SPF or bio-soils used at the Landfill for the vegetative layer must be must be provided to the engineer.

(b) The use of SPF or bio-soils as part of the vegetative support layer shall be subject to approval by the engineer.

(c) All materials containing in whole or part any SPF or bio-soils intended to be used at the Landfill shall be mixed at the site of application with a minimum ratio of one part SPF or bio-soils with one part uncontaminated soils prior to placement on top of the drainage layer of the Landfill.

H. Stormwater Drainage

The Town shall ensure that the Operator installs a stormwater detention basin and all stormwater drainage swales in accordance with the plans and specifications and other submissions described in Section I.C.6.

I. Groundwater Monitoring Wells

Subsequent to the completion of the construction of the Landfill Cap and Stormwater drainage appurtenances of the Landfill, the Town shall ensure that the Operator ensures that all groundwater monitoring wells that were previously installed prior to commencement of the construction activity associated with this Permit are accessible and undamaged and are functioning as designed.

In the event that well(s) are damaged, the Town shall ensure that the Operator repairs or replaces the well(s) as necessary and as approved by the engineer.

J. Relocation of Solid Waste

(1) the Town shall ensure that the Operator relocates refuse located within the existing entrance/access road along the eastern approach of the Landfill to the northerly perimeter of the Landfill as depicted on the referenced plans and as directed by the engineer and in accordance with the plans and specifications and other submissions described in Section I.C.6.

(2) All refuse relocation activity shall be conducted in as expeditious manner as possible minimizing the time involved and the exposure of refuse to the environment.

(3) In the event that the refuse re-location may take more than one working day, the remaining exposed refuse at the easterly entrance to the Landfill and the exposed relocated refuse at the northerly perimeter of the Landfill shall be covered with a minimum of six (6) inches of soil at the end of each working day necessary to complete the refuse relocation activity.

(4) All tires, white goods, tree stumps, CRT's, lead acid batteries and other metals uncovered during the refuse relocation operations shall be segregated and disposed of off-site at appropriate facilities in accordance with the requirements set forth at 310 CMR 19.000.

K. Rubber Tire Chips

The use of rubber shredded rubber tires in the construction of the drainage layer or any storm water run-off swales and erosion controls is expressly prohibited.

V. RIGHT OF APPEAL

A. Review of Decision

MassDEP has deferred the effective date of this provisional permit for the purpose of obtaining and reviewing comments prior to a final decision. The effective date is deferred for thirty (30) days from the date of issuance to accommodate a public comment period and time for MassDEP to review any comments received. A twenty-one (21) day comment period shall begin on May 17, 2006 and end on June 7, 2006. At the close of the public comment period, MassDEP will review the comments received and will rescind or modify the provisional permit in writing, if necessary. If no modification is necessary, than the effective date of the final permit shall be June 16, 2006 and the permit shall become a final permit on that date.

Pursuant to 310 CMR 19.037(4)(b), if the applicant (Permittee) is aggrieved by the Department's decision to issue this permit, it may within twenty-one (21) days

of the date of issuance file a written request that the decision be deemed a provisional decision, and a written statement of the basis on which the applicant believes it is aggrieved, together with any supporting materials. Upon timely filing of such a request, the decision shall be deemed a provisional decision with an effective date twenty-one (21) days after MassDEP's receipt of the request. Such a request shall reopen the administrative record, and MassDEP may rescind, supplement, modify, or reaffirm its decision. If MassDEP reaffirms its decision, the decision shall become a final permit on the effective date. Failure by an applicant to exercise the right provided in 310 CMR 19.037(4)(b) shall constitute a waiver of the applicant's right to appeal.

B. Right to Appeal

Any person aggrieved by the issuance or denial of this permit, except as provided for under 310 CMR 19.037(4)(b), may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, § 150A and M.G.L. c. 30A not later than thirty (30) days following the date upon which this permit becomes a final permit. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the permit by a court of competent jurisdiction, this permit shall remain effective at the conclusion of the 30 day period.

C. Notice of Appeal

Any aggrieved person intending to appeal the issuance of this permit to the Superior Court shall first provide notice of intention to commence such action. Said notice of intention shall include the file number (Transmittal No. W 073623) and shall identify with particularity the issues and reason why it is believed the permit decision was not proper. Such notice shall be provided to the Office of General Counsel of MassDEP and the Regional Director for the regional office which processed the permit application at least five (5) days prior to the filing of an appeal.

John J. Regan
Section Chief
Solid Waste Management Program

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

Town of Charlton
37 Main Street
Charlton, MA 01507
Attention: Robin L. Craver, Town Administrator

Re: BWP – Charlton, UAO-CE-09-4005
Violations of M.G.L. c. 111 §§ 150A and 150A1/2, 310 CMR 10.00, 310 CMR 16.00, and 310 CMR 19.000

THE ATTACHED DOCUMENT IS IMPORTANT. FAILURE TO TAKE ADEQUATE ACTION IN RESPONSE TO IT COULD RESULT IN SERIOUS LEGAL CONSEQUENCES.

Dear Ms. Craver:

Attached is an ADMINSTRATIVE ORDER MassDEP is now issuing to the Town of Charlton (the "Town").

The Order contains a written description of (1) activities brought to the attention of MassDEP; (2) the statutory requirements violated; (3) the actions MassDEP now wants the Town to take to correct the violations; and (4) the deadlines for taking suction actions.

If the Town fails to take any action MassDEP now wants taken by the prescribed deadline, or if the Town otherwise fails to comply in the future with the requirements applicable to the Town, the Town could be subject to legal action. Such action could include referral to the Attorney General for criminal prosecution, court-imposed civil penalties, or civil administrative penalty, which may be assessed for every day from now on that the Town is in noncompliance with the requirements referred to above. Notwithstanding this Order, MassDEP reserves the right to exercise the full extent of its legal authority in order to obtain full compliance with all applicable requirements, including but not limited to civil action including court imposed civil penalties, or administrative penalties assessed by MassDEP.

Very truly yours,

Date: 8/27/09

for Martin Suuberg
Regional Director
Central Regional Office

cc: Charlton BOH
OE, Boston

W:\SWM\Towns\CHARLTON\Landfill (BATG)\Charlton UAO cvr ltr Aug 09.doc

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of: **Town of Charlton**	File No. UAO-CE-09-4005 **UNILATERAL ADMINISTRATIVE ORDER**

I. THE PARTIES

1. The Department of Environmental Protection ("Department" or "MassDEP") is a duly constituted agency of the Commonwealth of Massachusetts established pursuant to G.L. c. 21A, §7. MassDEP maintains its principal office at One Winter Street, Boston, Massachusetts 02108, and its Central Regional Office at 627 Main Street, Worcester, Massachusetts 01608.

2. The Town of Charlton (the "Town") is a duly organized municipality established pursuant to the laws of the Commonwealth of Massachusetts, having a mailing address at 37 Main Street, Charlton, Massachusetts 01507.

II. PRELIMINARY STATEMENT

3. This Order is issued pursuant to the authority vested in MassDEP by M.G.L. c. 111, §2C; M.G.L. c. 131, §40 and Wetlands Protection Regulations at 310 CMR 10.00; and M.G.L. c. 111, §§150A and 150A 1/2 and the Solid Waste Management Regulations at 310 CMR 19.000 and the Site Assignment Regulations for Solid Waste Facilities at 310 CMR 16.00. This Order requires the Town to take actions described herein to abate a potential threat to human health and

the environment posed by the incomplete closure activities at an inactive landfill in Charlton, Massachusetts, and to ensure the safe and complete capping and closure of the landfill. The actions required by this Order are intended to result in the safe capping of the landfill, to prevent the discharge of pollutants to air, water, and other natural resources of the Commonwealth, and to prevent the creation of a public nuisance.

III. STATEMENT OF FACTS AND LAW

4. The Department is responsible for the implementation and enforcement of M.G.L. c. 111, §§ 150A and 150A1/2, the Solid Waste Management Regulations at 310 CMR 19.000, and the Site Assignment Regulations at 310 CMR 16.00. The Department has authority under M.G.L. c. 111, § 2C to issue orders to any person in violation of any law or regulation the Department is authorized to enforce. In addition, the Department has the authority under M.G.L. c. 111, § 150A to issue orders to enforce the provisions of M.G.L. c. 111, § 150A, 310 CMR 19.000, and 310 CMR 16.00.

5. The Town owns an inactive, unlined, and uncapped municipal solid waste landfill (the "Landfill") located off Flint Road in Charlton, Massachusetts (the "Site"). The Town used the Landfill, which covers approximately 9.5 acres, to dispose of municipal solid waste from 1978 until February 1992. The Landfill is subject to the landfill closure and post-closure requirements set forth in the Department's solid waste regulations at 310 CMR 19.000 and the Department's Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites dated July 6, 2001 (the "Revised Guidelines").

6. In December 2004, the Town submitted an application to the Department for a Corrective Action Design permit (the "CAD Permit") to close the Landfill in accordance with the solid waste regulations and the Revised Guidelines. At about the same time, on December 15, 2004, the Town entered into a contract with BATG Environmental, Inc. ("BATG") to oversee all construction activities associated with the final closure and capping of the Landfill.

7. Because of technical deficiencies in the CAD permit application, the Town was given until October 28, 2005 to submit additional information to the Department to support the permit application. By letter dated October 28, 2005, the Town authorized BATG to implement corrective actions at the Landfill, even though the CAD Permit application was still pending.

8. On November 16, 2005, upon discovering that BATG was hauling truckloads of solid waste and soils to the Site and depositing them on top of the Landfill, MassDEP issued a Unilateral Administrative Order (UAO-CE-05-4001) requiring BATG to cease and desist from undertaking any corrective action at the Landfill until the Department issued the CAD Permit to authorize the work. The solid waste and soils brought to the Landfill were not of the type approved in the Revised Guidelines for use in closure activities, and included processed construction/demolition fine materials ("C&D fines").

9. On March 20, 2006, the Town and the Department entered into an Administrative Consent Order and Notice of Noncompliance that required the Town to submit a revised CAD Permit application, to establish a financial assurance mechanism ("FAM") to fund the complete

closure of the Landfill, and to complete the corrective actions approved by the Department by December 31, 2007.

10. On June 15, 2006, the Town executed a Contract Change Order with BATG, providing that BATG would fund the FAM for the Town. The Town elected to establish an Enterprise Fund as its FAM, pursuant to the Solid Waste Management Regulations at 310 CMR 19.051(12)(b).

11. On June 16, 2006, the Department issued the CAD Permit that authorized the Town, and BATG as the operator, to import 115,000 cubic yards of shaping and grading materials to the Site to close the Landfill. The CAD Permit established the design requirements for construction of gas venting, drainage, and vegetative support layers on the Landfill; established a deadline of 30 months to complete closure activities; and required the Town to establish the FAM before beginning construction activities. The CAD Permit allowed the Town to use the 12,000 cubic yards of unauthorized material that BATG had already brought to the Site, but only if the C&D fines were mixed with other materials before being used on the Landfill. The CAD Permit also prohibits the stockpiling of shaping and grading materials at the Site.

12. On January 29, 2007, MassDEP and BATG entered into an Administrative Consent Order with Penalty and Notice of Noncompliance (ACOP-CE-06-9035-46A) (the "2007 ACOP") to resolve the enforcement action against BATG for violations of solid waste, wetlands and industrial wastewater regulations at the Landfill observed by MassDEP on November 16, 2005. The 2007 ACOP required BATG to pay a penalty of $33,620.00, of which $17,000.00 was

suspended, and to mix the C&D fines with appropriate materials before using them for closure activities. In paragraph 18.C of the 2007 ACOP, BATG agreed to comply with the CAD Permit during all construction activities at the Landfill.

13. In August 2007, BATG again brought unauthorized materials to the Landfill to be used as shaping and grading material. MassDEP issued another Unilateral Administrative Order to BATG on September 7, 2007(UAO-CE-07-4001) for BATG's use of materials not authorized in the CAD Permit, and for stockpiling the materials at the Site in violation of the CAD Permit. The Department directed BATG to remove all of the unauthorized material from the Site and to provide proof of its legal disposal or reuse.

14. On January 18, 2008, the Department issued a third Unilateral Administrative Order to BATG (UAO-CE-08-6W001) for violations of the Wetlands Protection Act, G.L. c. 131, §40 and its implementing regulations at 310 CMR 10.00. Specifically, during an inspection on January 11, 2008, the Department observed the discharge of silt-laden runoff from unstable soils from the landfill capping activities that altered approximately ½ acre of bordering vegetated wetlands and two intermittent streams. The Department directed BATG to cease the discharge of silt-laden runoff and to implement erosion controls at the Site.

15. On March 31, 2008, the Department issued a fourth Unilateral Administrative Order (UAO-CE-08-4004) to BATG for its failure to provide the certification required under the CAD Permit that the shaping and grading materials had been placed at the Landfill in accordance with the requirements of the CAD Permit, and for failing to fully fund the FAM, as required in

paragraph 18.B of the 2007 ACOP. The Department directed BATG to cease accepting soils for shaping and grading at the Landfill; to provide certain analyses of the soils used for the gas venting layer; to complete the shaping and grading and provide the required certification to the Department; and to complete funding of the FAM. The Department also established new deadlines for the remaining construction activities related to the closure, superseding the deadlines in the 2007 ACOP.

16. On June 24, 2008, the Department issued a fifth Unilateral Administrative Order to BATG (UAO-CE-08-4009), which superseded the deadlines established in the prior Order, UAO-CE-08-4004.

17. On November 25, 2008, the Department and BATG entered into another Administrative Consent Order With Penalty and Notice of Noncompliance (ACOP-CE-08-6W005) (the "2008 ACOP"), addressing the violations of the Wetlands Protection Act described in paragraph 14 above. In the 2008 ACOP, BATG agreed to implement an Erosion Control Plan and a Wetlands Restoration Plan to correct the violations and to prevent future alterations of wetland areas. BATG also agreed to pay a $20,000.00 penalty, with an additional $5,000.00 suspended pending compliance with the 2008 ACOP.

18. On April 27, 2009, MassDEP personnel and the Charlton Board of Health Agent met at the Landfill and observed approximately fifteen piles of material stockpiled at the entrance of the Landfill. The material consisted of hard, clay-like mineral material with approximately five percent of the material consisting of construction and demolition waste. In addition, there was a

de minimus amount of solid waste mixed in. The CAD Permit prohibits stockpiling of materials at the Site.

19. On May 29, 2009, MassDEP personnel conducted a site visit at the Landfill and observed that the previous piles of material had been flattened and three new large piles of material were stockpiled at the entrance of the Landfill on top of the previously flattened material. The new material consisted primarily of the same clay-like mineral material as observed during the April 27, 2009 inspection with a small amount of humic material. Once again, MassDEP personnel observed that approximately five percent of the material consisting of construction and demolition waste along with a *de minimus* amount of solid waste mixed with the material. In addition, MassDEP observed that there had been no substantial work undertaken at the Landfill since the flexible membrane liner, ("FML"), was installed in 2008. The FML has remained exposed to the elements for several months, and is therefore at risk of damage or deterioration.

20. The Town has failed to comply with the terms and conditions of the CAD Permit, in violation of 310 CMR 19.081(1). Specifically, the Town has failed to complete the capping and closure of the Landfill within 30 months of the issuance of the CAD Permit. BATG, as the Town's contractor, has failed to comply with the extended deadlines for the closure activities contained in UAO-CE-08-4009, which required certification that all construction activity has been completed at the Landfill in accordance with the CAD Permit by October 30, 2008. The Department acknowledges that the Town's ability to complete the work required by the CAD Permit has been affected by the repeated and continued non-compliance of BATG, its contractor, as described above.

IV. DISPOSITION AND ORDER

21. For the reasons stated above, and pursuant to M.G.L. c. 111, § 2C; M.G.L. c. 111, §§ 150A and 150A 1/2; and M.G.L.c. 131, § 40, MassDEP hereby ORDERS the Town to take the following actions:

A. Within fifteen (15) days of this order submit to the Department the name of the construction company who will complete all remaining work associated with the capping and closure of the Landfill in accordance with the CAD permit and all local, state, and federal statutes and regulations. The Department anticipates that the construction of the final cap over the landfilled waste as required under the CAD permit can be completed on or before December 31, 2009.

B. Within fifteen (15) days of receipt of this Order provide to the Department confirmation that the FML has been sufficiently anchored to protect it from damage while the closure work is completed.

C. Within thirty (30) days of receipt of this Order provide to the Department confirmation that the stormwater has been re-channeled to the on-site detention basin and away from discharging to the wetlands.

D. Within seven (7) days of receipt of this Order submit an evaluation report prepared by a registered professional engineer, or other qualified professional approved by the Department regarding the feasibility of achieving an effective closure of the landfill structure. The evaluation report shall include the following:

1. Integrity of the existing FML including identification of repaired or damaged areas;

2. Condition of the existing passive gas venting system;

3. Determination of the usability of any soil stockpiled on site and, if necessary, plans to relocate excess soil;

4. Any proposed revisions to the approved CAD Permit required to address on-site conditions;

5. Adequacy of the existing stormwater retention basin and associated drainage system for the capped landfill;

6. Description of proposed steps to stabilize areas outside the extent of the existing FML such as the perimeter access road, stormwater detention basin, and the proposed wetland restoration area;

7. An updated cost estimate to complete the capping of the landfill;

8. A proposed schedule for completing the remaining construction activities related to implementing the CAD;

E. Within thirty (30) days of receipt of this Order submit adequate quality assurance/quality control information and testing data that demonstrates the flexible membrane liner component of the landfill cap installation was completed appropriately.

F. Within thirty (30) days of receipt of this Order complete a perimeter drainage/stormwater diversion system around the landfill to ensure that stormwater is contained within the landfill footprint.

G. Within ninety (90) days of receipt of this Order provide a plan for the complete cleanout and reconstruction of the on-site detention basin.

H. Within ninety (90) days of receipt of this Order stabilize the access road surrounding the landfill in order to prevent continued erosion of the road to the wetlands.

I. The Department requires an initial status report prepared by a registered professional engineer, or other qualified professional approved by the Department within seven (7) days of the receipt of this Order covering items A. thru H.

J. Thereafter the Department requires monthly status reports prepared by a registered professional engineer, or other qualified professional approved by the Department, covering outstanding items from A. through H., submitted by the 15th.

22. Pursuant to 310 CMR 19.051(9), the Town is authorized to expend funds from the Enterprise Fund FAM to complete the closure activities required in paragraph 21 above.

23. Upon receipt of this Order, the Town shall immediately notify MassDEP in writing of its intent to comply with this Order. Failure by the Town to provide such notification shall constitute a violation of this Order. Such notice shall be delivered to:

D. Lynne Welsh
Acting Solid Waste Section Chief
Department of Environmental Protection
Central Regional Office
627 Main Street
Worcester, MA 01608
Fax: (508) 792-7621

24. The Town is advised that if it fails to comply with this Order, the following statutory provision may apply. M.G.L. c. 111, § 150A provides, "Any person, including any political subdivision of the commonwealth who violates this section, or any order issued pursuant thereto, or any rule or regulation promulgated hereunder (1) shall be subject to a fine of not more than twenty-five thousand dollars, ($25,000.00) or by imprisonment for not more than two years in a house of correction, or both, for each such violation; or (2) shall be subject to a civil penalty not to exceed twenty-five thousand dollars ($25,000.00) for each such violation. Each day each such violation occurs or continues shall be deemed a separate offense. These penalties shall be in addition to any other penalties that may be prescribed by law."

25. The Town is also advised that M.G.L. c.131, §40 provides, "Whoever violates any provision of this section, (a) shall be punished by a fine of not more than twenty-five thousand dollars or by imprisonment for not more than two years, or both such fine and imprisonment; or (b), shall be subject to a civil penalty not to exceed twenty-five thousand dollars for each violation."

26. The Town is further advised that if it fails to comply with this Order, M.G.L. c. 21A, §16 provides for civil administrative penalties of up to $25,000.00 for each day after the issuance of this Order during which each violation covered by this Order continues or is repeated.

27. The Town may also be subject to administrative or civil penalties for the past violations described in the Order. Questions regarding the contents of the Order should be directed to:

D. Lynne Welsh
Acting Solid Waste Section Chief
Department of Environmental Protection
Central Regional Office
627 Main Street
Worcester, MA 01608
Fax: (508) 792-7621

V. ADJUDICATORY HEARING

28. The Town is hereby notified that it may request an adjudicatory hearing on this Order by filing a Notice of Claim for an Adjudicatory Appeal ("Notice of Claim") pursuant to M.G.L. c. 30A, § 10 and 310 C.M.R. 1.00.

A. Complete adjudicatory appeal applications require the submittal of a Notice of Claim and an Adjudicatory Hearing Fee Transmittal Form, a copy of which is attached hereto for convenience. A completed Fee Transmittal Form, including an appeal fee payment of $100.00, must be mailed to MassDEP's Lockbox at:

Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
Box 4062
Boston, MA 02211

B. The Notice of Claim (including a copy of the $100.00 appeal fee payment check and the completed Fee Transmittal Form) must be sent by United States mail or hand-delivered to MassDEP within twenty-one (21) days after the date of issuance of this Order. The Notice of Claim must be addressed to:

Case Administrator
Office of Appeals and Dispute Resolutions
Department of Environmental Protection
One Winter Street – 2nd Floor
Boston, MA 02108

The Notice of Claim shall clearly and concisely set forth the facts related to the proceeding, the reasons the Order is considered to be inconsistent with M.G.L. c. 111, §§ 150A and 150A ½; 310 CMR 16.00 and 310 CMR 19.000; and M.G.L.c. 131, § 40 and 310 CMR 10.00, and the relief sought through the adjudicatory appeal. Failure to submit all necessary information in accordance with 310 CMR 1.00 may result in a dismissal by MassDEP of the Notice of Claim for an Adjudicatory Hearing. Failure to pay the filing fee as required is grounds for dismissal of the request for hearing. Upon a showing of undue financial hardship, MassDEP may waive the adjudicatory hearing filing fee. A person who believes that payment of the $100.00 filing fee would be an undue financial hardship must file, together with the request for adjudicatory hearing as provided above, an affidavit setting forth the facts the appellant believes constitute the undue financial hardship.

C. A copy of the request should be sent to:

Mary Jude Pigsley
Chief Regional Counsel
Department of Environmental Protection
Central Regional Office
627 Main Street
Worcester, MA 01608

DEPARTMENT OF ENVIRONMENTAL PROTECTION

By: _____

for Martin Suuberg, Regional Director
Central Regional Office
627 Main Street
Worcester, Massachusetts 01608
Telephone (508) 792-7650

Date: 8/27/09

Massachusetts Department of Environmental Protection

Adjudicatory Hearing Fee Transmittal Form

IMPORTANT! This form is intended for fee transmittal only. The contents of a request for an adjudicatory appeal (Notice of Claim) are established at 310 CMR 1.01(6) and the substantive statutes and regulations governing the Department's action.

A. Person/Party Making Request

1. Name and address of person or party making request:

Name - If appropriate, name group representative

Street Address

City | State | Zip Code

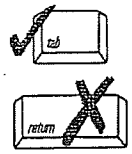
2. Project Information:

Street Address

City | State | Zip Code

DEP File or ID Number | $ Amount of filing fee attached

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



B. Applicant (if applicable)

1. Name and address of applicant:

Name - If appropriate, name group representative

Street Address

City | State | Zip Code

C. Instructions

1. Send this form and check or money order to $100.00 payable to the Commonwealth of Massachusetts to the MassDEP Lockbox at:

   Department of Environmental Protection
   P.O. Box 4062
   Boston, MA 02211

2. Send a **copy** of this form and a **copy** of the check or money order with the Request for Adjudicatory Appeal (Notice of Claim) to:

   Case Administrator
   Office of Appeals and Dispute Resolution
   One Winter Street
   Boston, MA 02108

Attachment B

Photographs from June 26, 2009 Site Visit

Photo 1: Stockpile of soils in northwest corner of landfill, north of northern site entrance.

Photo 2: Northeastern slope.

Photo 3: Eastern slope. Note: Photos 1-3 taken from the same location.

Photo 4: Facing south, roadway between landfill and Flint Road. BATG site trailer on left.

Photo 5: Eroded soil piles on south side of southern entrance roadway (facing west).

Photo 6: Material storage area, facing northwest. Stockpiles of soils were delivered June 2009.

Photo 7: Water tanks located in material storage area.

Photo 8: Standing water and siltation on southern side of south site entrance.

Photo 9: Sediment observed at culvert outlet located on Flint Road, south of southern entrance road to landfill site. Cause of sediment unknown, may be from roadway runoff or landfill.

Photo 10: Sediment observed between southern landfill entrance and culvert.

Photo 11: Stockpile of sand near site entrance, approximately 10 cy.

Photo 12: Material staging area.

Photo 13: Battery left unprotected in materials storage area.

Photo 14: East slope of landfill. Muddy tire tracks observed on liner.

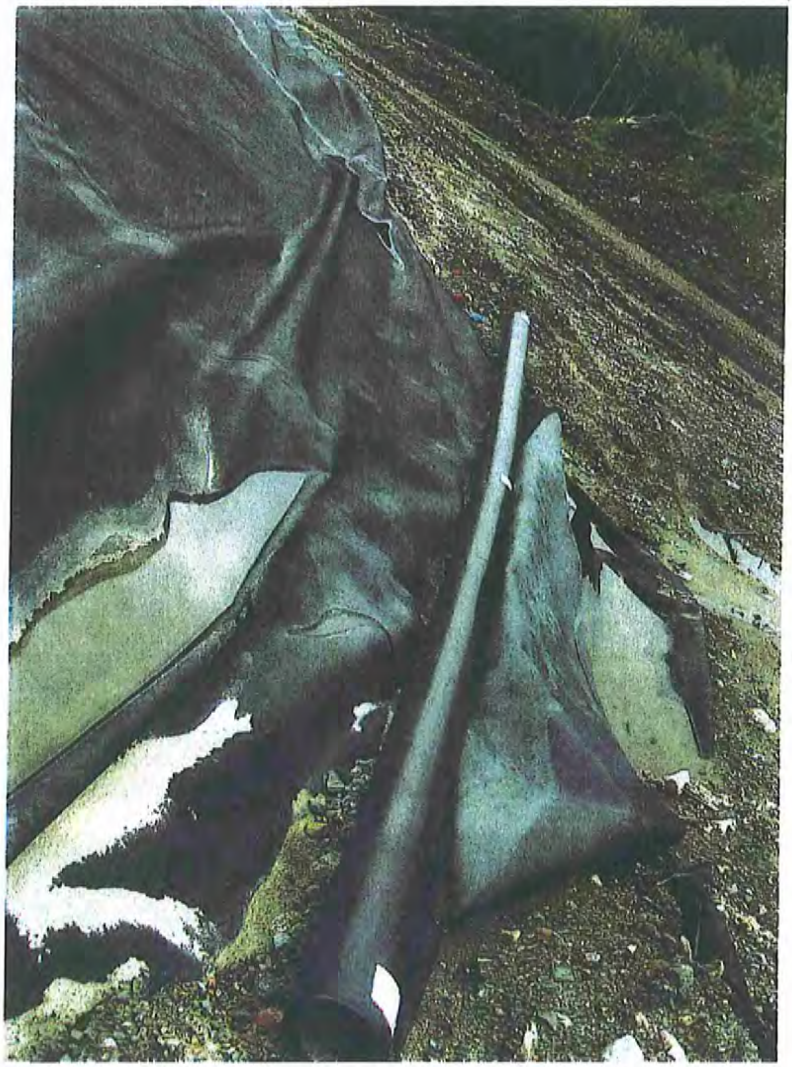
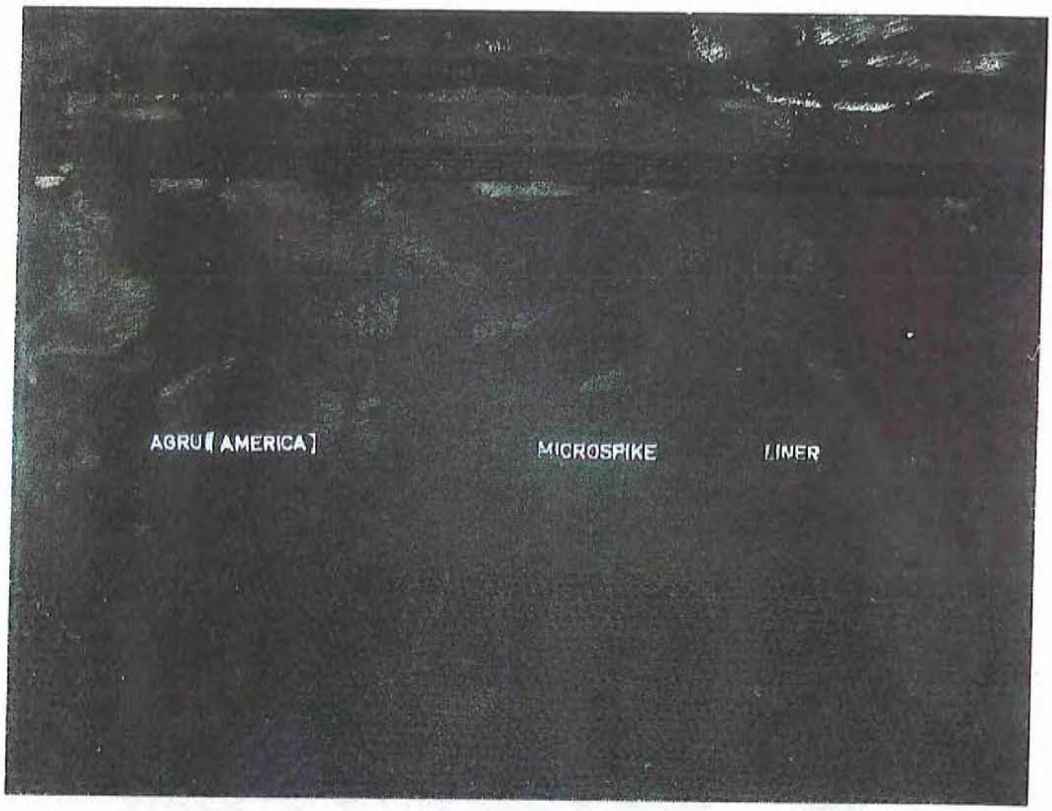
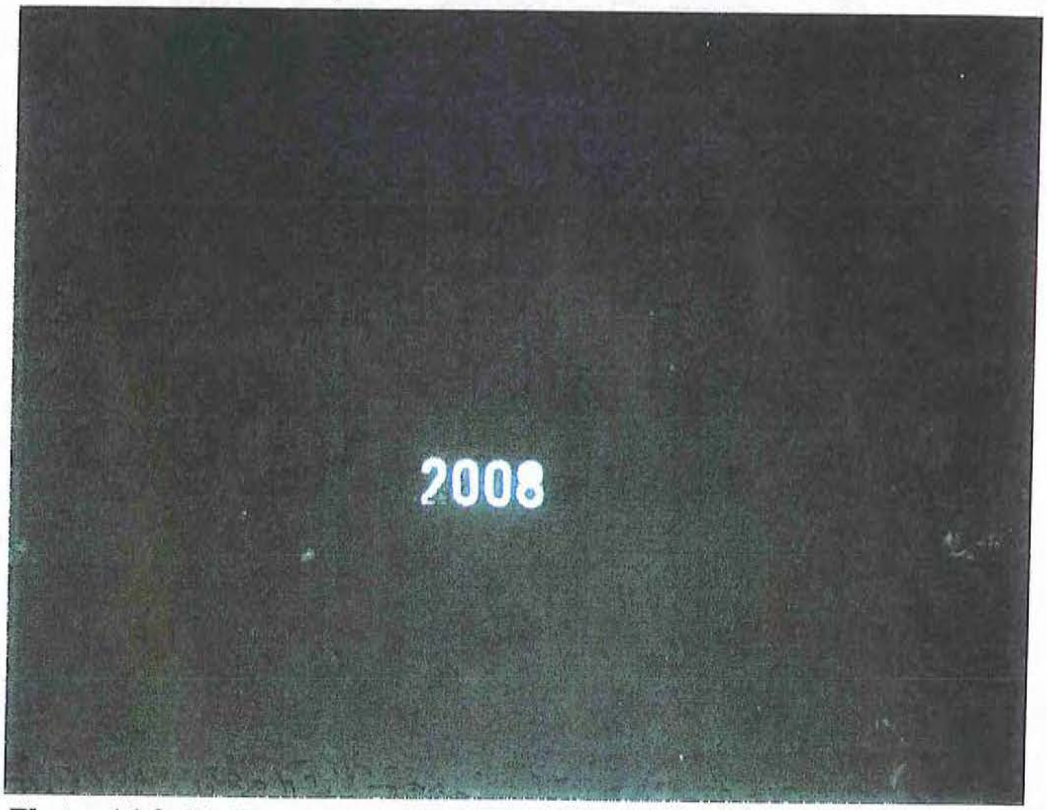


Photo 15: Edge of HDPE Geomembrane, no visible anchor trench.





Photos 16 & 17: HDPE geomembrane

Photo 18: Torn HDPE geomembrane at landfill gas vent.

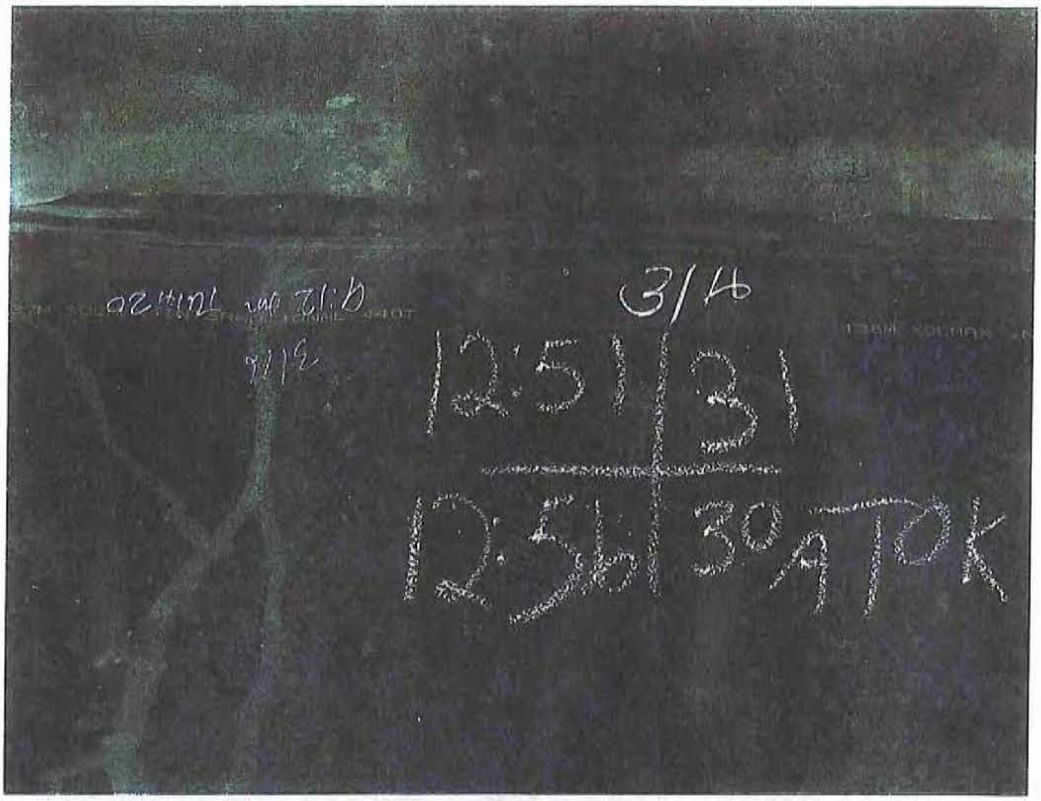


Photo 19: Non-destructive air-testing information on HDPE geomembrane.

Photo 20: Second type of textured geomembrane used on site.

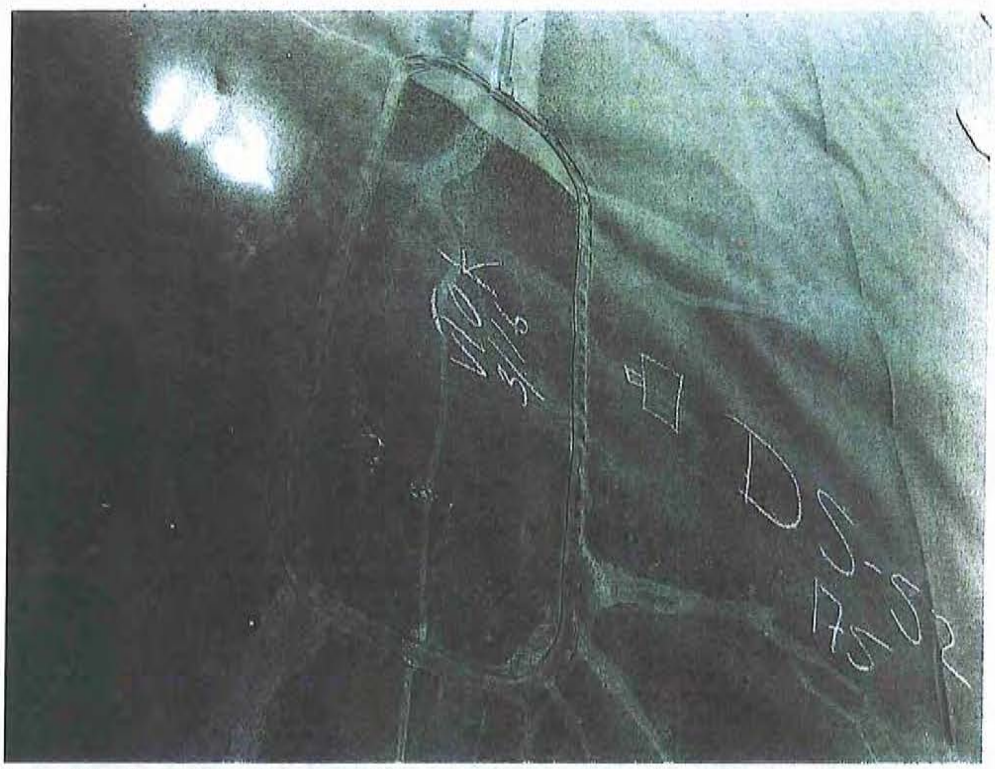


Photo 21: Location of destructive sample number 52, patched and vacuum tested.

Photo 22: Plateau, facing north-northwest; pile of soil on top of plateau, remnants of liner rolls remain.

Photo 23: Plateau, facing west; settlement of plateau area was observed.

Photo 24: HDPE geomembrane roll label from roll cores on plateau.

Photo 25: Area of settlement on plateau area. Visible puddles.

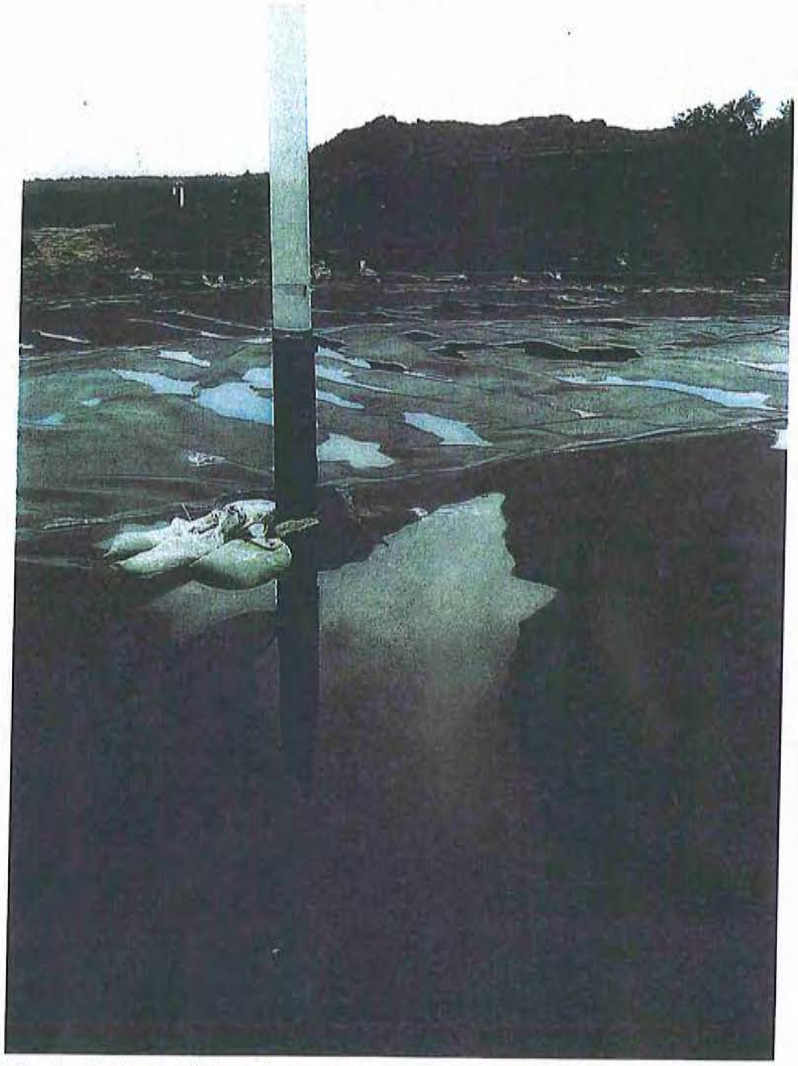


Photo 26: Additional puddles in area of settlement or FML rippling on plateau.

Photo 27: Plateau, facing southwest; jersey barriers along top of slope.

Photo 28: Jersey barriers placed directly on liner.

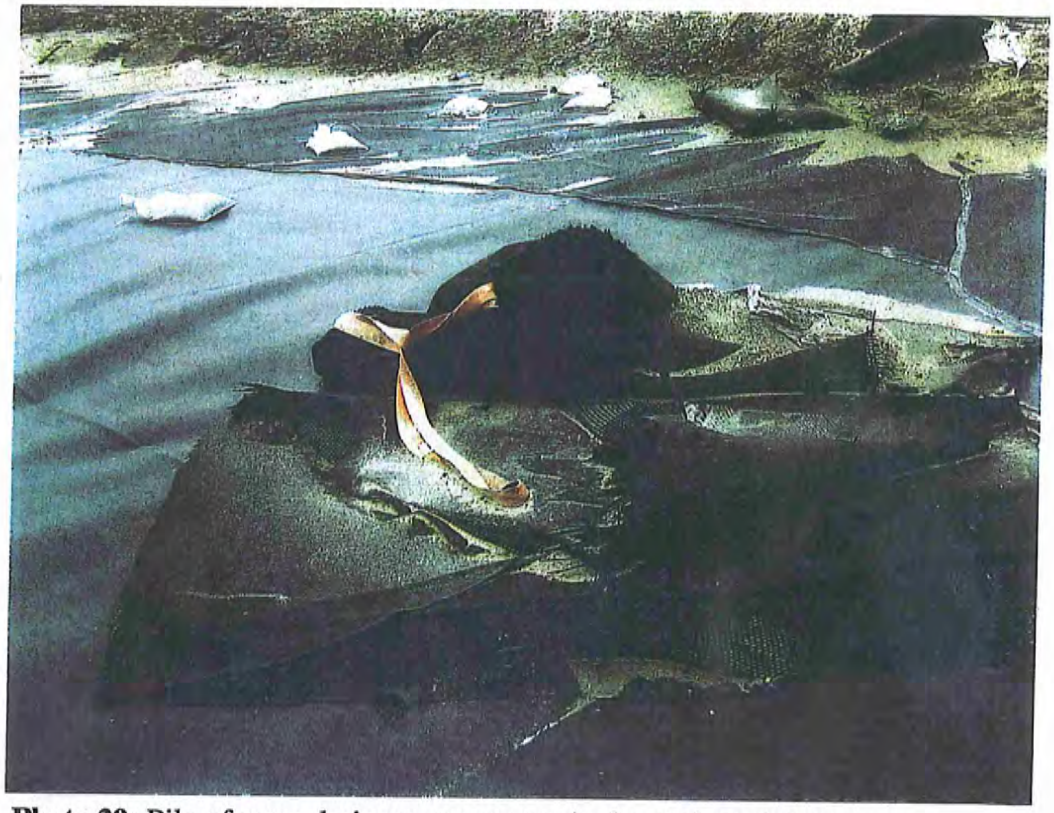
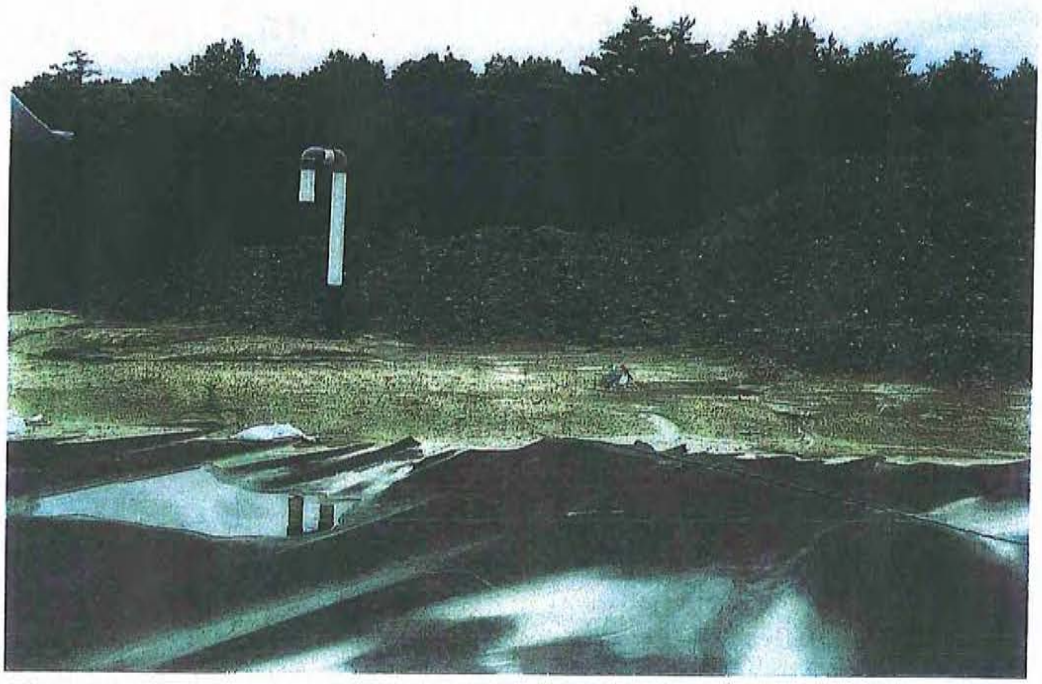


Photo 29: Pile of scrap drainage geocomposite located on plateau area.

Photo 30: Pile of soils located on northern side of plateau. Large rock and scrap drainage geocomposite observed in pile.



Photos 31 & 32: Layer of sand (approximately 6-inches) observed beneath soil pile on plateau.

Photo 33: Panel installation QC information on geomembrane.

Photo 34: Northern slope.

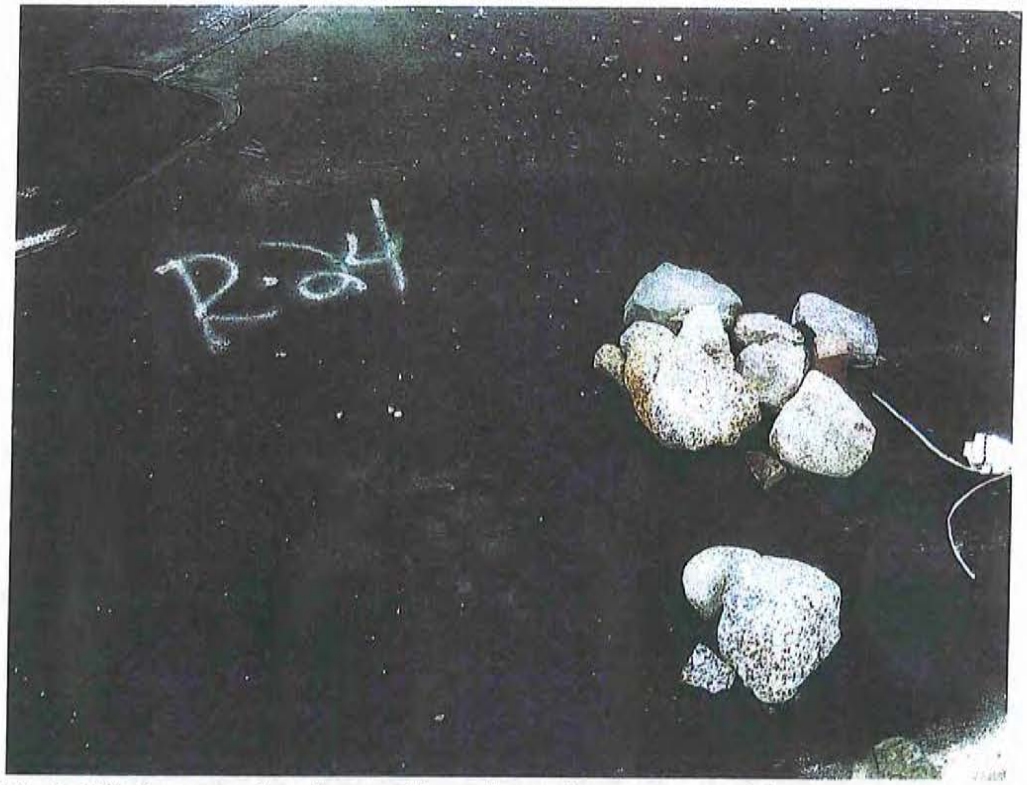


Photo 35: Large rocks observed in various places on top of the geomembrane. Knife blade also shown in this photo.

Photo 36: Pulling of geomembrane observed at vent located at the top of the northwestern slope. Liner at base of vent needs repair and boot connection.

Photo 37: Western slope. No vent on this slope as designed.

Photo 38: Western slope. No stormwater benches observed.

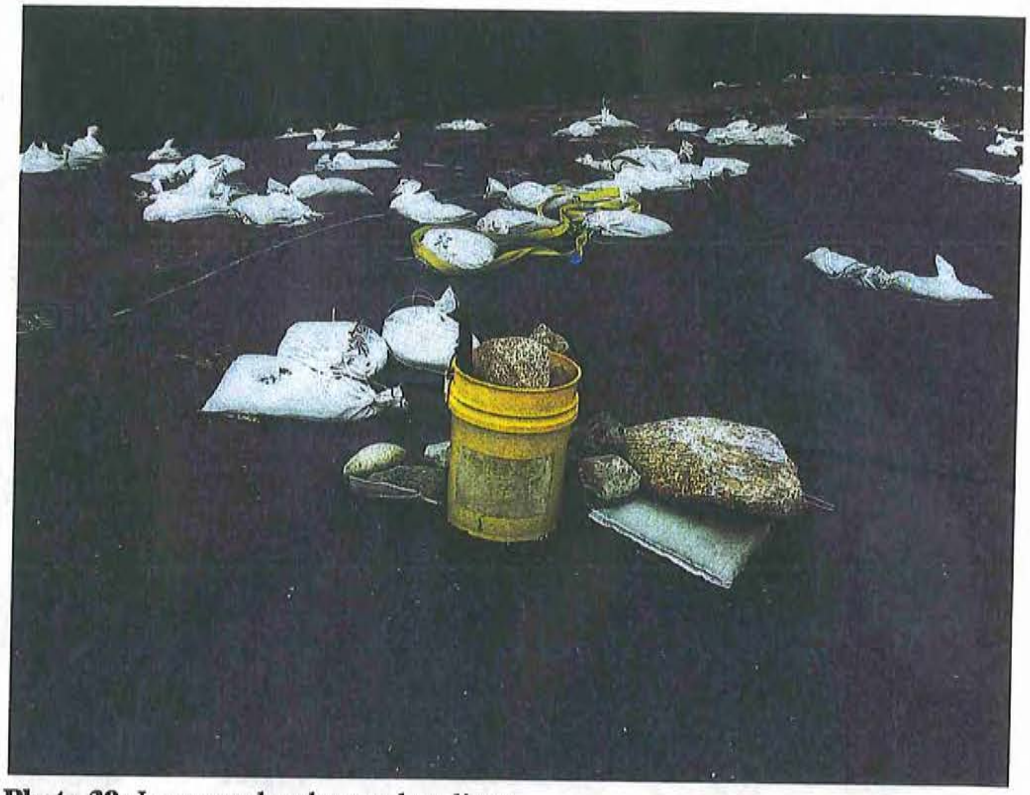


Photo 39: Large rocks observed on liner.

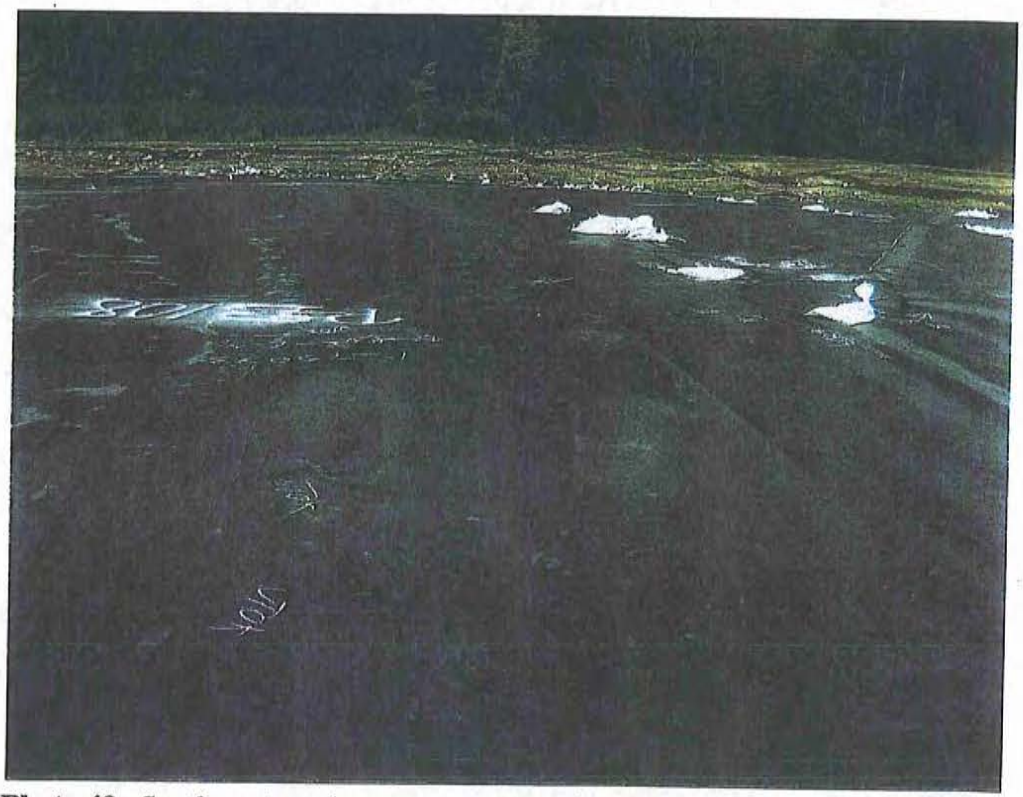


Photo 40: Southwestern slope; many creases in geomembrane observed. Significant creases were reinforced with extrusion welds.

Photo 41: Southern slope.

Photo 42: Southern slope, facing southeast.

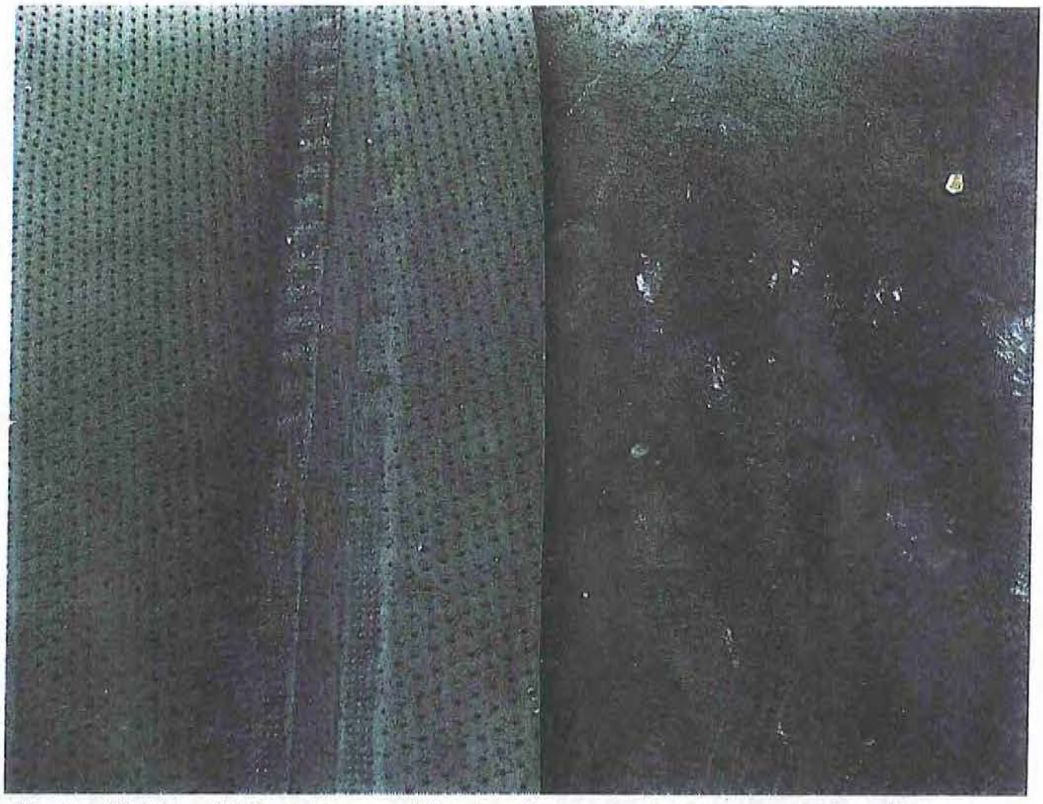


Photo 43: Two different types of textured geomembrane seamed together.

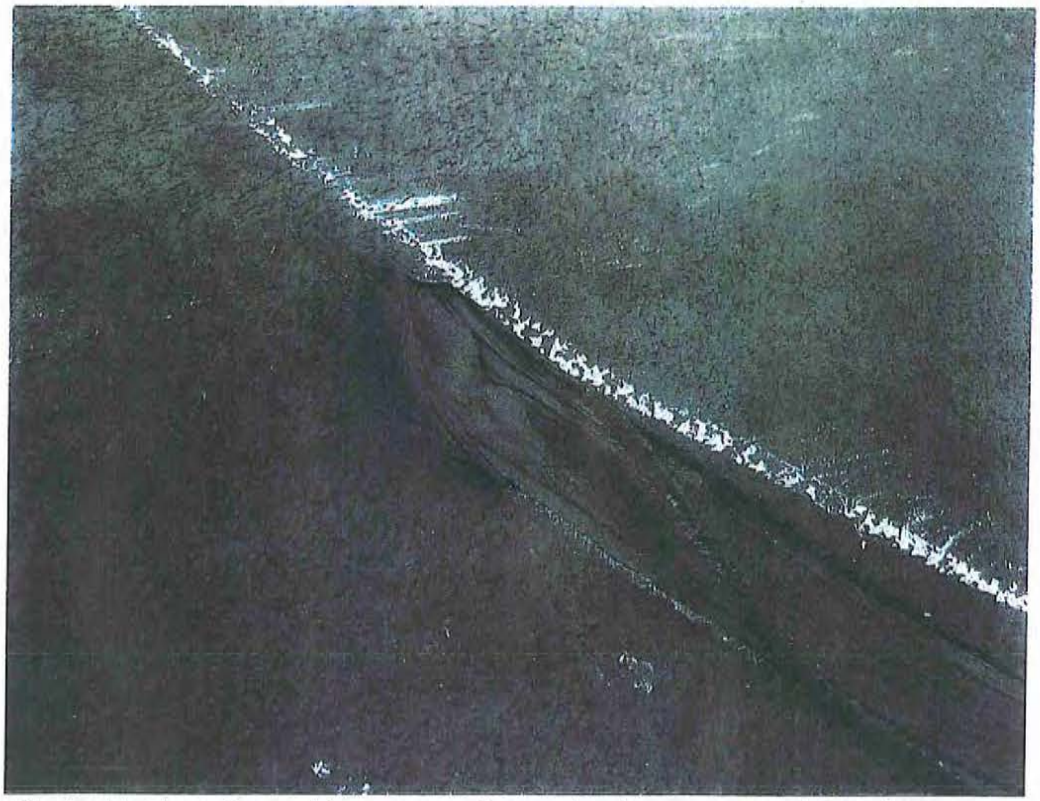


Photo 44: Extrusion weld on crease observed to have separated from liner at one end.

Photos 45 & 46: Creases in geomembrane on southern slope.

Photo 47: Toe of southern slope. Significant erosion observed.

Photo 48: Toe of southeastern slope. Significant erosion observed. No drainage swales observed.

Photo 49: Toe of southern slope; No anchor trench observed. Edge of landfill appeared to have been built up with imported soils.

Photo 50: Erosion at toe of southern slope (facing east). Brick and metal observed in soils.

Photo 51: Facing east; Erosion at toe of southern slope.

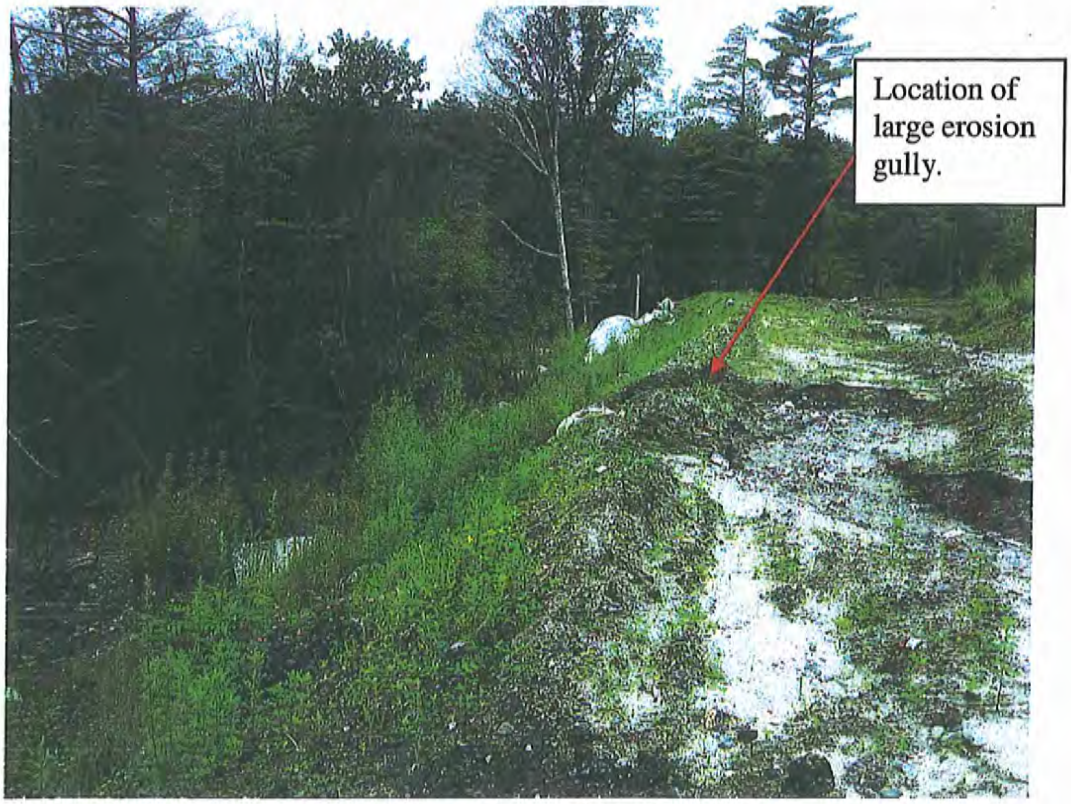


Photo 52: Facing west; Eroded berm at toe of southern slope.

Photo 53: Erosion gully located at toe of southern slope.

Photo 54: Erosion gully at toe of southern slope.

Photo 55: Downgradient of erosion gully.

Photo 56: Siltation of downgradient land and wetlands resulting from erosion along southern toe of slope.

Photo 57: Siltation of downgradient land and wetlands resulting from erosion along southern toe of slope.

Photo 58: Siltation of downgradient land and wetlands resulting from erosion along southern toe of slope.

Photo 59: Toe of southwestern slope. HDPE liner ends at top of berm shown.

Photo 60: Southwest corner of landfill, facing south; Large rocks at edge of wetlands, scrap liner in wetlands.

Photo 61: Stormwater basin located at west end of landfill.

Photo 62: Sedimentation of downgradient land and wetlands located west of stormwater basin.

Photo 63: Toe of northwestern slope, facing northeast. Exposed waste observed in eroded areas.

Photo 64: Exposed waste along northwestern perimeter of landfill.

Photo 65: Exposed waste along northwestern perimeter of landfill.

Photo 66: Erosion in northwest corner of landfill. Waste exposed in erosion gully.

Photo 67: Northwest toe of slope, facing southwest.

Photo 68: Northern side of landfill; access road built around perimeter of landfill with gravelly-sandy material that contains brick, some metal, pieces of PVC pipe, glass, pottery, etc.

Photo 69: Northeastern perimeter of landfill, facing east.

Photo 70: Pile of soils at top of plateau area. No access road over the geomembrane was observed.

Photo 71: Pile of soils in northeastern corner of landfill.

Photo 72: Pile of soils in northeastern corner of landfill.

Photo 73: Soil pile; facing east.

Attachment C

Test Results for Gas Venting/Bedding Layer

BATG

September 24, 2008

Mr. Wallace E. Hack, P.E.
Department of Environmental Protection
Central Region
627 Main Street
Worcester, Massachusetts 01608

Subject: **Flint Road Landfill Closure**
Charlton, MA
Geocomposite Vent and Drainage Layers

Dear Mr. Hack:

This letter is a formal request to substitute the sand venting and drainage layers with the SKAPS Transnet HDPE Geocomposite 160 at the Flint Road Landfill - attached is the technical data sheet for the product we are proposing to use. Additionally, we would like to increase the thickness of the borrow layer and the vegetative support layer from six inches to eight inches and from six inches to ten inches respectively. This will allow us to maintain a n eighteen inch depth above the liner to facilitate the installation of the drainage swales.

If you need any additional information please do not hesitate to contact the undersigned.

Sincerely,

Alan B. Duncan, P.E.
Executive Vice President

Cc: D. D'Amore, D'Amore & Associates

448 Broadway • Taunton, MA 02780
Tel: 508.824.7412 • Fax: 508.880.7565

SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529 (U.S.A.)
Phone (706) 336-7000 Fax (706) 336-7007
e-mail: info@skaps.com

SKAPS TRANSNET™ (TN)
HDPE GEOCOMPOSITE 160

SKAPS TRANSNET™ geocomposite consists of SKAPS GeoNet made from HDPE resin with non-woven polypropylene geotextile fabric heat bonded on both sides of the the geonet.

Property	Test Method	Unit	Required Value		Qualifier
			With 6 Oz.	With 8 oz.	
Geonet					
Mass per Unit Area	ASTM D 5261	lb/ft^2	0.12	0.12	Minimum
Thickness	ASTM D 5199	mil.	160±10	160±10	Range
Carbon Black	ASTM D 4218	%	2 to 3	2 to 3	Range
Tensile Strength	ASTM D 5035	lb/in	30	30	Minimum
Melt Flow	ASTM D 1238[3]	g/10 min.	1	1	Minimum
Density	ASTM D 1505	g/cm^3	0.94	0.94	Minimum
Transmissivity[1]	ASTM D 4716	$m^2/sec.$	$1x10^{-3}$	$1x10^{-3}$	MARV[2]
Composite					
Ply Adhesion (Minimum)	GRI GC7	lb/in	0.5	0.5	MARV
Ply Adhesion (Average)	GRI GC7	lb/in	1	1	MARV
Transmissivity[1a]	ASTM D 4716	m^2/sec	$1x10^{-4}$	$1x10^{-4}$	MARV
Geotextile					
Fabric Weight	ASTM D 5261	oz/yd^2	6	8	MARV
Grab Strength	ASTM D 4632	lb	150	225	MARV
Grab Elongation	ASTM D 4632	%	50	50	MARV
Tear Strength	ASTM D 3786[4]	lb	60	90	MARV
Puncture Resistance	ASTM D 4833	lbs.	95	130	MARV
Mullen Burst	ASTM D 3786[3]	psi	325	450	MARV
Water Flow Rate	ASTM D 4491	gpm/ft^2	125	100	MARV
Permittivity	ASTM D 4491	sec^{-1}	1.63	1.26	MARV
Permeability	ASTM D 4491	cm/sec	0.48	0.3	MARV
AOS	ASTM D 4751	US Sieve	70	80	MARV

Notes:
1. Transmissivity measured using water at 21 ± 2°C (70 ± 4°F) with a gradient of 0.1 and a confining pressure of 10000 psf between stainless steel plates after 15 minutes. Values may vary between individual labs.
   1a. Transmissivity measured using water at 21 ± 2°C (70 ± 4°F) with a gradient of 0.1 and a confining pressure of 10000 psf between stainless steel plates after 15 minutes. Values may vary between individual labs.
2. MARV is statistically defined as mean minus two standard deviations and it is the value which is exceeded by 97.5% of all the test data.
3. Condition 190/2.16
4. Modified

BATG Environmental

Total Pages (Including this cover page): 3

Date: September 24, 2008

To: Wally Hack Company: Charlton (BOH)

From: Glen Duncan Fax #: 508-248-2375

Subject: Flint Rd Landfill Closure
Geocomposite Vent & Drainage Layers

Cc:

Comments:

STATEMENT OF CONFIDENTIALITY

The document(s) included with this facsimile transmittal sheet contain(s) information from BATG Environmental, Inc. which is confidential and/or privileged. This information is intended to be for the use of the addressee named on this transmittal sheet. If you are not the addressee, note that any disclosure, photocopying, distribution or use of the contents of this faxed information is prohibited. If you have received this facsimile in error, please notify us by telephone (508) 824-7412 immediately so that we can arrange for the retrieval of the original document(s) at no cost to you.

If you do not receive all pages, please call (508) 824-7412.

448 Broadway
Taunton, Massachusetts 02780
(508) 824-7412 Phone
(508) 880-7565 Fax

ENVIRONMENTAL CONSULTING AND REMEDIATION

\ADMIN\CCASALE\FORMS\BATG\BATGFAXMASTER2

Geotesting express
a subsidiary of Gregcourt Corporation

Client:	UTS of Massachusetts		
Project Name:	W.L. French Excavating		
Project Location:	Charlton MA		
GTX #:	8626		
Start Date:	11/04/08	Tested By:	ema
End Date:	11/05/08	Checked By:	jdt
Boring #:	---		
Sample #:	Sample 103		
Depth:	---		
Visual Description:	Dry, pale yellow silty sand		

Permeability of Granular Soils (Constant Head) by ASTM D 2434

Sample Type: Remolded

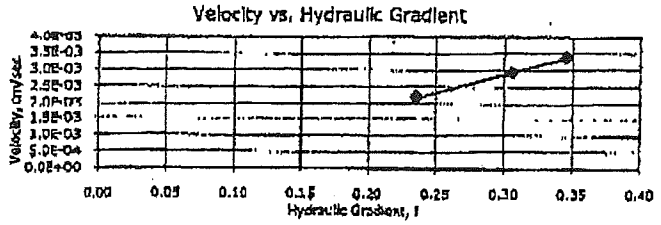
Sample Information:

Maximum Dry Density:	--- pcf
Optimum Moisture Content:	--- %
Compaction Test Method:	---
Classification (ASTM D 2487):	---
Assumed Specific Gravity:	2.65

Sample Preparation / Test Setup: Target Compaction: 95% of 117.2 pcf (value provided by client) at air-dried moisture content; >3/8 inch material screened out of sample prior to testing. 5.27 lb surcharge

Parameter	Initial	Final
Height, in	4.03	4.03
Diameter, in	3.98	3.98
Area, in^2	12.4	12.4
Volume, in^3	50.1	50.1
Mass, g	1465	1730
Bulk Density, pcf	111	131
Moisture Content, %	0.3	18.2
Dry Density, pcf	111	111
Degree of Saturation, %	---	98.9
Void Ratio, e	---	0.49

Date	Reading #	Volume of Flow, cc	Time of Flow, sec	Flow Rate, cc/sec	Gradient	Permeability, cm/sec	Temp., °C	Correction Factor	Permeability @ 20 °C, cm/sec
11/04	1	1.74	10	0.17	0.24	9.2E-03	15.0	1.135	1.0E-02
11/04	2	1.80	10	0.18	0.24	9.6E-03	15.0	1.135	1.1E-02
11/04	3	1.73	10	0.17	0.24	9.2E-03	15.0	1.135	1.0E-02
11/04	4	2.34	10	0.23	0.31	9.6E-03	15.0	1.135	1.1E-02
11/04	5	2.35	10	0.24	0.31	9.6E-03	15.0	1.135	1.1E-02
11/04	6	2.35	10	0.24	0.31	9.6E-03	15.0	1.135	1.1E-02
11/04	7	2.68	10	0.27	0.35	9.7E-03	15.0	1.135	1.1E-02
11/04	8	2.74	10	0.27	0.45	9.9E-03	15.0	1.135	1.1E-02
11/04	9	2.73	10	0.27	0.35	9.9E-03	15.0	1.135	1.1E-02



PERMEABILITY @ 20 °C = 1.1 x 10^{-2} cm/sec

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	BATG Environmental		
Project Name:	Charlton Landfill		
Project Location:	Charlton, MA		
GTX #:	8623		
Start Date:	11/06/08	Tested By:	ema
End Date:	11/06/08	Checked By:	rmt
Boring #:	---		
Sample #:	Sand		
Depth:	---		
Visual Description:	Dry, yellowish brown silty sand		

Permeability of Granular Soils (Constant Head) by ASTM D 2434

Sample Type: Remolded

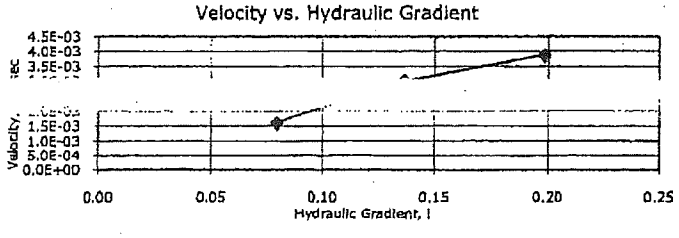
Sample Information:

Maximum Dry Density:	--- pcf
Optimum Moisture Content:	--- %
Compaction Test Method:	ASTM D 1557
Classification (ASTM D 2487):	---
Assumed Specific Gravity:	2.65

Sample Preparation / Test Setup: Compacted with moderate to dense effort at air-dried moisture content; >3/8 inch material screened out of sample prior to testing (7.0% of sample). 5.27 lb surcharge

Parameter	Initial	Final
Height, in	4.03	4.03
Diameter, in	3.98	3.98
Area, in^2	12.4	12.4
Volume, in^3	50.1	50.1
Mass, g	1629	1822
Bulk Density, pcf	124	138
Moisture Content, %	0.7	12.7
Dry Density, pcf	123	123
Degree of Saturation, %	---	96.9
Void Ratio, e	---	0.35

Date	Reading #	Volume of Flow, cc	Time of Flow, sec	Flow Rate, cc/sec	Gradient	Permeability, cm/sec	Temp., °C	Correction Factor	Permeability @ 20 °C, cm/sec
11/6	1	1.91	15	0.13	0.08	2.0E-02	15.0	1.135	2.3E-02
11/6	2	1.96	15	0.13	0.08	2.1E-02	15.0	1.135	2.3E-02
11/6	3	1.96	15	0.13	0.08	2.1E-02	15.0	1.135	2.3E-02
11/6	4	3.63	15	0.24	0.14	2.2E-02	15.0	1.135	2.5E-02
11/6	5	3.64	15	0.24	0.14	2.2E-02	15.0	1.135	2.5E-02
11/6	6	3.61	15	0.24	0.14	2.2E-02	15.0	1.135	2.5E-02
11/6	7	4.69	15	0.31	0.20	2.0E-02	15.0	1.135	2.2E-02
11/6	8	4.69	15	0.31	0.20	2.0E-02	15.0	1.135	2.2E-02
11/6	9	4.60	15	0.31	0.20	1.9E-02	15.0	1.135	2.2E-02



PERMEABILITY @ 20 °C =

2.3×10^{-2} cm/sec

Attachment D

Laboratory Analysis Reports for Soil Stockpiles

Sample Results Comparison with MCP S1/GW-2 Criteria.																						
LOCATION			SS-1		SS-2		SS-3		SS-4		SS-5		SS-6		SS-7		SS-8		SS-9		SS-10	
SAMPLING DATE			15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08	
LAB SAMPLE ID			L0818553-01		L0818553-02		L0818553-03		L0818553-04		L0818553-05		L0818553-06		L0818553-07		L0818553-08		L0818553-09		L0818553-10	
	S1/G2-08	Units		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual
Solids, Total		%	79		78		84		84		80		83		84		85		83		82	
Total Metals by MCP 6000/7000 series																						
Arsenic, Total	20	mg/kg	7.4		5.4		5.5		5.7		4.8		7.2		6.4		7.2		3.5		7.3	
Barium, Total	1000	mg/kg	72		74		46		53		80		230		53		68		35		54	
Cadmium, Total	2	mg/kg	0.58	U	0.62	U	0.55	U	0.59	U	0.6	U	0.58	U	0.57	U	0.56	U	0.56	U	0.59	U
Chromium, Total	30	mg/kg	19		20		15		16		20		19		21		17		11		21	
Lead, Total	300	mg/kg	170		160		92		110		200		280		98		140		38		100	
Mercury, Total	20	mg/kg	0.19		0.2		0.65		0.54		0.11		0.7		0.53		0.84		0.19		0.09	U
Selenium, Total	400	mg/kg	2.9	U	3.1	U	2.7	U	2.9	U	3	U	2.9	U	2.8	U	2.8	U	2.8	U	3	U
Silver, Total	100	mg/kg	0.58	U	0.62	U	0.55	U	0.59	U	0.6	U	0.58	U	0.57	U	0.56	U	0.56	U	0.59	U
Extractable Petroleum Hydrocarbons																						
2-Methylnaphthalene	80	mg/kg	0.422	U	0.427	U	0.794	U	0.794	U	0.833	U	0.402	U	0.397	U	0.784	U	1.61	U	0.406	U
Acenaphthene	1000	mg/kg	0.422	U	0.427	U	0.794	U	0.794	U	0.833	U	0.402	U	0.397	U	0.784	U	1.61	U	0.406	U
Acenaphthylene	600	mg/kg	0.422	U	0.427	U	0.794	U	0.794	U	0.833	U	0.402	U	0.397	U	0.784	U	1.61	U	0.406	U
Anthracene	1000	mg/kg	0.422	U	0.427	U	0.794	U	0.794	U	0.833	U	0.402	U	0.397	U	0.784	U	1.61	U	0.406	U
Benzo(a)anthracene	7	mg/kg	0.422	U	0.529		1.51		1.34		0.833	U	1.21		0.85		1.24		1.61	U	0.406	U
Benzo(a)pyrene	2	mg/kg	0.422	U	0.604		1.52		1.31		0.833	U	1.4		0.923		1.31		1.61	U	0.406	U
Benzo(b)fluoranthene	7	mg/kg	0.422	U	0.54		1.33		1.1		0.833	U	1.12		0.763		1.17		1.61	U	0.406	U
Benzo(ghi)perylene	1000	mg/kg	0.422	U	0.427	U	0.808		0.794	U	0.833	U	0.769		0.537		0.784	U	1.61	U	0.406	U
Benzo(k)fluoranthene	70	mg/kg	0.422	U	0.652		1.41		1.16		0.833	U	1.13		0.76		1.08		1.61	U	0.406	U
C11-C22 Aromatics		mg/kg	25.4		51.1		111		107		105		93.5		59.7		158		57.5		30.8	
C11-C22 Aromatics, Adjusted	1000	mg/kg	22.6		44.7		91.8		91.2		104		79.2		49.9		143		57.5		29.6	
C19-C36 Aliphatics	3000	mg/kg	15.7		33.6		66.6		70.6		94.7		62.9		49.8		122		35.1		27.6	
C9-C18 Aliphatics	1000	mg/kg	8.44	U	8.55	U	15.9	U	15.9	U	16.7	U	8.95		7.94	U	15.7	U	32.1	U	8.13	U
Chrysene	70	mg/kg	0.462		0.646		1.82		1.56		0.833	U	1.44		0.948		1.5		1.61	U	0.406	U
Dibenzo(a,h)anthracene	0.7	mg/kg	0.422	U	0.427	U	0.794	U	0.794	U	0.833	U	0.402	U	0.397	U	0.784	U	1.61	U	0.406	U
Fluoranthene	1000	mg/kg	0.858		1.21		3.67		2.79		0.857		2.22		1.66		2.85		1.61	U	0.61	
Fluorene	1000	mg/kg	0.422	U	0.427	U	0.794	U	0.794	U	0.833	U	0.402	U	0.397	U	0.784	U	1.61	U	0.406	U
Indeno(1,2,3-cd)Pyrene	7	mg/kg	0.422	U	0.435		0.991		0.822		0.833	U	0.902		0.615		0.868		1.61	U	0.406	U
Naphthalene	40	mg/kg	0.422	U	0.427	U	0.794	U	0.794	U	0.833	U	0.402	U	0.397	U	0.784	U	1.61	U	0.406	U
Phenanthrene	500	mg/kg	0.638		0.668		2.79		2.49		0.833	U	1.71		1.06		2.43		1.61	U	0.406	U
Pyrene	1000	mg/kg	0.756		1.15		3.16		2.99		0.833	U	2.35		1.71		2.8		1.61	U	0.589	

Sample Results Summary with MCP S1/GW-1 Criteria.																								
LOCATION			SS-1		SS-2		SS-3		SS-4		SS-5		SS-6		SS-7		SS-8		SS-9		SS-10			
SAMPLING DATE			15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08		15-DEC-08			
LAB SAMPLE ID			L0818553-01		L0818553-02		L0818553-03		L0818553-04		L0818553-05		L0818553-06		L0818553-07		L0818553-08		L0818553-09		L0818553-10			
	S1/G1-08	Units		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual		
Total Metals by MCP 6000/7000 seric																								
Extractable Petroleum Hydrocarbons																								
2-Methylnaphthalene	0.7	mg/kg	0.422	U	0.427	U	0.794	U	0.794	U	0.833	U	0.402	U	0.397	U	0.784	U	1.61	U	0.406	U		
Acenaphthylene	1	mg/kg	0.422	U	0.427	U	0.794	U	0.794	U	0.833	U	0.402	U	0.397	U	0.784	U	1.61	U	0.406	U		
Dibenzo(a,h)anthracene	0.7	mg/kg	0.422	U	0.427	U	0.794	U	0.794	U	0.833	U	0.402	U	0.397	U	0.784	U	1.61	U	0.406	U		

ALPHA ANALYTICAL

ANALYTICAL REPORT

Lab Number:	L0818553
Client:	Camp Dresser & McKee, Inc. 1 Cambridge Place 50 Hampshire Street Cambridge, MA 02139
ATTN:	Vin Recchia
Project Name:	CHARLTON LANDFILL
Project Number:	75398-67217
Report Date:	12/24/08

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (2003), NJ (MA935), RI (LAO00065), ME (MA0086), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Alpha Sample ID	Client ID	Sample Location
L0818553-01	SS-1	CHARLTON, MA
L0818553-02	SS-2	CHARLTON, MA
L0818553-03	SS-3	CHARLTON, MA
L0818553-04	SS-4	CHARLTON, MA
L0818553-05	SS-5	CHARLTON, MA
L0818553-06	SS-6	CHARLTON, MA
L0818553-07	SS-7	CHARLTON, MA
L0818553-08	SS-8	CHARLTON, MA
L0818553-09	SS-9	CHARLTON, MA
L0818553-10	SS-10	CHARLTON, MA

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A, B, C & D is required for "Presumptive Certainty" status		
A	Were all samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation for the data set?	YES
B	Were all QA/QC procedures required for the specified analytical methods(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	YES
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in section 2.0 of the MADEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	YES
D	VPH and EPH methods only: Was the VPH or EPH method run without significant modifications, as specified in Section 11.3?	YES

A response to questions E and F is required for "Presumptive Certainty" status		
E	Were all QC performance standards and recommendations for the specified method(s) achieved?	NO
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553
Project Number: 75398-67217 **Report Date:** 12/24/08

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

MCP Related Narratives

EPH

L0818553-03 through -05, -08 and -09 have elevated detection limits due to the dilutions required by matrix interferences encountered during the concentration of the samples.

In reference to question E:

The WG347747-2/-3 LCS/LCSD RPDs associated with L0818553-02 through -10 are above the acceptance criteria for Nonane (C9)(36%) and Decane (C10)(27%); however, the individual LCS/LCSD recoveries are within method limits. The results of the associated samples are reported.

The WG348030-2 LCS recovery associated with L0818553-01 was outside the acceptance criteria for Decane (C10)(36%); however, the target carbon ranges and analytes were within method criteria. The results of the original analysis are reported. In addition, the associated WG348030-2/-3 LCS/LCSD RPD is above the

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553
Project Number: 75398-67217 **Report Date:** 12/24/08

Case Narrative (continued)

acceptance criteria for Decane (C10)(31%).

The WG348030-2/-3 LCS/LCSD RPDs associated with L0818553-01 are above the acceptance criteria for Naphthalene (27%), 2-Methylnaphthalene (28%), Nonane (C9)(32%), and Dodecane (C12)(28%); however, the individual LCS/LCSD recoveries are within method limits. The results of the associated samples are reported.

Metals

In reference to question E:

The WG347690-1 Method Blank, associated with L0818553-02 through -10, has a concentration above the reporting limit for Chromium. Since the associated sample concentrations are 10x the blank concentration for this analyte, no corrective action is required. The results of the original analyses are reported.

In reference to question F:

All samples were analyzed for a subset of MCP elements per the Chain of Custody.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Elizabeth A. Simmons

Title: Technical Director/Representative Date: 12/24/08

ORGANICS

PETROLEUM HYDROCARBONS

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

Lab ID:	L0818553-01	Date Collected:	12/15/08 11:00
Client ID:	SS-1	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/22/08 15:25
Analytical Date:	12/24/08 08:27	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/23/08
Percent Solids:	79%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons					
C9-C18 Aliphatics	ND		mg/kg	8.44	1
C19-C36 Aliphatics	15.7		mg/kg	8.44	1
C11-C22 Aromatics	25.4		mg/kg	8.44	1
C11-C22 Aromatics, Adjusted	22.6		mg/kg	8.44	1
Naphthalene	ND		mg/kg	0.422	1
2-Methylnaphthalene	ND		mg/kg	0.422	1
Acenaphthylene	ND		mg/kg	0.422	1
Acenaphthene	ND		mg/kg	0.422	1
Fluorene	ND		mg/kg	0.422	1
Phenanthrene	0.638		mg/kg	0.422	1
Anthracene	ND		mg/kg	0.422	1
Fluoranthene	0.858		mg/kg	0.422	1
Pyrene	0.756		mg/kg	0.422	1
Benzo(a)anthracene	ND		mg/kg	0.422	1
Chrysene	0.462		mg/kg	0.422	1
Benzo(b)fluoranthene	ND		mg/kg	0.422	1
Benzo(k)fluoranthene	ND		mg/kg	0.422	1
Benzo(a)pyrene	ND		mg/kg	0.422	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.422	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.422	1
Benzo(ghi)perylene	ND		mg/kg	0.422	1

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-01 Date Collected: 12/15/08 11:00

Client ID: SS-1 Date Received: 12/17/08

Sample Location: CHARLTON, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	45		40-140
o-Terphenyl	59		40-140
2-Fluorobiphenyl	73		40-140
2-Bromonaphthalene	77		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

Lab ID:	L0818553-02	Date Collected:	12/15/08 11:02
Client ID:	SS-2	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 14:33	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	78%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons					
C9-C18 Aliphatics	ND		mg/kg	8.55	1
C19-C36 Aliphatics	33.6		mg/kg	8.55	1
C11-C22 Aromatics	51.1		mg/kg	8.55	1
C11-C22 Aromatics, Adjusted	44.7		mg/kg	8.55	1
Naphthalene	ND		mg/kg	0.427	1
2-Methylnaphthalene	ND		mg/kg	0.427	1
Acenaphthylene	ND		mg/kg	0.427	1
Acenaphthene	ND		mg/kg	0.427	1
Fluorene	ND		mg/kg	0.427	1
Phenanthrene	0.668		mg/kg	0.427	1
Anthracene	ND		mg/kg	0.427	1
Fluoranthene	1.21		mg/kg	0.427	1
Pyrene	1.15		mg/kg	0.427	1
Benzo(a)anthracene	0.529		mg/kg	0.427	1
Chrysene	0.646		mg/kg	0.427	1
Benzo(b)fluoranthene	0.540		mg/kg	0.427	1
Benzo(k)fluoranthene	0.652		mg/kg	0.427	1
Benzo(a)pyrene	0.604		mg/kg	0.427	1
Indeno(1,2,3-cd)Pyrene	0.435		mg/kg	0.427	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.427	1
Benzo(ghi)perylene	ND		mg/kg	0.427	1

'roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

'roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

_ab ID: L0818553-02 Date Collected: 12/15/08 11:02

Client ID: SS-2 Date Received: 12/17/08

Sample Location: CHARLTON, MA Field Prep: Not Specified

arameter	Result	Qualifier	Units	RDL	Dilution Factor

xtractable Petroleum Hydrocarbons

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	57		40-140
o-Terphenyl	68		40-140
2-Fluorobiphenyl	74		40-140
2-Bromonaphthalene	78		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

Lab ID:	L0818553-03	Date Collected:	12/15/08 11:04
Client ID:	SS-3	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 15:36	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	84%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons					
C9-C18 Aliphatics	ND		mg/kg	15.9	2
C19-C36 Aliphatics	66.6		mg/kg	15.9	2
C11-C22 Aromatics	111		mg/kg	15.9	2
C11-C22 Aromatics, Adjusted	91.8		mg/kg	15.9	2
Naphthalene	ND		mg/kg	0.794	2
2-Methylnaphthalene	ND		mg/kg	0.794	2
Acenaphthylene	ND		mg/kg	0.794	2
Acenaphthene	ND		mg/kg	0.794	2
Fluorene	ND		mg/kg	0.794	2
Phenanthrene	2.79		mg/kg	0.794	2
Anthracene	ND		mg/kg	0.794	2
Fluoranthene	3.67		mg/kg	0.794	2
Pyrene	3.16		mg/kg	0.794	2
Benzo(a)anthracene	1.51		mg/kg	0.794	2
Chrysene	1.82		mg/kg	0.794	2
Benzo(b)fluoranthene	1.33		mg/kg	0.794	2
Benzo(k)fluoranthene	1.41		mg/kg	0.794	2
Benzo(a)pyrene	1.52		mg/kg	0.794	2
Indeno(1,2,3-cd)Pyrene	0.991		mg/kg	0.794	2
Dibenzo(a,h)anthracene	ND		mg/kg	0.794	2
Benzo(ghi)perylene	0.808		mg/kg	0.794	2

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-03 Date Collected: 12/15/08 11:04

Client ID: SS-3 Date Received: 12/17/08

Sample Location: CHARLTON, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	59		40-140
o-Terphenyl	86		40-140
2-Fluorobiphenyl	74		40-140
2-Bromonaphthalene	77		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

Lab ID:	L0818553-04	Date Collected:	12/15/08 11:06
Client ID:	SS-4	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 15:05	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	84%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons					
C9-C18 Aliphatics	ND		mg/kg	15.9	2
C19-C36 Aliphatics	70.6		mg/kg	15.9	2
C11-C22 Aromatics	107		mg/kg	15.9	2
C11-C22 Aromatics, Adjusted	91.2		mg/kg	15.9	2
Naphthalene	ND		mg/kg	0.794	2
2-Methylnaphthalene	ND		mg/kg	0.794	2
Acenaphthylene	ND		mg/kg	0.794	2
Acenaphthene	ND		mg/kg	0.794	2
Fluorene	ND		mg/kg	0.794	2
Phenanthrene	2.49		mg/kg	0.794	2
Anthracene	ND		mg/kg	0.794	2
Fluoranthene	2.79		mg/kg	0.794	2
Pyrene	2.99		mg/kg	0.794	2
Benzo(a)anthracene	1.34		mg/kg	0.794	2
Chrysene	1.56		mg/kg	0.794	2
Benzo(b)fluoranthene	1.10		mg/kg	0.794	2
Benzo(k)fluoranthene	1.16		mg/kg	0.794	2
Benzo(a)pyrene	1.31		mg/kg	0.794	2
Indeno(1,2,3-cd)Pyrene	0.822		mg/kg	0.794	2
Dibenzo(a,h)anthracene	ND		mg/kg	0.794	2
Benzo(ghi)perylene	ND		mg/kg	0.794	2

'roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

'roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

.ab ID: L0818553-04 Date Collected: 12/15/08 11:06

Client ID: SS-4 Date Received: 12/17/08

Sample Location: CHARLTON, MA Field Prep: Not Specified

arameter	Result	Qualifier	Units	RDL	Dilution Factor

xtractable Petroleum Hydrocarbons

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	68		40-140
o-Terphenyl	86		40-140
2-Fluorobiphenyl	73		40-140
2-Bromonaphthalene	77		40-140

roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

ab ID:	L0818553-05	Date Collected:	12/15/08 11:08
lient ID:	SS-5	Date Received:	12/17/08
ample Location:	CHARLTON, MA	Field Prep:	Not Specified
latrix:	Soil	Extraction Method:	EPA 3546
nalytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
nalytical Date:	12/23/08 07:00	Cleanup Method1:	EPH-04-1
nalyst:	AS	Cleanup Date1:	12/22/08
ercent Solids:	80%		

Quality Control Information

ondition of sample received:	Satisfactory
ample Temperature upon receipt:	Received on Ice
ample Extraction method:	Extracted Per the Method

arameter	Result	Qualifier	Units	RDL	Dilution Factor
xtractable Petroleum Hydrocarbons					
9-C18 Aliphatics	ND		mg/kg	16.7	2
19-C36 Aliphatics	94.7		mg/kg	16.7	2
11-C22 Aromatics	105		mg/kg	16.7	2
11-C22 Aromatics, Adjusted	104		mg/kg	16.7	2
laphthalene	ND		mg/kg	0.833	2
-Methylnaphthalene	ND		mg/kg	0.833	2
cenaphthylene	ND		mg/kg	0.833	2
cenaphthene	ND		mg/kg	0.833	2
luorene	ND		mg/kg	0.833	2
henanthrene	ND		mg/kg	0.833	2
nthracene	ND		mg/kg	0.833	2
luoranthene	0.857		mg/kg	0.833	2
yrene	ND		mg/kg	0.833	2
enzo(a)anthracene	ND		mg/kg	0.833	2
hrysene	ND		mg/kg	0.833	2
enzo(b)fluoranthene	ND		mg/kg	0.833	2
enzo(k)fluoranthene	ND		mg/kg	0.833	2
enzo(a)pyrene	ND		mg/kg	0.833	2
ndeno(1,2,3-cd)Pyrene	ND		mg/kg	0.833	2
ibenzo(a,h)anthracene	ND		mg/kg	0.833	2
enzo(ghi)perylene	ND		mg/kg	0.833	2

'roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

'roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

_ab ID: L0818553-05 Date Collected: 12/15/08 11:08

Client ID: SS-5 Date Received: 12/17/08

Sample Location: CHARLTON, MA Field Prep: Not Specified

arameter	Result	Qualifier	Units	RDL	Dilution Factor

xtractable Petroleum Hydrocarbons

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	55		40-140
o-Terphenyl	77		40-140
2-Fluorobiphenyl	68		40-140
2-Bromonaphthalene	77		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

Lab ID:	L0818553-06	Date Collected:	12/15/08 11:10
Client ID:	SS-6	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 12:12	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	83%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons					
C9-C18 Aliphatics	8.95		mg/kg	8.03	1
C19-C36 Aliphatics	62.9		mg/kg	8.03	1
C11-C22 Aromatics	93.5		mg/kg	8.03	1
C11-C22 Aromatics, Adjusted	79.2		mg/kg	8.03	1
Naphthalene	ND		mg/kg	0.402	1
2-Methylnaphthalene	ND		mg/kg	0.402	1
Acenaphthylene	ND		mg/kg	0.402	1
Acenaphthene	ND		mg/kg	0.402	1
Fluorene	ND		mg/kg	0.402	1
Phenanthrene	1.71		mg/kg	0.402	1
Anthracene	ND		mg/kg	0.402	1
Fluoranthene	2.22		mg/kg	0.402	1
Pyrene	2.35		mg/kg	0.402	1
Benzo(a)anthracene	1.21		mg/kg	0.402	1
Chrysene	1.44		mg/kg	0.402	1
Benzo(b)fluoranthene	1.12		mg/kg	0.402	1
Benzo(k)fluoranthene	1.13		mg/kg	0.402	1
Benzo(a)pyrene	1.40		mg/kg	0.402	1
Indeno(1,2,3-cd)Pyrene	0.902		mg/kg	0.402	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.402	1
Benzo(ghi)perylene	0.769		mg/kg	0.402	1

'roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

'roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

_ab ID: L0818553-06 Date Collected: 12/15/08 11:10

Client ID: SS-6 Date Received: 12/17/08

Sample Location: CHARLTON, MA Field Prep: Not Specified

arameter	Result	Qualifier	Units	RDL	Dilution Factor

xtractable Petroleum Hydrocarbons

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	72		40-140
o-Terphenyl	88		40-140
2-Fluorobiphenyl	93		40-140
2-Bromonaphthalene	98		40-140

roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

ab ID:	L0818553-07	Date Collected:	12/15/08 11:12
lient ID:	SS-7	Date Received:	12/17/08
ample Location:	CHARLTON, MA	Field Prep:	Not Specified
latrix:	Soil	Extraction Method:	EPA 3546
nalytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
nalytical Date:	12/23/08 11:12	Cleanup Method1:	EPH-04-1
nalyst:	AS	Cleanup Date1:	12/22/08
ercent Solids:	84%		

Quality Control Information

ondition of sample received:	Satisfactory
ample Temperature upon receipt:	Received on Ice
ample Extraction method:	Extracted Per the Method

arameter	Result	Qualifier	Units	RDL	Dilution Factor
xtractable Petroleum Hydrocarbons					
9-C18 Aliphatics	ND		mg/kg	7.94	1
19-C36 Aliphatics	49.8		mg/kg	7.94	1
11-C22 Aromatics	59.7		mg/kg	7.94	1
11-C22 Aromatics, Adjusted	49.9		mg/kg	7.94	1
aphthalene	ND		mg/kg	0.397	1
-Methylnaphthalene	ND		mg/kg	0.397	1
cenaphthylene	ND		mg/kg	0.397	1
cenaphthene	ND		mg/kg	0.397	1
luorene	ND		mg/kg	0.397	1
henanthrene	1.06		mg/kg	0.397	1
nthracene	ND		mg/kg	0.397	1
luoranthene	1.66		mg/kg	0.397	1
yrene	1.71		mg/kg	0.397	1
enzo(a)anthracene	0.850		mg/kg	0.397	1
hrysene	0.948		mg/kg	0.397	1
enzo(b)fluoranthene	0.763		mg/kg	0.397	1
enzo(k)fluoranthene	0.760		mg/kg	0.397	1
enzo(a)pyrene	0.923		mg/kg	0.397	1
ideno(1,2,3-cd)Pyrene	0.615		mg/kg	0.397	1
ibenzo(a,h)anthracene	ND		mg/kg	0.397	1
enzo(ghi)perylene	0.537		mg/kg	0.397	1

roject Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
roject Number:	75398-67217	**Report Date:**	12/24/08

SAMPLE RESULTS

ab ID:	L0818553-07	Date Collected:	12/15/08 11:12
lient ID:	SS-7	Date Received:	12/17/08
ample Location:	CHARLTON, MA	Field Prep:	Not Specified

arameter	Result	Qualifier	Units	RDL	Dilution Factor

xtractable Petroleum Hydrocarbons

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	63		40-140
o-Terphenyl	67		40-140
2-Fluorobiphenyl	67		40-140
2-Bromonaphthalene	71		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

Lab ID:	L0818553-08	Date Collected:	12/15/08 11:14
Client ID:	SS-8	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 11:42	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons					
C9-C18 Aliphatics	ND		mg/kg	15.7	2
C19-C36 Aliphatics	122		mg/kg	15.7	2
C11-C22 Aromatics	158		mg/kg	15.7	2
C11-C22 Aromatics, Adjusted	143		mg/kg	15.7	2
Naphthalene	ND		mg/kg	0.784	2
2-Methylnaphthalene	ND		mg/kg	0.784	2
Acenaphthylene	ND		mg/kg	0.784	2
Acenaphthene	ND		mg/kg	0.784	2
Fluorene	ND		mg/kg	0.784	2
Phenanthrene	2.43		mg/kg	0.784	2
Anthracene	ND		mg/kg	0.784	2
Fluoranthene	2.85		mg/kg	0.784	2
Pyrene	2.80		mg/kg	0.784	2
Benzo(a)anthracene	1.24		mg/kg	0.784	2
Chrysene	1.50		mg/kg	0.784	2
Benzo(b)fluoranthene	1.17		mg/kg	0.784	2
Benzo(k)fluoranthene	1.08		mg/kg	0.784	2
Benzo(a)pyrene	1.31		mg/kg	0.784	2
Indeno(1,2,3-cd)Pyrene	0.868		mg/kg	0.784	2
Dibenzo(a,h)anthracene	ND		mg/kg	0.784	2
Benzo(ghi)perylene	ND		mg/kg	0.784	2

'roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

'roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

.ab ID: L0818553-08 Date Collected: 12/15/08 11:14

Client ID: SS-8 Date Received: 12/17/08

Sample Location: CHARLTON, MA Field Prep: Not Specified

arameter	Result	Qualifier	Units	RDL	Dilution Factor

xtractable Petroleum Hydrocarbons

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	66		40-140
o-Terphenyl	82		40-140
2-Fluorobiphenyl	74		40-140
2-Bromonaphthalene	81		40-140

roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

ab ID:	L0818553-09	Date Collected:	12/15/08 11:16
lient ID:	SS-9	Date Received:	12/17/08
ample Location:	CHARLTON, MA	Field Prep:	Not Specified
latrix:	Soil	Extraction Method:	EPA 3546
nalytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
nalytical Date:	12/23/08 10:12	Cleanup Method1:	EPH-04-1
nalyst:	AS	Cleanup Date1:	12/22/08
ercent Solids:	83%		

Quality Control Information

ondition of sample received:	Satisfactory
ample Temperature upon receipt:	Received on Ice
ample Extraction method:	Extracted Per the Method

arameter	Result	Qualifier	Units	RDL	Dilution Factor
xtractable Petroleum Hydrocarbons					
9-C18 Aliphatics	ND		mg/kg	32.1	4
19-C36 Aliphatics	35.1		mg/kg	32.1	4
11-C22 Aromatics	57.5		mg/kg	32.1	4
11-C22 Aromatics, Adjusted	57.5		mg/kg	32.1	4
aphthalene	ND		mg/kg	1.61	4
-Methylnaphthalene	ND		mg/kg	1.61	4
cenaphthylene	ND		mg/kg	1.61	4
cenaphthene	ND		mg/kg	1.61	4
luorene	ND		mg/kg	1.61	4
henanthrene	ND		mg/kg	1.61	4
nthracene	ND		mg/kg	1.61	4
luoranthene	ND		mg/kg	1.61	4
yrene	ND		mg/kg	1.61	4
enzo(a)anthracene	ND		mg/kg	1.61	4
hrysene	ND		mg/kg	1.61	4
enzo(b)fluoranthene	ND		mg/kg	1.61	4
enzo(k)fluoranthene	ND		mg/kg	1.61	4
enzo(a)pyrene	ND		mg/kg	1.61	4
ideno(1,2,3-cd)Pyrene	ND		mg/kg	1.61	4
ibenzo(a,h)anthracene	ND		mg/kg	1.61	4
enzo(ghi)perylene	ND		mg/kg	1.61	4

'roject Name: CHARLTON LANDFILL
'roject Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

_ab ID: L0818553-09
Client ID: SS-9
Sample Location: CHARLTON, MA

Date Collected: 12/15/08 11:16
Date Received: 12/17/08
Field Prep: Not Specified

arameter	Result	Qualifier	Units	RDL	Dilution Factor

xtractable Petroleum Hydrocarbons

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	74		40-140
o-Terphenyl	82		40-140
2-Fluorobiphenyl	82		40-140
2-Bromonaphthalene	84		40-140

roject Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
roject Number:	75398-67217	**Report Date:**	12/24/08

SAMPLE RESULTS

ab ID:	L0818553-10	Date Collected:	12/15/08 11:18
lient ID:	SS-10	Date Received:	12/17/08
ample Location:	CHARLTON, MA	Field Prep:	Not Specified
latrix:	Soil	Extraction Method:	EPA 3546
nalytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
nalytical Date:	12/23/08 10:42	Cleanup Method1:	EPH-04-1
nalyst:	AS	Cleanup Date1:	12/22/08
ercent Solids:	82%		

Quality Control Information

ondition of sample received:	Satisfactory
ample Temperature upon receipt:	Received on Ice
ample Extraction method:	Extracted Per the Method

arameter	Result	Qualifier	Units	RDL	Dilution Factor
xtractable Petroleum Hydrocarbons					
9-C18 Aliphatics	ND		mg/kg	8.13	1
19-C36 Aliphatics	27.6		mg/kg	8.13	1
11-C22 Aromatics	30.8		mg/kg	8.13	1
11-C22 Aromatics, Adjusted	29.6		mg/kg	8.13	1
aphthalene	ND		mg/kg	0.406	1
-Methylnaphthalene	ND		mg/kg	0.406	1
cenaphthylene	ND		mg/kg	0.406	1
cenaphthene	ND		mg/kg	0.406	1
luorene	ND		mg/kg	0.406	1
henanthrene	ND		mg/kg	0.406	1
nthracene	ND		mg/kg	0.406	1
luoranthene	0.610		mg/kg	0.406	1
yrene	0.589		mg/kg	0.406	1
enzo(a)anthracene	ND		mg/kg	0.406	1
hrysene	ND		mg/kg	0.406	1
enzo(b)fluoranthene	ND		mg/kg	0.406	1
enzo(k)fluoranthene	ND		mg/kg	0.406	1
enzo(a)pyrene	ND		mg/kg	0.406	1
ideno(1,2,3-cd)Pyrene	ND		mg/kg	0.406	1
ibenzo(a,h)anthracene	ND		mg/kg	0.406	1
enzo(ghi)perylene	ND		mg/kg	0.406	1

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-10 Date Collected: 12/15/08 11:18

Client ID: SS-10 Date Received: 12/17/08

Sample Location: CHARLTON, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	68		40-140
o-Terphenyl	61		40-140
2-Fluorobiphenyl	73		40-140
2-Bromonaphthalene	76		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 12/24/08

Method Blank Analysis
Batch Quality Control

Analytical Method: 61,EPH-04-1
Analytical Date: 12/23/08 01:30
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 12/19/08 02:41
Cleanup Method1: EPH-04-1
Cleanup Date1: 12/22/08

Parameter	Result	Qualifier	Units	RDL
Extractable Petroleum Hydrocarbons for sample(s): 02-10 Batch: WG347747-1				
C9-C18 Aliphatics	ND		mg/kg	6.67
C19-C36 Aliphatics	ND		mg/kg	6.67
C11-C22 Aromatics	ND		mg/kg	6.67
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.67
Naphthalene	ND		mg/kg	0.333
2-Methylnaphthalene	ND		mg/kg	0.333
Acenaphthylene	ND		mg/kg	0.333
Acenaphthene	ND		mg/kg	0.333
Fluorene	ND		mg/kg	0.333
Phenanthrene	ND		mg/kg	0.333
Anthracene	ND		mg/kg	0.333
Fluoranthene	ND		mg/kg	0.333
Pyrene	ND		mg/kg	0.333
Benzo(a)anthracene	ND		mg/kg	0.333
Chrysene	ND		mg/kg	0.333
Benzo(b)fluoranthene	ND		mg/kg	0.333
Benzo(k)fluoranthene	ND		mg/kg	0.333
Benzo(a)pyrene	ND		mg/kg	0.333
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.333
Dibenzo(a,h)anthracene	ND		mg/kg	0.333
Benzo(ghi)perylene	ND		mg/kg	0.333

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	71		40-140
o-Terphenyl	59		40-140
2-Fluorobiphenyl	69		40-140
2-Bromonaphthalene	71		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Method Blank Analysis
Batch Quality Control

Analytical Method: 61,EPH-04-1
Analytical Date: 12/24/08 03:59
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 12/22/08 15:25
Cleanup Method1: EPH-04-1
Cleanup Date1: 12/23/08

Parameter	Result	Qualifier	Units	RDL
Extractable Petroleum Hydrocarbons for sample(s): 01 Batch: WG348030-1				
C9-C18 Aliphatics	ND		mg/kg	6.67
C19-C36 Aliphatics	ND		mg/kg	6.67
C11-C22 Aromatics	ND		mg/kg	6.67
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.67
Naphthalene	ND		mg/kg	0.333
2-Methylnaphthalene	ND		mg/kg	0.333
Acenaphthylene	ND		mg/kg	0.333
Acenaphthene	ND		mg/kg	0.333
Fluorene	ND		mg/kg	0.333
Phenanthrene	ND		mg/kg	0.333
Anthracene	ND		mg/kg	0.333
Fluoranthene	ND		mg/kg	0.333
Pyrene	ND		mg/kg	0.333
Benzo(a)anthracene	ND		mg/kg	0.333
Chrysene	ND		mg/kg	0.333
Benzo(b)fluoranthene	ND		mg/kg	0.333
Benzo(k)fluoranthene	ND		mg/kg	0.333
Benzo(a)pyrene	ND		mg/kg	0.333
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.333
Dibenzo(a,h)anthracene	ND		mg/kg	0.333
Benzo(ghi)perylene	ND		mg/kg	0.333

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	44		40-140
o-Terphenyl	52		40-140
2-Fluorobiphenyl	70		40-140
2-Bromonaphthalene	69		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Extractable Petroleum Hydrocarbons Associated sample(s): 02-10 Batch: WG347747-2 WG347747-3					
C9-C18 Aliphatics	70	60	40-140	15	25
C19-C36 Aliphatics	69	69	40-140	0	25
C11-C22 Aromatics	70	81	40-140	15	25
Naphthalene	67	62	40-140	8	25
2-Methylnaphthalene	68	68	40-140	0	25
Acenaphthylene	65	68	40-140	5	25
Acenaphthene	68	72	40-140	6	25
Fluorene	64	73	40-140	13	25
Phenanthrene	67	77	40-140	14	25
Anthracene	73	83	40-140	13	25
Fluoranthene	67	80	40-140	18	25
Pyrene	72	83	40-140	14	25
Benzo(a)anthracene	66	81	40-140	20	25
Chrysene	67	83	40-140	21	25
Benzo(b)fluoranthene	67	84	40-140	23	25
Benzo(k)fluoranthene	68	84	40-140	21	25
Benzo(a)pyrene	67	82	40-140	20	25
Indeno(1,2,3-cd)Pyrene	66	82	40-140	22	25
Dibenzo(a,h)anthracene	66	82	40-140	22	25
Benzo(ghi)perylene	67	82	40-140	20	25
Nonane (C9)	59	41	30-140	**36**	25

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Extractable Petroleum Hydrocarbons Associated sample(s): 02-10 Batch: WG347747-2 WG347747-3					
Decane (C10)	68	52	40-140	27	25
Dodecane (C12)	73	62	40-140	16	25
Tetradecane (C14)	73	66	40-140	10	25
Hexadecane (C16)	73	68	40-140	7	25
Octadecane (C18)	72	69	40-140	4	25
Nonadecane (C19)	72	70	40-140	3	25
Eicosane (C20)	71	70	40-140	1	25
Docosane (C22)	71	71	40-140	0	25
Tetracosane (C24)	70	70	40-140	0	25
Hexacosane (C26)	73	73	40-140	0	25
Octacosane (C28)	71	71	40-140	0	25
Triacontane (C30)	72	73	40-140	1	25
Hexatriacontane (C36)	78	78	40-140	0	25

Surrogate	LCS %Recovery	Qualifier	LCSD %Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	64		62		40-140
o-Terphenyl	72		89		40-140
2-Fluorobiphenyl	68		76		40-140
2-Bromonaphthalene	74		79		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Extractable Petroleum Hydrocarbons Associated sample(s): 01 Batch: WG348030-2 WG348030-3					
C9-C18 Aliphatics	44	52	40-140	17	25
C19-C36 Aliphatics	59	63	40-140	7	25
C11-C22 Aromatics	62	74	40-140	18	25
Naphthalene	44	58	40-140	**27**	25
2-Methylnaphthalene	46	61	40-140	**28**	25
Acenaphthylene	46	58	40-140	23	25
Acenaphthene	50	62	40-140	21	25
Fluorene	54	64	40-140	17	25
Phenanthrene	60	69	40-140	14	25
Anthracene	67	77	40-140	14	25
Fluoranthene	63	73	40-140	15	25
Pyrene	67	76	40-140	13	25
Benzo(a)anthracene	64	74	40-140	14	25
Chrysene	67	76	40-140	13	25
Benzo(b)fluoranthene	66	75	40-140	13	25
Benzo(k)fluoranthene	68	78	40-140	14	25
Benzo(a)pyrene	65	73	40-140	12	25
Indeno(1,2,3-cd)Pyrene	65	74	40-140	13	25
Dibenzo(a,h)anthracene	65	74	40-140	13	25
Benzo(ghi)perylene	68	77	40-140	12	25
Nonane (C9)	32	44	30-140	**32**	25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Extractable Petroleum Hydrocarbons Associated sample(s): 01 Batch: WG348030-2 WG348030-3					
Decane (C10)	36	49	40-140	31	25
Dodecane (C12)	40	53	40-140	28	25
Tetradecane (C14)	45	55	40-140	20	25
Hexadecane (C16)	53	59	40-140	11	25
Octadecane (C18)	57	61	40-140	7	25
Nonadecane (C19)	59	62	40-140	5	25
Eicosane (C20)	58	62	40-140	7	25
Docosane (C22)	59	63	40-140	7	25
Tetracosane (C24)	60	64	40-140	6	25
Hexacosane (C26)	62	67	40-140	8	25
Octacosane (C28)	61	65	40-140	6	25
Triacontane (C30)	64	67	40-140	5	25
Hexatriacontane (C36)	72	74	40-140	3	25

Surrogate	LCS %Recovery	Qualifier	LCSD %Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	52		47		40-140
o-Terphenyl	67		80		40-140
2-Fluorobiphenyl	62		70		40-140
2-Bromonaphthalene	69		72		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

Fractionation Check Standard Quality Control

Fractionation check standard for 200818205

Parameter	% Recovery	QC Criteria
C9-C18 Aliphatics	77	40-140
C19-C36 Aliphatics	76	40-140
C11-C22 Aromatics	86	40-140
Naphthalene	82	40-140
2-Methylnaphthalene	78	40-140
Acenaphthylene	76	40-140
Acenaphthene	80	40-140
Fluorene	79	40-140
Phenanthrene	78	40-140
Anthracene	82	40-140
Fluoranthene	84	40-140
Pyrene	84	40-140
Benzo(a)anthracene	82	40-140
Chrysene	88	40-140
Benzo(b)fluoranthene	81	40-140
Benzo(k)fluoranthene	97	40-140
Benzo(a)pyrene	78	40-140
Indeno(1,2,3-cd)Pyrene	76	40-140
Dibenzo(a,h)anthracene	83	40-140
Benzo(g,h,i)perylene	82	40-140
Nonane	72	30-140
Decane	77	40-140
Dodecane	80	40-140
Tetradecane	76	40-140
Hexadecane	78	40-140
Octadecane	76	40-140
Nonadecane	75	40-140
Eicosane	77	40-140
Docosane	79	40-140
Tetracosane	83	40-140
Hexacosane	78	40-140
Octacosane	77	40-140
Triacontane	76	40-140
Hexatriacontane	75	40-140
% Naphthalene Breakthrough	0	0-5
% 2-Methylnaphthalene Breakthrough	0	0-5

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Fractionation Check Standard Quality Control

Fractionation check standard for 200818205

Surrogate	% Recovery	QC Criteria
Chloro-Octadecane	66	40-140
o-Terphenyl	83	40-140
2-Fluorobiphenyl	75	40-140
2-Bromonaphthalene	76	40-140

METALS

roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

ab ID: L0818553-01 Date Collected: 12/15/08 11:00

:lient ID: SS-1 Date Received: 12/17/08

:ample Location: CHARLTON, MA Field Prep: Not Specified

latrix: Soil

'ercent Solids: 79%

arameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
otal Metals by MCP 6000/7000 series										
rsenic, Total	7.4		mg/kg	0.58	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
arium, Total	72		mg/kg	0.58	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
admium, Total	ND		mg/kg	0.58	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
hromium, Total	19		mg/kg	0.58	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
ead, Total	170		mg/kg	2.9	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
lercury, Total	0.19		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:16	EPA 7471A	64,7471A	DM
elenium, Total	ND		mg/kg	2.9	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
ilver, Total	ND		mg/kg	0.58	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG

roject Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
roject Number:	75398-67217	**Report Date:**	12/24/08

SAMPLE RESULTS

ab ID:	L0818553-02	Date Collected:	12/15/08 11:02
lient ID:	SS-2	Date Received:	12/17/08
ample Location:	CHARLTON, MA	Field Prep:	Not Specified
atrix:	Soil		
ercent Solids:	78%		

arameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
otal Metals by MCP 6000/7000 series										
senic, Total	5.4		mg/kg	0.62	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
arium, Total	74		mg/kg	0.62	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
admium, Total	ND		mg/kg	0.62	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
romium, Total	20		mg/kg	0.62	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
ad, Total	160		mg/kg	3.1	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
ercury, Total	0.20		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:18	EPA 7471A	64,7471A	DM
lenium, Total	ND		mg/kg	3.1	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
lver, Total	ND		mg/kg	0.62	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD

roject Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
roject Number:	75398-67217	**Report Date:**	12/24/08

SAMPLE RESULTS

ab ID:	L0818553-03	Date Collected:	12/15/08 11:04
lient ID:	SS-3	Date Received:	12/17/08
ample Location:	CHARLTON, MA	Field Prep:	Not Specified
atrix:	Soil		
ercent Solids:	84%		

arameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
otal Metals by MCP 6000/7000 series										
senic, Total	5.5		mg/kg	0.55	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
arium, Total	46		mg/kg	0.55	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
admium, Total	ND		mg/kg	0.55	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
romium, Total	15		mg/kg	0.55	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
ad, Total	92		mg/kg	2.7	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
ercury, Total	0.65		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:19	EPA 7471A	64,7471A	DM
elenium, Total	ND		mg/kg	2.7	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
lver, Total	ND		mg/kg	0.55	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD

roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

ab ID: L0818553-04 Date Collected: 12/15/08 11:06

lient ID: SS-4 Date Received: 12/17/08

ample Location: CHARLTON, MA Field Prep: Not Specified

latrix: Soil

ercent Solids: 84%

arameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
otal Metals by MCP 6000/7000 series										
rsenic, Total	5.7		mg/kg	0.59	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
arium, Total	53		mg/kg	0.59	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
admium, Total	ND		mg/kg	0.59	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
hromium, Total	16		mg/kg	0.59	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
ead, Total	110		mg/kg	2.9	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
ercury, Total	0.54		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:21	EPA 7471A	64,7471A	DM
elenium, Total	ND		mg/kg	2.9	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
ilver, Total	ND		mg/kg	0.59	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD

roject Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
roject Number:	75398-67217	**Report Date:**	12/24/08

SAMPLE RESULTS

ab ID:	L0818553-05	Date Collected:	12/15/08 11:08
lient ID:	SS-5	Date Received:	12/17/08
ample Location:	CHARLTON, MA	Field Prep:	Not Specified
latrix:	Soil		
ercent Solids:	80%		

arameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
otal Metals by MCP 6000/7000 series										
rsenic, Total	4.8		mg/kg	0.60	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
arium, Total	80		mg/kg	0.60	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
admium, Total	ND		mg/kg	0.60	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
hromium, Total	20		mg/kg	0.60	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
ead, Total	200		mg/kg	3.0	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
ercury, Total	0.11		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:29	EPA 7471A	64,7471A	DM
elenium, Total	ND		mg/kg	3.0	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
ilver, Total	ND		mg/kg	0.60	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD

roject Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
roject Number:	75398-67217	**Report Date:**	12/24/08

SAMPLE RESULTS

ab ID:	L0818553-06	Date Collected:	12/15/08 11:10
lient ID:	SS-6	Date Received:	12/17/08
ample Location:	CHARLTON, MA	Field Prep:	Not Specified
latrix:	Soil		
ercent Solids:	83%		

arameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
otal Metals by MCP 6000/7000 series										
rsenic, Total	7.2		mg/kg	0.58	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
arium, Total	230		mg/kg	0.58	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
admium, Total	ND		mg/kg	0.58	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
hromium, Total	19		mg/kg	0.58	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
ead, Total	280		mg/kg	2.9	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
lercury, Total	0.70		mg/kg	0.09	1	12/19/08 18:00	12/22/08 13:30	EPA 7471A	64,7471A	DM
elenium, Total	ND		mg/kg	2.9	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
ilver, Total	ND		mg/kg	0.58	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD

roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

ab ID: L0818553-07 Date Collected: 12/15/08 11:12

lient ID: SS-7 Date Received: 12/17/08

ample Location: CHARLTON, MA Field Prep: Not Specified

latrix: Soil

ercent Solids: 84%

arameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
otal Metals by MCP 6000/7000 series										
senic, Total	6.4		mg/kg	0.57	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
arium, Total	53		mg/kg	0.57	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
admium, Total	ND		mg/kg	0.57	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
hromium, Total	21		mg/kg	0.57	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
ead, Total	98		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
ercury, Total	0.53		mg/kg	0.09	1	12/19/08 18:00	12/22/08 13:32	EPA 7471A	64,7471A	DM
elenium, Total	ND		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
lver, Total	ND		mg/kg	0.57	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD

roject Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
roject Number:	75398-67217	**Report Date:**	12/24/08

SAMPLE RESULTS

ab ID:	L0818553-08	Date Collected:	12/15/08 11:14
lient ID:	SS-8	Date Received:	12/17/08
ample Location:	CHARLTON, MA	Field Prep:	Not Specified
latrix:	Soil		
ercent Solids:	85%		

arameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
otal Metals by MCP 6000/7000 series										
rsenic, Total	7.2		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
arium, Total	68		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
admium, Total	ND		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
hromium, Total	17		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
ead, Total	140		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
ercury, Total	0.84		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:34	EPA 7471A	64,7471A	DM
elenium, Total	ND		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
ilver, Total	ND		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD

roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

ab ID: L0818553-09 Date Collected: 12/15/08 11:16

lient ID: SS-9 Date Received: 12/17/08

ample Location: CHARLTON, MA Field Prep: Not Specified

latrix: Soil

ercent Solids: 83%

arameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
otal Metals by MCP 6000/7000 series										
senic, Total	3.5		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
arium, Total	35		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
admium, Total	ND		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
hromium, Total	11		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
ead, Total	38		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
ercury, Total	0.19		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:36	EPA 7471A	64,7471A	DM
elenium, Total	ND		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
ilver, Total	ND		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD

roject Name: CHARLTON LANDFILL **Lab Number:** L0818553

roject Number: 75398-67217 **Report Date:** 12/24/08

SAMPLE RESULTS

ab ID: L0818553-10 Date Collected: 12/15/08 11:18

lient ID: SS-10 Date Received: 12/17/08

ample Location: CHARLTON, MA Field Prep: Not Specified

latrix: Soil

ercent Solids: 82%

arameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
otal Metals by MCP 6000/7000 series										
rsenic, Total	7.3		mg/kg	0.59	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
arium, Total	54		mg/kg	0.59	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
admium, Total	ND		mg/kg	0.59	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
hromium, Total	21		mg/kg	0.59	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
ead, Total	100		mg/kg	3.0	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
ercury, Total	ND		mg/kg	0.09	1	12/19/08 18:00	12/22/08 13:37	EPA 7471A	64,7471A	DM
elenium, Total	ND		mg/kg	3.0	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
ilver, Total	ND		mg/kg	0.59	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 12/24/08

Method Blank Analysis
Batch Quality Control

rameter	Result Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
tal Metals by MCP 6000/7000 series for sample(s): 02-10 Batch: WG347690-1								
enic, Total	ND	mg/kg	0.50	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
ium, Total	ND	mg/kg	0.50	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
dmium, Total	ND	mg/kg	0.50	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
romium, Total	0.83	mg/kg	0.50	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
ad, Total	ND	mg/kg	2.5	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
lenium, Total	ND	mg/kg	2.5	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
ver, Total	ND	mg/kg	0.50	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD

Prep Information

Digestion Method: EPA 3050B

rameter	Result Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
tal Metals by MCP 6000/7000 series for sample(s): 01 Batch: WG347873-1								
enic, Total	ND	mg/kg	0.50	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
rium, Total	ND	mg/kg	0.50	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
dmium, Total	ND	mg/kg	0.50	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
romium, Total	ND	mg/kg	0.50	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
ad, Total	ND	mg/kg	2.5	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
lenium, Total	ND	mg/kg	2.5	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
ver, Total	ND	mg/kg	0.50	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG

Prep Information

Digestion Method: EPA 3050B

rameter	Result Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
tal Metals by MCP 6000/7000 series for sample(s): 01-10 Batch: WG347882-1								
rcury, Total	ND	mg/kg	0.08	1	12/19/08 18:00	12/22/08 12:53	64,7471A	DM

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Method Blank Analysis
Batch Quality Control

Prep Information

Digestion Method: EPA 7471A

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals by MCP 6000/7000 series Associated sample(s): 02-10 Batch: WG347690-2 WG347690-3					
Arsenic, Total	100	99	75-125	1	30
Barium, Total	94	93	75-125	1	30
Cadmium, Total	103	98	75-125	5	30
Chromium, Total	101	97	75-125	4	30
Lead, Total	99	94	75-125	5	30
Selenium, Total	97	94	75-125	3	30
Silver, Total	102	98	75-125	4	30
Total Metals by MCP 6000/7000 series Associated sample(s): 01 Batch: WG347873-2 WG347873-3					
Arsenic, Total	100	102	75-125	2	30
Barium, Total	99	98	75-125	1	30
Cadmium, Total	103	104	75-125	1	30
Chromium, Total	102	102	75-125	0	30
Lead, Total	99	100	75-125	1	30
Selenium, Total	98	98	75-125	0	30
Silver, Total	98	102	75-125	4	30
Total Metals by MCP 6000/7000 series Associated sample(s): 01-10 Batch: WG347882-2 WG347882-3					
Mercury, Total	99	97	75-125	2	30

INORGANICS
&
MISCELLANEOUS

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-01
Client ID: SS-1
Sample Location: CHARLTON, MA
Matrix: Soil

Date Collected: 12/15/08 11:00
Date Received: 12/17/08
Field Prep: Not Specified

ameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
neral Chemistry									
ds, Total	79		%	0.10	1	-	12/21/08 14:35	30,2540G	NM

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-02
Client ID: SS-2
Sample Location: CHARLTON, MA
Matrix: Soil

Date Collected: 12/15/08 11:02
Date Received: 12/17/08
Field Prep: Not Specified

ımeter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
eral Chemistry									
s, Total	78		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-03
Client ID: SS-3
Sample Location: CHARLTON, MA
Matrix: Soil

Date Collected: 12/15/08 11:04
Date Received: 12/17/08
Field Prep: Not Specified

ameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
eral Chemistry									
s, Total	84		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-04
Client ID: SS-4
Sample Location: CHARLTON, MA
Matrix: Soil

Date Collected: 12/15/08 11:06
Date Received: 12/17/08
Field Prep: Not Specified

ameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
ıeral Chemistry									
ls, Total	84		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-05
Client ID: SS-5
Sample Location: CHARLTON, MA
Matrix: Soil

Date Collected: 12/15/08 11:08
Date Received: 12/17/08
Field Prep: Not Specified

ameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
ıeral Chemistry									
ls, Total	80		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-06
Client ID: SS-6
Sample Location: CHARLTON, MA
Matrix: Soil

Date Collected: 12/15/08 11:10
Date Received: 12/17/08
Field Prep: Not Specified

ıameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
ıeral Chemistry									
s, Total	83		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-07
Client ID: SS-7
Sample Location: CHARLTON, MA
Matrix: Soil

Date Collected: 12/15/08 11:12
Date Received: 12/17/08
Field Prep: Not Specified

meter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
eral Chemistry									
s, Total	84		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-08
Client ID: SS-8
Sample Location: CHARLTON, MA
Matrix: Soil

Date Collected: 12/15/08 11:14
Date Received: 12/17/08
Field Prep: Not Specified

ımeter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
ıeral Chemistry									
s, Total	85		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-09
Client ID: SS-9
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:16
Date Received: 12/17/08
Field Prep: Not Specified

ımeter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
eral Chemistry									
s, Total	83		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

SAMPLE RESULTS

Lab ID: L0818553-10
Client ID: SS-10
Sample Location: CHARLTON, MA
Matrix: Soil

Date Collected: 12/15/08 11:18
Date Received: 12/17/08
Field Prep: Not Specified

ımeter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
ıeral Chemistry									
s, Total	82		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Lab Duplicate Analysis
Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Associated sample(s): 02-10 QC Batch ID: WG347822-1 QC Sample: L0818443-03 Client ID: DUP Sample					
Solids, Total	70	72	%	3	20
Associated sample(s): 01 QC Batch ID: WG347935-1 QC Sample: L0818480-02 Client ID: DUP Sample					
Solids, Total	80	82	%	2	20

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0818553-01A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-02A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-03A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-04A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-05A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-06A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)

*Hold days indicated by values in parentheses

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 12/24/08

Container Information

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0818553-07A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-08A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-09A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-10A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)

*Hold days indicated by values in parentheses

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	12/24/08

GLOSSARY

Acronyms

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NI - Not Ignitable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

ND - Not detected at the reported detection limit for the sample.

RDL - Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

J - Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Standard Qualifiers

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

Report Format: Data Usability Report

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	12/24/08

REFERENCES

30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

60 Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). May 2004.

61 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH). Massachusetts Department of Environmental Protection, DEA/ORS/BWSC. May 2004, Revision 1.1.

64 Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). August 2004.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

[redacted]
Eight Walkup Drive Westborough, MA 01581
TEL: 508-898-9220 FAX: 508-898-9193

Client Information

Client: CDM
Address: 50 Hampshire street
Cambridge, MA 02139
Phone: 617-452-6659
Fax: 617-452-6659
Email: RECCHIAVM@CDM.COM
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Charlton Landfill
Project Location: Charlton, MA
Project #: 75398-67217
Project Manager: Vincent Recchia
ALPHA Quote #: 2008645

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: 12/24 Time:

Other Project Specific Requirements/Comments/Detection Limits:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MCP PRESUMPTIVE CERTAINTY - THESE QUESTIONS MUST BE ANSWERED

☐ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Are Drinking Water Samples Submitted?
☐ Yes ☐ No Have you met minimum field QC requirements?

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ANALYSIS: RCRA 8 Metals	EPH w/PAHs (Delute)	TOTAL # BOTTLES	Sample Specific Comments
85513 1	SS-1	12/15/08	11:00	Soil	BK	X	X		
2	SS-2		11:02			X	X		
3	SS-3		11:04			X	X		
4	SS-4		11:06			X	X		
5	SS-5		11:08			X	X		
6	SS-6		11:10			X	X		
7	SS-7		11:12			X	X		
8	SS-8		11:14			X	X		
9	SS-9		11:16			X	X		
10	SS-10		11:18			X	X		
	Container Type					A	G		
	Preservative					A	A		

QUESTIONS ABOVE MUST BE ANSWERED FOR PRESUMPTIVE CERTAINTY

IS YOUR PROJECT MCP ?

Relinquished By:	Date/Time	Received By:	Date/Time
Saint Kelly	12/17/08 11:32	[redacted]	12/17/08 15:11
[redacted]	12/17/08 17:25		12/17 17:21

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.

FORM NO: 01-01

12240814:02

One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: 617 452-6000
fax: 617 452-8000

September 26, 2009

Ms. D. Lynne Welsh
Acting Solid Waste Section Chief
Massachusetts Department of Environmental Protection- Central Region
627 Main Street
Worcester, MA 01608

Subject: Response to Unilateral Administrative Order (UAO-CE-09-4005) – Item 21E
Flint Road Landfill, Charlton
FML Installation Quality Assurance/Quality Control Information

Dear Ms. Welsh:

On behalf of the Town of Charlton (Town), Camp Dresser & McKee, Inc (CDM) is responding to the Unilateral Administrative Order (UAO) dated August 27, 2009 issued by the Massachusetts Department of Environmental Protection (MassDEP) regarding the Flint Street Landfill (the Landfill) in Charlton, Massachusetts. Section IV-Disposition and Order of the UAO required the Town to complete several action items. Action Item 21(E) requires the submission of quality assurance/quality control information and testing data within 30 days of receipt of this order (on or before September 26, 2009) that demonstrates the flexible membrane liner component of the landfill cap was completed appropriately. This submittal is the response to Action Item 21(E).

As previously summarized in CDM's September 3, 2009 correspondence, the existing FML liner appears to be installed in accordance with standard industry practices. The Town continues to seek all the quality assurance/quality control (QA/QC) information for the HDPE material and installation from the installer. All available QA/QC information for the FML installation was gathered and is presented herein.

FML Installation Information

On September 14th and 15th, CDM collected all available installation QA/QC information via a detailed inspection of the existing liner. Information was compiled from visual inspection and documentation of all visible information written on the FML by the installer. Information collected included panel layout, non-destructive seam testing information (air testing and vacuum box testing), destructive testing locations and repair locations.

HDPE panel information collected includes the panel numbers, date deployed, panel length or shape, and HDPE roll numbers. Some panels located on the landfill's south-east corner did not have assigned numbers; numbers were assigned to these panels by CDM (U-1 through U-17). Information is incomplete for panels P-1 through P-5 and P-9 through P-15 as these panels are underneath the stockpile of soils located on the flat plateau of the landfill area. Additionally, as two different types of HDPE FML were used, the type of texture was noted for each panel. The panel layout plan is being finalized and will be submitted under separate cover (as Attachment A). The Panel Placement Forms are included as Attachment B.

Panel seam information collected included the date, welding machine number, initials of the person who welded the seam, seam length, and if there was a destructive sample taken from the seam. The panel seaming forms are included in Attachment C.

Non-Destructive Testing information collected included the test date, the seam segment being tested and whether the seam passed or failed. For the double track fusion weld air testing, the beginning and ending pressure and test time were also recorded. Most of the seams were tested with passing results, however seams and repair patches located along panel P-123 on the plateau area and repair patches for destruct samples DS-15 and DS-50 did not appear to have been tested. The Non-Destructive Test Data forms are included as Attachment D.

Destructive sample locations are identified on the Panel Layout Plan, and summarized on the Destructive Testing Log included as Attachment E. Based upon the information collected, 54 destructive samples were taken. Based upon the total length of seams measured and the typical destructive sampling frequency of 1 test per 500 linear feet of seam, an adequate quantity of destructive samples was collected.

Without installation oversight and record installation information from the installer, CDM cannot certify that the FML installation was completed to industry standards. However, aside from the few remaining air tests and repairs, it is our opinion that the HDPE FML was installed appropriately and in general conformance with standard installation practices and MassDEP regulations.

We are available to meet with your office regarding the information presented herein. Please do not hesitate to contact me at (617) 452-6541, if you have any questions or require anything further.

Very truly yours,

Bruce W. Haskell

Bruce W. Haskell, P.E.
Camp Dresser & McKee Inc.

Attachments

cc: Board of Health, Charlton
Robin Craver, Town of Charlton
Jim Philbrook, Town of Charlton
Chris Koehler, CDM
Laura Bugay, CDM

Attachment A

Panel Layout Plan

(to be submitted separately)

Attachment B

Panel Placement Forms

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Placement Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data (9/14/2009)

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	PANEL NUMBER	ROLL NUMBER	PANEL LENGTH (FT)	PANEL WIDTH (FT)	TX or MS	Comments
N/A	P-1	PANELS (MS) LOCATED UNDERNEATH STOCKPILE LOCATED ON THE TOP OF THE LANDFILL.				
N/A	P-2					
N/A	P-3					
N/A	P-4					
N/A	P-5					
12/?/2008	P-6	315232	72.5 (average)	22	MS	TRAPEZOIDAL PIECE
N/A	P-7	315232	39 (average)	22	MS	TRAPEZOIDAL PIECE
N/A	P-8	N/A	27.5 (average)	22	MS	TRAPEZOIDAL PIECE
N/A	P-9	PANELS (MS) LOCATED UNDERNEATH STOCKPILE LDCATED ON THE TOP OF THE LANDFILL.				
N/A	P-10					
N/A	P-11					
N/A	P-12					
N/A	P-13					
N/A	P-14					
N/A	P-15					
12/4/2008	P-16	315344	134	22	MS	
12/4/2008	P-17	315340	108	22	MS	
12/4/2008	P-18	315340	242	22	MS	
12/3/2008	P-19	315340	232	22	MS	
12/3/2008	P-20	315116	229	22	MS	
12/3/2008	P-21	315116	222	22	MS	
12/3/2008	P-22	315227	222	22	MS	
12/3/2008	P-23	315227	222	22	MS	
N/A	P-24	N/A	77	22	MS	
N/A	P-25	N/A	140	22	MS	ROCK UNDER PANEL @88'FROM TOP OF SEAM; 1' WEST OF P23/P25 SEAM
2008	P-26	315236	162	22	MS	PANEL INSTALLED UPSIDE DOWN
12/9/2008	P-27	315236	202	22	MS	PANEL INSTALLED UPSIDE DOWN
12/9/2008	P-28	315115	98	22	MS	
12/9/2008	P-29	315236	97	22	MS	
12/9/2008	P-30	315115	182	22	MS	
12/9/2008	P-31	315230	181	22	MS	
12/9/2008	P-32	315146	54	22	MS	
12/9/2008	P-33	315230	121	22	MS	
12/9/2008	P-34	315246	52	22	MS	
2/10/2009	P-35	315346	195	22	MS	
N/A	P-36	315346	105	22	MS	
N/A	P-37	315101-08	203	22	MS	PANEL INSTALLED UPSIDE DOWN
N/A	P-38	315101-08	183	22	MS	
N/A	P-39	315101-08	183	22	MS	
N/A	P-40	315101-08	183	22	MS	
N/A	P-41	315237-08	82	22	MS	
N/A	P-42	315237-08	179	22	MS	
N/A	P-43	315237-08	179	22	MS	
N/A	P-44	315233-08	176	22	MS	
N/A	P-45	315233-08	118.5	22	MS	
N/A	P-46	315231-08	53	22	MS	
N/A	P-47	315229-08	85	22	MS	
N/A	P-48	315229-08	58	22	MS	
N/A	P-49	N/A	14.5 (average)	12	MS	
N/A	P-50	315233-08	64	22	MS	

NOTES:
N/A: INFORMATION NOT AVAILABLE FROM QA/QC COLLECTION.

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Placement Form

Project: Flint Road Landfill, Chariton Ma
Collection of liner installation data (9/14/2009)

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	PANEL NUMBER	ROLL NUMBER	PANEL LENGTH (FT)	PANEL WIDTH (FT)	TX or MS	Comments
N/A	P-51	315233-08	43	22	MS	
N/A	P-52	N/A	35 (average)	22	MS	TRAPEZOIDAL PIECE
N/A	P-53	N/A	23	22	MS	TRIANGLE PIECE
N/A	P-54	315229-08	138	22	MS	MUDDY TIRE TRACKS ON SLOPE
N/A	P-55	315229-08	136	22	MS	MUDDY TIRE TRACKS ON SLOPE
N/A	P-56	315229-08	132	22	MS	
N/A	P-57	315237-08	121	22	MS	
N/A	P-58	N/A	10.5	22	MS	
N/A	P-59	315233-08	18.5 (average)	22	MS	TRAPEZOIDAL PIECE
N/A	P-60	N/A	8.5 (average)	5.5	MS	TRIANGLE PIECE
	P-61					
	P-62					
	P-63					
	P-64					
	P-65					
	P-66					
	P-67					
	P-68					
	P-69					
	P-70					
	P-71					
	P-72					
	P-73					
	P-74					
	P-75					
	P-76					
	P-77					
	P-78	See Other Pages				
	P-79					
	P-80					
	P-81					
	P-82					
	P-83					
	P-84					
	P-85					
	P-86					
	P-87					
	P-88					
	P-89					
	P-90					
	P-91					
	P-92					
	P-93					
	P-94					
	P-95					
N/A	P-96	N/A	39	22	MS	
N/A	P-97	N/A	24.5 (average)	22	MS	TRIANGLE PIECE
N/A	P-98	N/A	34.5 (average)	22	MS	TRIANGLE PIECE
	P-99	See Other Pages				
	P-100					

NOTES:
N/A: INFORMATION NOT AVAILABLE FROM QA/QC COLLECTION.

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Placement Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	PANEL NUMBER	ROLL NUMBER	PANEL LENGTH (FT)	PANEL WIDTH (FT)	TX or MS	Comments
N/A	U-1	5035	116	21	TX	
N/A	U-2	75037/5035	219	22	TX	2 ROLL #'S WRITTEN ON PANEL
N/A	U-3	5035	123	22	TX	
N/A	U-4	5035	118	22	TX	
N/A	U-5	75035	112	22	TX	
N/A	U-6	75035	6	22.5	TX	
N/A	U-7	75031	83	22	TX	
N/A	U-8	75031	34	21.5	TX	
16-Mar	U-9	1-75031	66	24	TX	DS-54 TRIANGLE
16-Mar	U-10	N/A	SEE COMMENTS		TX	TRIANGLE (26X31X30)
16-Mar	U-11	N/A	SEE COMMENTS		TX	TRIANGLE (42X27X26)
16-Mar	U-12	75031	SEE COMMENTS		TX	QUADRANGLE (82*30*39*31)
16-Mar	U-13	75031	101	22.5	TX	
16-Mar	U-14	75031	105.5	21	TX	
13-Mar	P-128	1-75034	233	22	TX	TEAR IN BOTTOM LEFT CORNER OF LINER
13-Mar	P-127	1-75034	244.5	21.5	TX	
13-Mar	P-126	1-75034	247	22	TX	
N/A	U-15	N/A	162	21.5	TX	ROLL NOT LABELED
16-Feb	P-61	315231-08	230	22.5	MS	
16-Feb	P-62	315231-08	277	22.5	MS	
16-Feb	P-64	315223-08	134	22.5	MS	
16-Feb	P-63	315231-08	100	23	MS	
16-Feb	P-65	315223-08	230	23	MS	
16-Feb	P-66	315223-08	234	23	MS	BIG EROSION GULLY IN SUBGRADE DOWN CENTER OF PANEL
16-Feb	P-67	315202-08	239	23	MS	
16-Feb	P-68	315202	240	23	MS	
16-Feb	P-69	315202	110	22	MS	
16-Feb	P-70	315235-08	120	22.5	MS	EROSION GULLY IN SUBGRADE DOWN CENTER
16-Feb	P-71	315235-08	242	22.5	MS	
17-Feb	P-72	315235-08	194	23	MS	
17-Feb	P-73	315118-08	62	23	MS	
N/A	P-122	N/A	169	21.5	TX	NO ROLL NUMBER
17-Feb	P-74	315118-08	283	22	MS	
17-Feb	P-75	31-5118-08	189	22	MS	
17-Feb	P-76	315220-08	119	22.5	MS	
17-Feb	P-77	315220-08	237	23	MS	
17-Feb	P-78	215220-08	136	23	MS	RIP AT BOTTOM
17-Feb	P-79	315222-08	197	23	MS	
17-Feb	P-81	315222-08	94	23	MS	
17-Feb	P-80	315222-08	239	23	MS	
17-Feb	P-82	315224-08	320.5	22	MS	
17-Feb	P-84	315545-08	60.5	22.5	MS	
17-Feb	P-83	315224-08	252.5	23	MS	
17-Feb	P-85	315345-08	298	22.5	MS	
7-Mar	P-119	315117	95.5	22..5	MS	
N/A	P-99	N/A	334	23	MS	
N/A	P-102	N/A	309	22.5	MS	TRIANGLE PIECE
N/A	P-104	N/A	322.5	21	TX	
N/A	P-103	N/A	146.5	19	TX	TRIANGLE PIECE
N/A	P-105	N/A	114	23	TX	

NOTES:
N/A=INFORMATION NOT AVAILABLE FROM QA/QC

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Placement Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	PANEL NUMBER	ROLL NUMBER	PANEL LENGTH (FT)	PANEL WIDTH (FT)	TX or MS	Comments
6-Mar	P-106	175033	193	22	TX	
6-Mar	P-108	175033	150	22	TX	
N/A	P-107	N/A	147.5	22	TX	
6-Mar	U-16	175027	16	22	TX	
6-Mar	P-109	1-75033	243.5	22	TX	TRIANGLE PIECE
7-Mar	P-110	1-75027	169	22.5	TX	
7-Mar	P-111	1-75027	41	22.5	TX	
7-Mar	P-113	1-75027	33	21.5	TX	TRIANGLE PIECE
7-Mar	P-112	1-75027	151	21.5	TX	
7-Mar	P-114	1-75027	124	23	TX	TEAR IN BOTTOM LEFT OF LINER
7-Mar	P-115	1-75027	31	18.5	TX	TRIANGLE PIECE
7-Mar	P-116	1-75027	75	24	TX	TEAR IN BOTTOM RIGHT SIDE OF LINER; LARGE ROCKS UNDER
N/A	P-117	N/A	61	24.5	TX	TRIANGLE PIECE
6-Mar	P-118	N/A	24	21	TX	TRIANGLE PIECE
N/A	P-101A	1-75033	25	19.5	TX	TRIANGLE PIECE
N/A	P-101	N/A	268	23	MS	
N/A	P-100	N/A	247	22.5	MS	
N/A	P-86	N/A	161	22	MS	
N/A	P-87	N/A	159	24	MS	
N/A	P-93	N/A	17	24	MS	
N/A	P-89	N/A	80.5	24	MS	
N/A	P-90	N/A	34	24	MS	
N/A	P-91	N/A	78	24.5	MS	TRIANGLE PIECE
N/A	P-88	N/A	132	23	MS	

NOTES:
N/A=INFORMATION NOT AVAILABLE FROM QA/QC

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Placement Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data (9/14/2009)

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	PANEL NUMBER	ROLL NUMBER	PANEL LENGTH (FT)	PANEL WIDTH (FT)	TX or MS	Comments
N/A	U-17	N/A	158	22	TX	

NOTES:
N/A: INFORMATION NOT AVAILABLE FROM QA/QC COLLECTION.

Attachment C

Panel Seaming Forms

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Seaming Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America) B=upside down

DATE	SEAM NUMBER	SEAMERS INITIALS	MACHINE NO.	SEAM LENGTH	DESTRUCT NO. & LOCATION	Comments
3 16 2009	p-57/u-1	TUI	20	89.5		well to ground
3 16 2009	p-57/u-1	TUI	20	24	top to well	
3 16 2009	u-1/u-3	TUI	20	124	ent + u-1,u-2,u-3 VTOK # 92	
3 16 2009	u-1/u-2	TUI	20	22		
3 16 2009	u-2/u-3	TUI	20	22		
3 16 2009	u-3/u-4	TUI	20	122	94-32' from top	kink 77' from top
3 16 2009	u-4/u-5	TUI	20	113	@ 113 (intersection)	
3 16 2009	u-4/u-6	TUI	20	3	@ 0' #96	
3 16 2009	u-5/u-6	TUI	20	21	@ 0 & 2 98,96	
3 16 2009	u-5/u-6	TUI	20	24	@ 24 # 99	
3 16 2009	u-5/u-7	TUI	20	84	@ 0	
3 16 2009	u-7/u-9	MT	20	63	@ 63-105	
3 16 2009	u-9/u-12	MT	20	29	@ 10' from top #106	
3 16 2009	u-9/u-10	TUI	20	31	@ 0- 107	
3 16 2009	u-10/u-11	MT	20	27	@ 0-107	
3 16 2009	u-11/u-12	MT	20	40	@ top - 107	
3 16 2009	u-12/u-13	MT	20	83.5	@ top - 165	bend 8' from top
3 16 2009	u-12/u-7		20	9	@ 9' -104	
3 16 2009	u-13/u-8		20	13	@ 0' - 104	extrusion in center
3 16 2009	u-8/u-14	TUI	20	22	@ 22 - 100	
3 16 2009	u-8/u-2	TUI	20	22	@ 0 - 100	
3 16 2009	u-6/u-2		20	22	@22-95	
3 16 2009	u-2/u-4		20	22	@ 22 - 93	
3 16 2009	u-8/u-8		20	7	@ 0-85	
3 16 2009	u-2/u-14	TUI	20	108.5	@ top - 100	
3 16 2009	u-2/p-128	TUI	20	224	@ 166 from Btm -112	
3 13 2009	p-127/p-128	TUI	20	234	@ top	
3 13 2009	p-127/p-126		20	240	@ 204 from bottom, sta 111	
3 13 2009	p-126/u-15		20	22	@ 22- 141 (3/16)	
3 13 2009	p-126/p-61		20	217	@ 78.5 from top - 110	(RIP in liner)
	p-126/p-61		20	217	@ 131 from top (108)	
2 16 2009	p-61/p-62	TUI	20	220.5	@ top - 139	
3 12 2009	p-62/u-15		2	22	@ top 138, 139	
2 16 2009	p-62/p-64	TC		129	@ btm -143	
2 16 2009	p-64/p-63	TC	2	22	@ top Right 143	
2 16 2009	p-63/p-62	TC	2	93	@ top - 143	extrusion center @ btm
2 16 2009	p-63/p-65	TC	2	97	@ top 149	
2 16 2009	68/64	TUI	20	128		65' from Bottom - 147
3 12 2009	65/ u-15			22	@ ends	
2 16 2009	65/66	TC	2	229.5	49' from top	OTT #6 - B
2 16 2009	66/67	TUI	20	228	220' from bottom - 149	OTT # 6
3 12 2009	76/ u-15			22	ends (134, 125)	
2 16 2009	67/68	TUI	20	23	63.5 from top	OTT #6 TC -
2 16 2009	68/69			153	101.5, 153 OTT # 6	
2 16 2009	69/70	TC	2	22	top 153, 154	
2 16 2009	70/68	TUI	20	122	91' from bottom	OTT # 6 , TC
2 16 2009	70/71		2	121.5	90' from top	OTT # 6 TC DS - 32
3 10 2009	70/102	TUI	20	22	-49 - 6' from R	#162
2 16 2009	69/71			110	# 154 @ top	OTT #6

Total seam length this page: 4088

Total seam length previous page(s): 0

Total Cumulative Seam Length (carry over to next page): 4088

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Seaming Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America) B=upside down

DATE	SEAM NUMBER	SEAMERS INITIALS	MACHINE NO.	SEAM LENGTH	DESTRUCT NO. & LOCATION	Comments
2 17 2009	71/72	MT		186	182 from bottom	OTT # 6 (184, 185)
2 17 2009	73/72	TC	2	22	# 189 @ right side	
2 17 2009	71/73	TUI	20	81.5	44' From bottom	DS - 33 (157)
3 12 2009	73/122			22	# (227) C end	
2 17 2009	73/74	TC	2	62	DS- 34 27' from top (3/8)	
2 17 2009	74/72			210		
2 17 2009	74/75	MT		180	104' from bottom, OTT # 6, 160 @ top	
2 17 2009	75/76	TUI	20	22		
2 17 2009	74/76	TUI	20	118	65' from bottom OTT # 159	
2 17 2009	122/76			22	# 274 @ left side	
2 17 2009	76/77	TC	2	116.5	26.5' from top DS - 35	
2 17 2009	77/75	TC	2	200	38.5' from top OTT # 6	
2 17 2009	77/78	TUI	20	133	@ top OTT # 6	
2 17 2009	79/76	TUI	20	22	right side # 165 (2/16 or 2/17)	
2 12 2009	79/77	TUI	20	196	bottom	
3 12 2009	79/122			20	left side -254	
2 17 2009	79/81	TC	2	98	8' from topp (3/16) DS - 36	
2 17 2009	81/80			22	right side	
2 17 2009	80/79	TC	2	94.5	64.5' from top	
2 17 2009	80/78	TC	2	140	top	
2 12 2009	80/82			240	@ top # 169	
2 12 2009	81/82			88	@ bottom	
3 10 2009	119/82			25	@ right side	
2 17 2009	82/84	TC	2	64.5	34.5' from top DS 37 3/16	
2 17 2009	84/83	TC	2	22	left side OTT # 6 (174)	
2 17 2009	82/83	TC	2	247	# 173 @ top	
2 17 2009	83/85	TUI	20	249	# 174 @ top	
2 17 2009	85/84	TUI	20	53	30' from bottom DS - 38 (3-16)	
2009	85/119			25	right side	
2009	99/119			22	left side	
2 27	85/99	TUI	20	292	74' from top (#178)	
2 27 2009	99/102	TUI	20	318.5	271 from bottom # 176 AS - 39	
2 27 2009	104/102	TUI	20	189		
2 27 2009	103/102	TUI	20	150	top	
2 27 2009	103/104	TUI	20	150	top	
2 27 2009	105/104	TUI	20	119	28' from bottom DS - 40	
3 6 2009	105/106	TUI	20	22	left side - # 189	
2 27 2009	106/104	TUI	20	195	top - 242	
	106/108			152	8' from top	
	108/107			22		# 187
	108/107			29	@ top	
	105/107			119	@ top	extrusion for 110'
3 12 2009	u-16/107			16	@ top	
3 12 2009	u-16/109			22	top right	
3 12 2009	u-16/110			10	@ top	

Total seam length this page: 4770.5

Total seam length previous page(s): 4068

Total Cumulative Seam Length (carry over to next page): 8838.5

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Seaming Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America) B=upside down

DATE	SEAM NUMBER	SEAMERS INITIALS	MACHINE NO.	SEAM LENGTH	DESTRUCT NO. & LOCATION	Comments
	110/109			157	@ top # 199	
	110/111			22	@ right # 199	
	109/111			58.5	46' from bottom (3-12) DS - 43	
	111/101			38	@ top # 323	
	111/113			27		
3 10 2009	110/113	MT		5.5	@ top	
3 10 2009	112/113			22	@ right # 199	
	112/110			161	@ top # 201	
	112/114			160		holes in seam @ 83' bottom rock seam
	114/101			38	@ top # 212	
	114/115			31	DS -44 @ 7' (3-12) # 204	
	115/116			22	@ right # 206	
	114/116			77	@ top (#205)	
	117/116			71	@ top (#206)	(3/12)
	111/117			40	@ top (#206)	
	118/117			31	@ top # 207	(NO VTOK)
	118/101			29	@ top # 207	(NO VTOK)
	101/115			39	@ top # 203	
	101/100			246	@ 56' from bottom	DS-45 (206) 3/12 MT
	100/30			24	@ bottom	
	100/31			25	@ top # 227	
	100/86			155.5	@ top # 225	
2 13 2009	86/87	TUI	20	156.5	137 ' from bottom	DS - 46 OTT #6
2 13 2009	87/92	TUI	20	32	@ top # 210	OTT # 6 (2/24)
	87/93	TUI	20	20	@ top 209	
	93/92	TUI	20	23	@ top 207	
2 18 2009	92/91	TUI	20	54	@ top 210	
2 18 2009	91/87	TUI	20	34	@ top 212	
2 18 2009	90/87	TUI	20	34	@ 4' from bottom # 212 OTT # 6	
2 18 2009	88/90	TUI	20	34	top # 216	OTT # 6 (2/24)
2 19 2009	90/89	TC	10	22	@ left # 273	
2 18 2009	88/89	TUI	20	78	@ top # 213	
2 18 2009	88/87	TUI	20	39	@ top # 222	OTT # 6
	101/101A			20	@ left # 236	
	101A/108			24	@ bottom # 233	
	108/109			117.5	@ 1' from top	DS - 42
	107/109			145	@ top # 181	
					@ 92.5 from top # 198	
					@ 126 from top # 190	
2009						
2009						
2009						

Total seam length this page: 2302.5

Total seam length previous page(s): 8858.5

Total Cumulative Seam Length (carry over to next page): 11161

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Seaming Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data 8/4/09

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SEAM NUMBER	SEAMERS INITIALS	MACHINE NO.	SEAM LENGTH	DESTRUCT NO. & LOCATION	Comments
NA	P21 / P120	N/A	N/A	116'		
NA	P21 / P22	N/A	N/A	222'	DS-11 @ 58-63' from TOP	to AT; erosion of subgrade at bottom
12/3/08 130p	P22 / P23	OTT	104	222'	DS-12 @ 170'-175' from bottom TOS	
12/3/08 2:41p	P23 / P24	OTT	104	77'	DS-13 @ 57'-102' from TOP	
12/3/08 2:41p	P23 / P25	OTT	104	140'	+ AT	Rock on P-25 @ 88'; 1' off seam to west
12/3/08 2:16p	P24 / P25	OTT	104	22'		X-seam
NA	P25 / P126	NA	NA	141		
12/9/08 10:44	P24 / P126	TUI	11	104	DS-14 30'-32' from P24/P25 X-seam	
12/9/08 930	P-26 / P27	TC	162	202'	DS-15 55-60 from TOP	Repair @ 89' from TOP
NA	P-27 / P29	NA	NA	97'		
NA	P-27 / P28	NA	NA	98'	DS-16 63-68' from X. seam 28/29	
12/9/08 10:00	P-28 / P-29	TC	162	22'		X-seam
12/9/08 1140	P-28 / P30	TC	162	92'	DS-17 53'-59' from TOP	
12/9/08 1140	P-29 / P30	TC	162	99'		to AT
12/9/08 1230	P30 / P31	TC	162	181	DS-18 127' to 132' from TOS	
12/9/08 1:50p	P31 / P32	TUI	11	54	DS-19 32'-38' from TOP	
	P31 / P33	NA	NA	121		
12/9/08 125p	P32 / P33	TUI	11	22		X seam
	P35 / P33	NA	NA	80'		AT ended edge of Known
12/9/08 230p	P33 / P34	TUI	11	41'		
N/A	P32 / P34	NA	NA	52'	DS-20 19'-23' from 32/33 X-seam	
NA	P34 / P810	NA	NA	21'		
NA	P34 / P89	NA	NA	21		
2/18 11:00	P34 / P87	TUI	20	22		
2/18 11:00	P34 / P94	NA	NA	22		
2/18 341p	P34 / 95	TUI	20	161		Repair 5' up from P34/P35
2/18 341	P35 / P95	TUI	20	110'		
NA	P35 / P97	NA	NA	29'		
NA	P35 / P98	NA	NA	31'	waste exposed - flap?	@ 20-31' of TOS - Needs Patch need to flap to corr west
NA	P98 / P96	NA	NA	38		
NA	P97 / P96	NA	NA	191		
2/19	P96 / P95	TC	10	39'		X-Seam
NA	P94 / P95	NA	NA	102		
2/18/09 1150	P94 / P88	TUI	20	128	DS-47 @ 117 to 122' from TOS	
4:00 2/20/09	P48 / P59	TC	02	41'		tosed. AT OK
NA	P47 / P59	NA	NA	32		
NA	P20 / P121	NA	NA	23		
NA	P19 / P121			22		
NA	P18 / P123			23		
NA	P16 / P123			26		
NA	PG15 / P123			30		
NA	PG14 / P123			30		
	PG13 / P123			30'		
	PG11 / U-17			20.5		
	PG12 / U-17			28		
NA	P123 / U-17	NA	NA	10'		
NA	P123 / U15	NA	NA	8'		
NA	P122 / U-15	NA	NA	10'		
NA	P122 / P68	NA	NA	7.5'		
NA	P123 / P122	NA	NA	171'		Extrusion weld VTOK
NA	P121 / P123	NA	NA	11	DS-48 91'-to 96' from U15/U17	R: 209 to 257

Total seam length this page: 3062

Total seam length previous page(s): + 0

Total Cumulative Seam Length (carry over to next page): 3062

174to180

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Seaming Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation date

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SEAM NUMBER	SEAMERS INITIALS	MACHINE NO.	SEAM LENGTH	DESTRUCT NO. & LOCATION	Comments
2/10/09 2:00	P157/P58	TC	02	121		
2/10/09 2:17	P56/P55	TJ1	20	137		
2/10/09	P56/P58	TC	02	10.5		
2:40pm "	P55/P54	TC	02	138	DS-25 9-14' from R-81 (P-45/P-54/P-55)	Top of slope
2/10/09 420	P54/P53	TC	02	23		
2/10/09 420	P54/P52	TC	02	28		
2/10/09 420	P54/P51	TC	02	28'		
4:20 2/10/09	P54/P50	TC	02	28'		
4:20 2/10/09	P54/P47	TC	02	21'		
NA	P45/P55	NA	NA	12'		
2/10/09	P45/P54	TJ1	20	23'		
5:10 2/10/09	P45/P47	TC	02	84'		to sediment / TOS
2/10/09 3:15	P47/P60	TC	02	6'		entire seam needs repair * Panels not joined
2/10/09 3:30	P59/P60	TC	02	7'		
2/10/09 3:15	P59/P47	TC	02	32'		
2/10/09 3:15	P47/P48	TC	02	@ 116.5		
2/10/09 3:15	P47/P49	TC	02	17'		
2/10/09 4:10	P49/P50	TC	02	13'		
2/10/09 350	P48/P49	TC	02	12'		X Seam
2/10/09 4:10	P48/P50	TC	02	58'		
2/10/09 3:25	P50/P51	TJ1	20	58'	DS-26 55' from bottom	3' from P54/P50/P51 ; intersects R-79
2/10/09 345	P51/P52	TJ1	20	43'		
2/10/09 400	P52/P53	TJ1	20	72		
NA	P46/P58	NA	NA	20.5'		
NA	P46/P56	NA	NA	22.5'		
NA	P55/P45	NA	NA	11		
2/10/09 4:17	P46/P45	TJ1	20	22		X-seam
NA	P44/P45	NA	NA	127.5		
NA	P44/P46	NA	NA	49		
2/10/09 4:24p	P44/P43	TJ1	20	177'	DS-23 162-166' from top	
2/10/09 1:40p	P43/P42	TJ1	20	179'		16' in anchor trench based upon marks on liner to sed anch OK
2/10/09 11:30a	P42/P41	TJ1	20	82'	DS-22 55'-59' from top	
2/10/09 11:15a	P41/P40	TC	02	22'		X-seam
2/10/09 11:30a	P40/P42	TJ1	20	87'		to sed anch OK
2/10/09 11:30	P40/P39	TC	02	95'		
2/10/09 1130	P41/P39	TC	02	79		
2/10/09 10:49	P39/P38	TJ1	20	83	DS-21 74'-79' from top (plan)	to sed anch OK .9' in anchor based upon station/dir
2/10/09 1030	P38/P36	TC	02	105		6' in anchor BUS ; to sed anch OK
2/10/09 1010	P36/P37	TC	02	22'		X seam
2/10/09 10:30	P37/P38	TC	02	84'		
2/10/09 10:10	P37/P35	TJ1	20	82'		7:30/8
2/10/09 10:10	P36/P35	TJ1	20	113		to sed liner bunched at TOS
NA	P35/P0 Repair	NA	NA	199'		extrusion weld entire length ; Repair mac patch
12/4/08 8:40a	P116/P18	TJ1	11	134	DS-8 13'-18' from top	8:00/7
12/4/08 9:05	P116/P17	TJ1	11	22'		X-Seam (straight)
NA	P18/P17	TJ1	11	108'		to AT ; AT OK needs backfill
NA	P18/P19	NA	NA	235'		
NA	P17/P8	NA	NA	23'		
NA	P19/P20	NA	NA	232	DS-9 159-165' from TOS	to AT
12/3/08 2:07	P20/P21	TJ1	11	229	DS-10 174-180 from TOS	to AT 8:00/7
NA	P21/P121	NA	NA	7'		
NA	P59/P48	NA	NA	30'		

Total seam length this page: 3714.5

Total seam length previous page(s): + 3062

Total Cumulative Seam Length (carry over to next page): 6776.5

TOP - Top of Seam
TOS - Toe of Slope
BUS - Based upon station

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Seaming Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation date 8/15/09

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SEAM NUMBER	SEAMERS INITIALS	MACHINE NO.	SEAM LENGTH	DESTRUCT NO. & LOCATION	Comments
NA	P121 | P122	NA	NA	3.5'		from R254 to R256
NA	P122 | P119	NA	NA	23'		R255 from 11 to 12' from P119 | P121
NA	P121 | P119	NA	NA	55'		
NA	P121 | P120	NA	NA	22'		X-Seam
NA	P120 | P119	NA	NA	31'		
NA	P120 | P99	NA	NA	10'		
NA	P119 | P99	NA	NA	24'		
NA	P99 | P23	NA	NA	12'		Extrusion Weld
NA	P104 | P23	NA	NA	6.5'		Extrusion Weld
NA	P20 | P121	NA	NA	7'		Extrusion Weld
NA	P120 | P21	NA	NA	16'		
NA	P22 | P120	NA	NA	10'		
10:42 3/12	U17 | P35	TUI	20	20'		
	U17 | P37			22'		
	U17 | P38			22'		
	U17 | P39			22		
	U17 | P41			22		
	U17 | P42			19'		
NA	U17 | P42	NA	NA	10'		From R121 to R-120
3/12 9:45a	U15 | U17	TUI	20	158	DS-50 from 19-24' from	P42

Total seam length this page: 489.5

Total seam length previous page(s): + 10776.5

Total Cumulative Seam Length (carry over to next page): 72666

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Panel Seaming Form

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SEAM NUMBER	SEAMERS INITIALS	MACHINE NO.	SEAM LENGTH	DESTRUCT NO. & LOCATION	Comments
12/4/08 3:00p	PG11/PG12	TJM	11	NA		Under Soil Stockpile - Grossed panel #'s
NA	PG12/PG13	NA	NA	NA	DS-4	↓
12/4/08 1:03p	PG13/PG14	TJM	11	NA	DS-5	
NA	PG14/PG15	NA	NA	NA	DS-6	
NA	PG15/PG16	NA	NA	135'		
NA	PG15/PG17	NA	NA	108'		

Total seam length this page: 243

Total seam length previous page(s): + 72266

Total Cumulative Seam Length (carry over to next page): 7509

Attachment D

Non-Destructive Test Data

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Non-Destructive Test Data

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SEAM SEGMENT	TESTERS INITIALS	DOUBLE TRACK FUSION WELDS					EXTRUSION WELDS	Comments
			PRESSURE (PSI)		TEST TIME				
			START	END	START	END	PASS/FAIL	V-BOX (P/F)	
3 16 2009	57/#u-1	TUI	31	30	12:51	12:56	ok		
3 16 2009	u1/u-2		30	30	12:55	1:00	ok		
3 16 2009	57/u-1	TUI	31	30	12:51	12:56	ok		
3 16 2009	u-1/u-3	TUI	30	29	12:55	1:00	ok		
3 16 2009	u-1/u-2	TUI	30	30	12:55	1:00	ok		
3 16 2009	u-2/u-3	TUI	30	30	12:55	1:00	ok		
3 16 2009	u-3/u-4	TUI	30	30	1:01	1:06	ok		
3 16 2009	u-u/u-5	TUI	30	30	1:10	1:15	ok		
3 16 2009	u-u/u-6	TUI	30	30	1:06	1:11	ok		
3 16 2009	u-5/u-6	TUI	30	30	1:10	1:15	ok		
3 16 2009	u-5/u-8	TUI	30	30	1:15	1:20	ok		
3 16 2009	u-5/u-7	TUI	30	30	2:06	2:11	ok		
3 16 2009	u-7/u-9	MT	30	29	2:00	2:05	ok		
3 16 2009	u-9/u-12	MT	30	30	2:00	2:05	ok		
3 16 2009	u-9/u-10	TUI	30	30	2:30	2:35	ok		
3 16 2009	u-10/u-11		30	30	2:30	2:35	ok		
3 16 2009	u-11/3-12		30	30	2:30	2:35	ok		
3 16 2009	u-12/u-13	MT	30	30	2:00	2:05	ok		
3 16 2009	u-12/u-7		30	30	1:45	1:50	ok		
3 16 2009	u-13/u-8		30	30	1:40	1:45	ok		
3 16 2009	u-18/u-14		30	30	1:30	1:35	ok		
3 16 2009	u-8/u-2		30	30	1:30	1:35	ok		
3 16 2009	u-6/u-2		30	30	1:06	1:11	ok		
3 16 2009	u-2/u-4		30	30	1:01	1:06	ok		
3 16 2009	u-6/u-8		30	30	1:15	1:20	ok		
3 16 2009	u-2/u-14	TUI	30	30	1:30	1:35	ok		
3 16 2009	u-2/p-128	TUI	30	30	12:45	12:50	ok		
3 13 2009	p-1 27-p-128		30	30	1:30	1:35	ok		
3 13 2009	p-1 27-p-126		30	29	11:00	11:05	ok		
3 13 2009	p-126/u-15		30	30	12:50	12:00	ok		
3 13 2009	p-126/p-61		30	30	1:00	1:05	ok		
3 13 2009	p-126/p-61		30	30	1:15	1:20	ok		
3 13 2009	p-126/p-61		30	30	1:22	1:27	ok		
2 16 2009	p-61/p-62	TUI	30	29	9:50	9:55	ok		
3 12 2009	p-62/u-15		30	30	12:55	1:00	ok		
2 16 2009	p-62/p-60	TC	30	30	9:56	10:01	ok		
2 16 2009	p-64/p-63	TC	30	30	10:10	10:16	ok		
2 16 2009	p-63/p-62	TC	30	30	10:11	10:16	ok		
2 16 2009	63/65	TC	30	30	10:30	10:35	ok		
2 16 2009	65/64	TUI	30	30	10:30	10:35	ok		
3 12 2009	65/u-15		30	30	12:50	12:55	ok		
2 16 2009	65/66								N/A
2 16 2009	66/67		30	30	11:11	11:16	ok		
3 12 2009	67/u-15		30	30	11:05	11:10	ok		
2 16 2009	67/68		30	30	1:30	1:35	ok		N/A
2 16 2009	69/70		30	30	1:30	1:35	ok		
	70/68								N/A
3 12 2009	70/102		30	30	8:10	8:15	ok		
2 16 2009	70/71	TC	30	28	1:16	1:21	ok		

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) u52-6000

Non-Destructive Test Data

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SEAM SEGMENT	TESTERS INITIALS	DOUBLE TRACK FUSION WELDS					EXTRUSION WELDS	Comments
			PRESSURE (PSI)		TEST TIME			V-BOX	
			START	END	START	END	PASS/FAIL	(P/F)	
2 17 2009	75/76		30	30	10:33	10:38	ok		
2 17 2009	74/76	MT							N/A
3 12 2009	120/76		30	30	8:50	8:55	ok		
2 17 2009			30	N/A	10:53	10:58	ok		
2 17 2009	75/77		30	28	10:50	10:55	ok		
2 17 2009	77/78	MT	30	30	2:50	2:55	ok		
2 17 2009	79/78	MT	30	30	1:00	1:05	ok		
2 17 2009	77/79	MT	30	30	12:50	12:55	ok		
3 12 2009	79/122		30	30	9:00	9:05	ok		
2 17 2009	79/81	MT	30	30	1:20	1:25	ok		
	81/80	MT	30	30	1:35	1:40	ok		
2 17 2009	80/79		30	30	2:01	2:06	ok		
2 17 2009	80/78	MT	30	29	1:00	1:05			
2 17 2009	80/82		30	30	2:20	2:25	ok		
	81/82		30	30	1:42	1:47	ok		
	82/119		30	29	8:00	8:05	ok		
2 17 2009	82/84	MT	30	30	2:50	2:55	ok		
2 17 2009	84/83	MT	30	30	3:31	3:36	ok		
2 17 2009	82/83	MT	30	28	2:50	2:55	ok		
2 17 2009	85/83	MT	30	28	3:30	3:35	ok		
2 17 2009	85/84	MT	30	29	3:25	3:30	ok		
3 10 2009	85/119	MT	30	30	8:06	8:11	ok		
3 10 2009	97/119	MT	30	30	8:13	8:18	ok		
2 27 2009	85/99	MT	30	29	12:55	1:00	ok		
	85/99	MT	30	30	12:55	1:00	ok		
	85/99	MT	30	28	3:00	3:05	ok		
2 27 2009	99/102	MT	30	29	3:30	3:35	ok		
	104/102		30	30	3:20	3:25	ok		
	103/102		30	30	3:06	3:11	ok		
	103/104	MT	30	29	3:06	3:11	ok		
3 12 2009	105/106	MT	30	30	2:42	2:47	ok		
	106/104		30	28	1:00	1:05	ok		
3 11 2009	106/108		30	28	2:01	2:06	ok		
3 10 2009	108/107	MT	30	29	3:00	3:05	ok		
	106/107		30	30	2:50	2:55	ok		
3 12 2009	107/105							40'	N/A
3 12 2009	u-16/107		30	30	3:44	3:49			
3 12 2009	u-16/109		30	30	3:44	3:49			
3 12 2009	u-16/110		30	30	9:25	9:30			
3 10 2009	110/109	MT	32	30	9:20	9:25	ok		
3 10 2009	110/111	MT	30	30	9:20	9:25	ok		
3 10 2009	109/111	MT	31	30	9:10	9:15	ok		
3 10 2009	111/101	MT	30	30	9:10	9:15	ok		
3 10 2009	111/113	MT							N/A
3 10 2009	110/113	MT						5'	N/A
3 10 2009	113/112	MT	30	30	9:35	9:40	ok		
3 10 2009	112/110	MT	31	30	9:35	9:40	ok		
3 12 2009	112/114	MT	30	28	9:50	9:55	ok		
3 10 2009	114/101		30	330	9:50	9:55	ok		
3 10 2009	114/115		30	30	10:50	10:55	ok		

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) u52-6000

Non-Destructive Test Data

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SEAM SEGMENT	TESTERS INITIALS	DOUBLE TRACK FUSION WELDS					EXTRUSION WELDS	Comments
			PRESSURE (PSI)		TEST TIME			V-BOX	
			START	END	START	END	PASS/FAIL	(P/F)	
3 10 2009	115/116		30	30	11:00	11:05	ok		
3 10 2009	114/116	MT	31	30	11:00	11:05	ok		
3 12 2009	117/116		30	29	11:07	11:12	ok		
	101/117		30	30	11:07	11:12	ok		
	118/117		30	30	11:35	11:40	ok		
	118/101		30	30	11:35	11:40	ok		
3 10 2009	101/115		30	30	10:50	10:55	ok		
	101/100		30	29	4:15	4:20	ok		
3 10 2009	100/30		31	30	8:53	8:58	ok		
3 10 2009	100/31	MT	30	29	8:53	8:57	ok		
3 10 2009	100/86	MT	30	30	9:06	9:11	ok		
2 23 2009	86/87	MT	30	29	7:30	7:35	ok		
2 24 2009	87/92	MT	30	30	8:07	8:12	ok		
2 24 2009	87/99		30	30	8:13	8:18	ok		
2 24 2009	93/92		30	30	8:13	8:18	ok		
2 24 2009	92/91	MT	30	30	8:07	8:12	ok		
2 24 2009	91/93		30	30	8:02	8:07	ok		
2 24 2009	90/87		30	29	8:25	8:30	ok		
2 24 2009	88/90	MT	30	30	7:50	7:55	ok		
2 24 2009	90/89	MT	30	30	7:56	8:01	ok		
2 24 2009	88/89		30	30	7:56	8:01	ok		
2 24 2009	87/88		30	30	7:36	7:41	ok		
3 5 2009	101/101A	MT	31	30	2:31	2:36	ok		
3 10 2009	101A/108		30	28	2:20	2:28	ok		
	108/109		30	28	2:20	2:28	ok		
3 10 2009	107/109		30	29	2:58	3:03	ok		
3 12 2009	107/109		30	29	3:32	3:37	ok		
3 12 2009	107/105		30	30	3:44	3:49	ok		

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Non-Destructive Test Data

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SEAM SEGMENT	TESTERS INITIALS	DOUBLE TRACK FUSION WELDS					EXTRUSION WELDS	Comments
			PRESSURE (PSI)		TEST TIME				
			START	END	START	END	PASS/FAIL	V-BOX (P/F)	
2/11/09	P56/P57	SV?	715	720	30	29	P		
2/11/09	P56/P58	SV?	710	715	30	30	P		
2/11/09	P58/P57	SV	715	720	30	30	P		
2/11/09	P56/P56	SV	710	715	30	30	P		
2/11/09	P56/P55	SV	725	730	30	30	P		
2/11/09	P46/P55	NA	775	730	30	30	P		
NA	P46/P45	NA	732	737	30	29	P		X seam
NA	P45/P55	NA	732	737	30	30	P		
NA	P54/P55	NA	740	745	30	29	P		
2/11/09	P54/P55	OTT	-	-	-	-	-	P	DS-25
NA	P45/P54	NA	740	745	30	29	P		
NA	P45/P47	NA	750	755	30	30	P		
NA	P54/P47	NA	746	751	30	30	P		
NA	P49/P47	NA	746	756	30	30	P		
NA	P49/P50	NA	746	751	30	30	P		
NA	P47/P48	NA	830	835	30	30	P		
NA	P47/P59	NA	830	835	30	30	P		15' from . R70-R71 (40p 1/2 of seam)
NA	P47/P59	NA	835	840	30	30	P		15' from . R-71 to R-69 (60ft w/ 1/2)
NA	P47/P60	NA	855	900	30	30	P		(Repair at end)
NA	P59/P60	NA	855	900	covered	covered	?		pressure under R-109
NA	P48/P59	NA	830	835	30	30	P		
NA	P50/P48	NA	822	827	30	30	P		
NA	P54/P50	NA	800	805	30	30	P		
NA	P54/P51	NA	800	805	30	30	P		
NA	P50/P51	NA	820	825	30	29	P		
2/11/09	P54/P52	NA	810	815	30	29	P		
NA	P51/P52	NA	810	815	30	30	P		
NA	P52/P53	NA	811	816	30	30	P		
NA	P53/P54	NA	811	816	30	30	P		
NA	P44/P46	NA	901	906	30	29	P		
NA	P44/P45	NA	9:01	9:06	30	28	P		
NA	P44/P43	NA	911	916	30	30	P		(50' to end)
NA	P44/P43	NA	911	916	30	29	P		from R65 to R66 PS23 ~75'
NA	P43/P42	NA	1015	1020	30	28	P		
NA	P42/P41	NA	925	930	30	30	P		
NA	P42/P40	NA	925	930	30	29	P		
NA	P40/P41	NA	925	930	30	30	P		X seam
NA	P40/P39	NA	945	950	30	30	P		R-62 1 East (50' of seam)
NA	P40/P39	NA	940	945	30	29	P		from R-61 to R-62 (~30')
NA	P39/P38	NA	940	945	30	28	P		
NA	P38/P36	NA	covered	covered	30	29	P		Times covered by R-125
NA	P36/P37	NA	1000	1005	30	30	P		from R-58 - East to TOS (110')
NA	P38/P37	NA	1005	1010	30	30	P		
NA	P38/P37	NA	955	1000	30	30	P		
NA	P37/P35	NA	955	1000	30	30	P		TOP 5' to V-2 (R-59)
NA	P36/P35	NA	1005	1010	30	NO INFO	?		
2/11/09	P35/P?G2	MT	1005	1010	30	30	P		
NA	PG3/PG4	NA	-	-	-	-	-	P	Entire Seam Extruded R-56
NA	PG3/PG4	NA	215	220	30	29	P		From R1N1 to TOS
NA	PG5/P6	NA	215	220	30	29	P		From R3 to AJ ~10'
			225	230	30	29	P		

NA- Not available - Not Indicated on liner

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Non-Destructive Test Data

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data 9/15/09

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SEAM SEGMENT	TESTERS INITIALS	DOUBLE TRACK FUSION WELDS					EXTRUSION WELDS	Comments
			PRESSURE (PSI)		TEST TIME				
			START	END	START	END	PASS/FAIL	V-BOX (P/F)	
NA	P16/PG11	NA	30	29	2:25	230	P	–	
NA	PG7/PG11	NA	30	30	230	235	P		
NA	P16/PG7	NA	30	28	230	235	P		
NA	PG11/P8	NA	30	30	250	255	P		
NA	PG7/P8	NA	30	30	250	255	P		
NA	P16/PG15	NA	30	29	1140	1145	P		
NA	PG15/P17	NA	30	29	1140	1145	P		
NA	P16/P17	NA	30	30	1130	1135	P		X Seam - East 15' of seam
NA	P16/P17	NA	30	28	1130	1135	P		X seam - West 6' of seam
NA	P17/P18	NA	30	Covered	1130	1135	?		PSI covered by R-21 patch
NA	P16/P18	NA	30	30	1130	1135	P		From R22 to TOS-AT (100' from AT)
NA	P18/P19	NA	30	29	1120	1125	P		
NA	P18/P19	NA	NA	NA	NA	NA	NA		NO info found
NA	P19/P20	NA	NA	NA	NA	NA	NA		NO info found
NA	P20/P21	NA	NA	NA	NA	NA	NA		NO info found
3/10/09	P20/P121	NA	30	30	837	842	P		
NA	P19/P121	NA	30	30	845	850	P		
3/12/09	P18/P123	NA	30	30	935	940	P		
3/12/09	P16/P123	NA	30	30	935	940	P		
3/12/09	PG15/P123	NA	30	30	945	950	P		
NA	PG15/PG14	NA	30	30	100	105	P		
3/12/09	P123/PG14	NA	30	29	955	1000	P		
NA	PG14/PG13	NA	NA	NA	NA	NA	NA		No info
3/12/09	P123/PG13	NA	30	30	955	10:00	P		
3/12/09	P123/PG12	NA	30	29	1010	1015	P		
3/12/09	U-17/PG11	NA	30	30	120	125	P		
NA	P123/U-17	NA	30	30	210	215	P		
3/12/09	P123/U-15	NA	30	30	210	215	P		
3/12/09	P122/U-15	NA	30	30	225	230	P		
NA	P122/P-68	NA	–	–	–	–	–	P	
NA	P122/P123	NA	30	30	920	925	P		128' from U15 to R268
NA	P122/P123	NA	30	30	913	918	P		R268 to R257 (end of seam 191')
NA	P121/P123	NA	30	30	913	918	P		
NA	P121/P122	NA	NA	NA	NA	NA	–	P	Fusion - but VBox'd - 3.5'
NA	P119/P122	NA	30	30	906	911	P		1st 10' from R256 to R255
NA	P119/P122	NA	30	30	9:00	9:05	P		13' from R255 to R254
3/10	P119/P121	NA	30	30	831	836	P		
NA	P120/P121	NA	30	30	831	836	P		
3/10	P119/P120	NA	30	30	813	818	P		
3/10	P119/P99	NA	30	30	813	818	P		
NA	P120/P99	NA	31	30	819	824	P		
3/6/09	P99/P23	[illegible]	–	–	–	–	P	P	3 AT
NA	P21/P22	NA	NA	NA	NA	NA	NA		weld cut at bottom for AT no info found
3/10/09	P21/P121	NA	30	30	837	842	P		
3/10/09	P120/P21	NA	32	31	825	830	P		
3/10/09	P22/P120	NA	30	30	825	830	P		
NA	P22/P23	KP/BC	30	28	1055	11:00	P		From R-23 down 70'
NA	P23/P25	NA	30	30	1030	1035	P		From R-27 down (10)
NA	P23/P25	NA	30	28	1025	1030	P		from R-26 to R-27
NA	P23/P25	KP/BC	30	29	1015	1020	P		from P23/P24/P25 (R-25) to R-26
NA	P24/P25	KP/BC	29	29	10:15	1020	P		X Seam

CDM

U17/U15 138 M-24 P98/P35 P123 top puncture near bork

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Non-Destructive Test Data

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SEAM SEGMENT	TESTERS INITIALS	DOUBLE TRACK FUSION WELDS					EXTRUSION WELDS	Comments
			PRESSURE (PSI)		TEST TIME				
			START	END	START	END	PASS/FAIL	V-BOX (P/F)	
NA	P23 | P24	KP&GC	29	29	9:55	10:00	P	-	From R-24 to R-260 (X-Seam)
NA	P23 | P24	KP&GC	30	30	9:55	10:00	P		From R-24 to TOP (6')
Covered	P24 | P26	← covered	———	→	9:20	← covered	—		R-241 patch covering time & result
NA	P25 | P26	NA	30	28	110	115	P		
Covered	P27 | P28	←	covered	→	936	941	?		Covered by R-29 patch
NA	P27 | P29	NA	30	29	936	941	P		
NA	P28 | P29	NA	30	30	936	941	P		
NA	P28 | P30	NA	30	28	945	950	P		
NA	P29 | P30	NA	30	29	945	950	P		
NA	P30 | P31	NA	30	30	1000	1005	P		TOP to R-32
NA	P30 | P31	NA	30	28	1000	1005	P		R-32 to R-
NA	P31 | P33	NA	30	29	1009	1012	P		
NA	P31 | P32	NA	30	30	1007	1012	P		
NA	P32 | P33	NA	30	30	1007	1012	P		X Seam
NA	P32 | P34	NA	30	29	1016	1021	P		
NA	P33 | P34	NA	30	30	1015	1020	P		
NA	P33 | P35	NA	30	29	1015	1020	P		
NA	P34 | P35	NA	30	30	1015	1020	P		X-Seam
NA	P98 | P35	NA	30	29	913	918	P		
NA	P98 | P96	NA	30	30	913	918	P		
"	P96 | P97	"	30	30	906	911	P		
"	P35 | P97	"	30	28	900	905	P		
"	P97 | P95	"	30	30	851	856	P		
"	P95 | P96	"	30	30	906	911	P		
"	P35 | P95	"	30	29	851	856	P		
"	P34 | P95	"	30	30	840	845	P		
"	P95 | P94	"	30	30	840	845	P		
"	P34 | P94	"	30	30	742	747	P		
"	P94 | P86	"	30	30	742	747	P		
"	P34 | P87	"	30	30	736	740	P		
"	P88 | P87	"	30	30	736	941	P		
2/12	U17 | P35 N	NA	30	30	125	130	P		From P35/L9 Patch to R-128 (5')
3/12	U17 | P35	NA	30	30	120	125	P		
3/12	U17 | P37	NA	30	30	115	120	P		
3/12	U17 | P38	NA	30	29	110	115	P		
3/12	U17 | P39	NA	30	30	110	115	P		
3/12	U17 | P41	NA	30	29	1110	115	P		
3/12	U17 | P42	NA	30	30	105	110	P		From R123(P42/P41/U17) to R-122 (6
3/12	U17 | P42	NA	30	30	155	200	P		From R 121 - R-120
3/12	U17 | U15	NA	30	30	1105	1110	P		

Attachment E

Destructive Testing Log

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Destructive Test Log

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SAMPLE ID#	SEAM NUMBER	MACHINE NUMBER	SEAMERS INITIALS	TEST MODE	FIELD TEST RESULTS IN LBS/IN SAMPLE NUMBER 1	2	3	4	5	PASS/FAIL
N/A	DS-1	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-2	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-3	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-4	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-5	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-6	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-7	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-8	P16/P18	11	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-9	P19/P20	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-10	P20/P21	11	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-11	P21/P22	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-12	P22/P23	104	OTT	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-13	P23/P24	104	OTT	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-14	P24/P26	11	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-15	P26/P27	162	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-16	P27/P28	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-17	P28/P30	162	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-18	P30/P31	162	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-19	P31/P32	11	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-20	P32/P34	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-21	P38/P39	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-22	P41/P42	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-23	P43/P44	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-24	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-25	P55/P54	02	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A

NOTES:
N/A: INFORMATION NOT AVAILABLE FROM QA/QC COLLECTION.

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Destructive Test Log

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SAMPLE ID#	SEAM NUMBER	MACHINE NUMBER	SEAMERS INITIALS	TEST MODE	FIELD TEST RESULTS IN LBS/IN SAMPLE NUMBER 1	2	3	4	5	PASS/FAIL
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-26	P50/P51	20	TUI	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-27	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-28	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-29	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-30	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-31	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-32	P70/P71	2	TC	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-33	P71/P73	20	TUI	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-34	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-35	P76/P77	2	TC	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-36	P79/P81	2	TC	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-37	P82/P84	2	TC	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-38	P86/P84	20	TUI	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-39	P99/P102	20	TUI	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-40	P105/P104	20	TUI	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-41	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-42	P108/P109	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-43	P109/P111	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-44	P114/P115	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-45	P101/P100	N/A	MT	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-46	P86/P87	20	TUI	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-47	P94/P88	20	TUI	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-48	P122/P123	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-49	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-50	U15/U17	20	TUI	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A

NOTES:
N/A: INFORMATION NOT AVAILABLE FROM QA/QC COLLECTION.

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Destructive Test Log

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SAMPLE ID#	SEAM NUMBER	MACHINE NUMBER	SEAMERS INITIALS	TEST MODE	FIELD TEST RESULTS IN LBS/IN SAMPLE NUMBER 1	2	3	4	5	PASS/FAIL
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-51	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-52	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-53	N/A	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-54	U9/U8	N/A	N/A	SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						

NOTES:
N/A: INFORMATION NOT AVAILABLE FROM QA/QC COLLECTION.

Attachment F

Repair Log

CDM

CLIENT _____ JOB NO. _____ COMPUTED BY _____

PROJECT _____ DATE CHECKED _____ DATE _____

DETAIL _____ CHECKED BY _____ PAGE NO. _____

	REPAIR #	SEAM/LOCATION	WELDER	Machine	Date	NBOX Pass	Test Date	Tester	Size
	R-86	X P56/P58/P56	OTT	#4	2/11/09		2-11/09	MT	(1x1
	R-85	X P58/P46/P56	OTT	#6	2/11/09	P	2/11/09	MT	(1x1)
	R-84	X P46/P56/P55	OTT	#6	2/11/09	P	2/11/09	NA	(1x2
	R-83	X P46/P45/P55	OTT	#6	2/11/09	P	2/11/09	MT	(1x2
	R-81	X P45/P55/P54	OTT	#6	2/11/09	P	2/11/09	MT	1x1
S-25	R-82	DS P54/P55	NA	NA	NA	P	2/11/09	OTT	(1.5x4
DS-24	R-80	DS P45/P54 5' W of R-68	NA	NA	NA	P	2/11/09	OTT	(1.5x4'
	R-68	X P45/P54/P47 1x1	NA	NA	NA	P	2/11/09	MT	(1x1)
		M P54/P47 (1'E of X-Repair) 1x1	OTT	#6	2/11/09	P	2/11/09	MT	(1x1)
	R-73	X P54/P47/P49/P50	OTT	#6	2/11/09	P	2/11/09	MT	(2x2)
	R-74	X P54/P50 (2' E of R-73)	OTT	#6	2/11/09	P	2/11/09	MT	(1x4
	R-75	X P49/P50/P48	OTT	#6	2/11/09	P	2/11/09	MT	(2x3)
	R-72	X P49/P47/P48	OTT	#6	2/11/09	P	2/11/09	MT	(2x2)
	R-71	X P47/P48/P59	OTT	#6	2/11/09	P	2/11/09	MT	2x4)
	R-70	M P59/P49 mid seam	OTT	#6	2/11/09	P	2/11/09	MT	(1x)
	R-69	X P47/P60/P59	OTT	#6	2/11/09	P	2/11/09	MT	3/4" (2x
	R-76	X P54/P50/P51	OTT	#6	2/11/09	P	2/11/09	MT	(1x1)
DS-26	R-77	DS P50/P51 (4' NE of R-76)	NA	NA	NA		2/11/09	OTT	(2x4)
	R-78	X P54/P52/P51	OTT	#6	2/11/09	P	2/11/09	MT	(1x2)
	R-79	X P54/P52/P53	OTT	#6	2/11/09	P	2/11/09	MT	(2x2)
	R-67	X P46/P45/P44	OTT	#6	2/11/09	P	2/11/09	MT	(1x1)
	R-65	M P44/P43 (50' upslope from AT)	OTT	#6	2/11/09	P	2/11/09	MT	1x1
	R-66	DS P43/P44 (VTOK OTT 2/11/09)	NA	NA	NA	P	2/11/09	OTT	(2x4)
	R-114	MP P44							
	R-64	DS P41/P42 (VTOK OTT 2/11/09)	NA	NA	NA	P	2/11/09	OTT	(2x4)
	R-63	X P40/P41/P42	OTT	#6	2/11/09	P	2/11/09	MT	(1x1)
	R62	M P40/P39 (50' upslope-EAST)	OTT	#6	2/11/09	P	2/11/09	MT	(1x1)
	R61	X P40/P41/P39	OTT	6	2-11/09	P	"	MT	(1x1)
S-21	R60	DS P39/P38	NA	NA	NA	P	2/11/09	OTT	(2x4)
	R58	X P36/P37/P38	OTT	6	2/11/09	P	2/11/09	MT	(1x1)
V-2	R59	MS P37/P38	OTT	6	2/11/09	P	2/11/09	MT	(2x4)
	R51 or 57	X P36-P37/P35	OTT	6	2/11/09	P	2/11/09	MT	(2x2)
	R56	Seam P35/P?	NA	NA	NA	P	2/11/09	MT	200'
	R UN1	M PG3/PG4 EOSoil	NV	6	12/13/08	P	12/13/08	LJ	(2x3)
	R3	M PG3/PG4 (6' upslope from AT)	NA	NA	NA	P	12/15/08	LJ	(1x2)
	R9	X PG6/PG7/PG11	NV	unreadable	—	P	12/13/08	LJ	2x4
3 Panels	RUN2	X PG7/PG11/P8	NV	100	12/13/08	P	12/13/08	LJ	2x2
	RUN3	M P8/PG11 (10' from top of P8 104 from TOS AT)	NV	108	12/13/08	P	12/13/08	LJ	(2x3)
DS-5	R10	M PG13/PG14	NA	NA	NA	P	12/13/08	LJ	(2x4)
DS-6	R41	M PG14/PG15	NV	108	12/13/08	P	12/13/08	LJ	(2x4)
	R19	X PG15/P16/P17	CEE	108	12/4/08	P	12/15/08	LJ	(1x1)
	R20	M - P16/P17 (6' from west edge) 15' from east edge)	Unreadable-dirt		12/4/08	P	12/15/08	LJ	(1x2)
	R-21	X P16-P17/P18	CEE	108	12/4/08	P	12/15/08	LJ	(2x3)
DS-7	R-42	M P17/PG15	NA	NA	NA	P	12/15/08	LJ	(2x4)

NOTES:

UN - Unnumbered

X - X-seam - junction of panels ; M - Mid seam ; DS - Destruct ; MP - MidPanel

CDM

CLIENT _____ JOB NO. _____ COMPUTED BY _____

PROJECT _____ DATE CHECKED _____ DATE _____

DETAIL _____ CHECKED BY _____ PAGE NO. _____

* Needs Testing

	R-22	M P18|P19	CEE	108	12/4/08	P	12/15/08	LJ	(1x1)		
DS-9	R 44	DS P19|P20	NA	NA	NA	P	12/15/08	LJ	(2x5)		
DS-10	R45	DS P20|P21	NA	NA	NA	P	12/15/08	LJ	(2x5)		
	R2601	X P20|P21|P121	NA	NA	NA	P	3/10/09	MT	(1x1)		
	R2602	X P19|P20|P121	NA	NA	NA	P	3/10/09	MT	(1x1)		
	R2603	X P18|P19|P121	NA	NA	NA	P	3/12/09	NA	(2x3)		
	R2604	X P18|P121|P123	NA	NA	NA	P	3/12/09	NA	(2x3)		
	R2605	X P116|P18 P|123	NA	NA	NA	P	3/12/09	NA	(1x1)		
DS-8	R43	DS/M P16|P18	NA	NA	NA	P	12/18/09	LJ	(2x4)		
2E of R265	R265A	M P|16|P123	NA	NA	NA	P	3/12/09	NA	(1x1)		
E of R265	R2606	M P16|P123	NA	NA	NA	P	3/12/09	NA	(1x1)		
	R2607	X P16|P615|P123	NA	NA	NA	NA	NA	NA	(1x1)	*	
	R2604	X P123|P615|P614	NA	NA	NA	NA	NA	NA	(2x3)	*	
	R271	X P123|P614|P613	NA	NA					(1x1)	*	
	R272	X P123 - P613|P612	NA →						(2x4)	*	
	R130	X P123|P611|P612|U19	NA →			P	3/12	NA	(2x4)		
	R131	X P123|U17|U15	NA →			P	3 covered	NA	(1x1)		
	R132	X P123|P122|U15	NA			P	3/12	NA	(1x2)		
	R133	X P122|U15|P68	NA →			P	3/12	NA	(1x2)		
	R2581	X P122|68|70	NA →			P	3/12	NA	(2x2)		
	R2608	M P122|P123 (128' from U15|U19)	NA →			P	3/12	NA	(1x1)		
DS-48	R270	M P122|P123 (91' from U15|U17)	NA →			P	3/19	NA	(2x4)		
	R257	X P122|P123|P121	NA →			P	3/12	NA	(2x4)		
	R254	X P121|P119|P122	NA →			P	3/12	NA	(1x1)		
	R255	M P119|P122 (11' from P119|P121)	NA →			P	3/12	NA	(1x1)		
	R254	X P122|P119|P99	NA →			P	3/12	NA	(1x1)		
	R258	X P121|P119|P120	NA →			P	3/10/09	MT	(2x2)		
	R247	X P120|P119|P99	NA →			P	3/10/09	MT	(1x1)		
	R246	X P120|P99|8 Large Patch	NA →			P	3/10/09	NA	(1x1)		
	R245	X P22| P120|Large Patch	NA →			P	3/10/09	NA	(3x3)		
8' 1 4	Large Patch	R245|P22|P23|P99|P120				P	extension	3/6/09	MT	(8x8x4x1)	
8' 2 3 5	R243	P23|P99|P104	NA → NA			P		3/10/09	MT	(5x5x5x2)	
	R259	P21|P22|P120	NA → NA			P		3/10/09	MT	(1x1)	
DS-11	R46	DS P21|P22	NA → NA			P		12/15/08	LJ	(2x5)	
	R23	M P22|P23 West corner	NA → NA			P		12/15/08	LJ	(1x1)	
DS-12	R47	M P22|P23 W	NA → NA			P		12/15/08	LJ	(2x4)	
	R27	M P23|P25 (10' from AT)	NA	NA	12/4/08	P		12/15/08	LJ	(1x1)	
	R26	M P23|P25 (120' from TOP)	NA	NA	NA	P		12/15/08	LJ	(1x2)	
	R25	X P23| P24-P25	NA	NA	NA	P		12/15/08	LJ	(1x1)	
DS-13	R48	DS P23|P24 (70' from TOP)	NA	NA	NA	P		12/15/08	LJ	(2x4)	
DS-14	R49	DS P24|26		NA →		P		12/15/08	LJ	(2x4)	
	R unnumbered	X P24-P25| P26		NA →		P		12/15/08	LJ	(1x2)	
DS-15	R50	DS P26|P27	NA →			P		12/15/08	LJ	(2x4)	*
V-4	R29	M P26|P27	NA →			P		12/15/08	LJ	(5x8)	
DS-16	R51	M P27|P28	NA →			P		12/15/08	LJ	(2x4)	
X	R29 (2)	X P27| P28-P29	NA →			P		12/15/08	LJ	(1x1)	
	R30	MP P28 3' Upstream of X-Sec in middle	NA →			P		12/15/08	LJ	(2x2)	

CDM

CLIENT _____ JOB NO. _____ COMPUTED BY _____

PROJECT _____ DATE CHECKED _____ DATE _____

DETAIL _____ CHECKED BY _____ PAGE NO. _____

	R-31	X P29-P28|P30	NA	NA	NA	P	12/15/08	LJ	(1x2)
DS-17	R-52	DS P29 | P30	NA	→		P	12/15/08	LJ	(2x4)
	R-32	P30|P31	NA	→		P	NA	LJ	(1x2)
DS-18	R-53	P30|P31	NA	→		P	12/15/08	LJ	(2x4)
	R-33	X P31|P32-P33	NA	→		P	12/15/08	RS	(1x2)
	R-54	M P31|P32	NA	→		P	12/15/08	LJ	(2x4)
DS-20	R-55	DS P32|P34	NA	→		P	12/15/08	LJ	(2x4)
	R-34	X P33-P32|P34	NA	→		P	12/15/08	LJ	(1x2)
	R-35	X P33 | P34-P-35	NA	→		P	12/15/08	LJ	(2x3)
	R-216	X P35|P98|P96|P97	OTT	6	2/24	P	NA	MT	(2x3)
	R-218	X P35|P97|P95	OTT	6	2/24	P	NA	MT	(1x1)
	R-217	X P96-P97|P95	OTT	#6	2/24	P	NA	MT	(1x2)
	R-219	X P35|P34|P95	OTT	NA	2/24	P	NA	MT	(1x1)
	R-220	X P34|P95|P94	OTT	6	2/24	P	NA	MT	(2x2)
DS-47	R-221	M P94|P88	NA	→		P	3/12	MT	(2x4)
	R-222	X P34|P94|P88|P87	OTT	6	2/24	P	NA	MT	(2x3)
	R128	M P35|U17 (5' from P35|Leg Path)	~~NA~~			P	3/12	NA	(1x)
	R127	X P35|P37|U17	~~NA~~			P	3/12	NA	(1x)
	R126	X P37|P38|U17	~~NA~~			P	3/12	NA	(1x2)
	R125	X P38|P39|U17	~~NA~~			P	3/12	NA	(1x8)
	R124	X P39|P41|U17	~~NA~~			P	3/12	NA	(1x2)
	R123	X P41|P42|U17	~~NA~~			P	3/12	NA	(1x2)
	R122	M P42|U17				P	3/12	NA	(1x1)
	R121	X Corner of R-42|U17	~~NA~~			P	3/16	NA	(2x2)
	R120	P42|U17|P126				P	3/16	NA	(2x2)
	R142	X U17|U15|P126				P	3/16	NA	(1x1)
DS-50	R140	M U17|U15					→		(2x4)
	R131	X P123|U17|U15	~~NA~~			P	~~NA~~	~~NA~~	(1x1) OK

CDM
One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: +1 617 452-6000
fax: +1 617 452-8000

October 8, 2009

Ms. D. Lynne Welsh
Acting Solid Waste Section Chief
Massachusetts Department of Environmental Protection
Central Regional Office
627 Main Street
Worcester, Massachusetts 01608

Subject: Unilateral Administrative Order (UAO-CE-09-4008)
Item 21.A – Selection of Construction Contractor
Flint Road Landfill in Charlton, Massachusetts

Dear Ms. Welsh:

On behalf of the Town of Charlton, Massachusetts (Town), Camp Dresser & McKee Inc. (CDM) submits this update to Item 21.A – Selection of a Construction Contractor, under the above-referenced Unilateral Administrative Order (UAO) issued by the Massachusetts Department of Environmental Protection (MassDEP) on August 27, 2009.

T. Ford Company, Inc. of Georgetown, Massachusetts was the selected qualified bidder for the stabilization of the Charlton Landfill. The contract was awarded on September 24, 2009, and executed on October 8, 2009. Equipment has been mobilized to the site.

Please do not hesitate to contact me at (617) 452-6541 if you have any questions.

Very truly yours,

Laura A. Bugay, P.E.
Camp Dresser & McKee Inc.

cc: Charlton Board of Health
Robin Craver, Charlton
Mark Reich, Kopelman & Paige
Jonathan Silverstein, Kopelman & Paige
C. Koehler, CDM
L. Bugay, CDM

MJ00633.doc

One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: +1 617 452-6000
fax: +1 617 452-8000

October 15, 2009

Ms. D. Lynne Welsh
Acting Solid Waste Section Chief
Massachusetts Department of Environmental Protection
Central Region
627 Main Street
Worcester, Massachusetts 01608

Subject: Unilateral Administrative Order (UAO-CE-09-4005)
Flint Road Landfill
Charlton, Massachusetts
Monthly Status Report

Dear Ms. Welsh:

On behalf of the Town of Charlton (the Town), Camp Dresser & McKee, Inc. (CDM) is responding to the Unilateral Administrative Order (UAO) dated August 27, 2009 regarding the Flint Street Landfill in Charlton, Massachusetts. Section IV - Disposition and Order requires the Town to complete several Action Items. Action Item 21 J requires the Town to submit a monthly status report, prepared by a registered professional engineer, by the 15th of each month that addresses Action Items A through H. This submittal responds to Action Item 21 J.

The attached table summarizes the status of each of the UAO required Action Items. Future progress reports will provide a status of the required UAO Action Items and the completion of the final landfill closure.

As noted on the table, a Contractor has been selected to conduct site stabilization. The Contractor has begun mobilization to the site and construction will start next week.

Please do not hesitate to contact me at (617) 452-6589, if you have any questions or require further information.

Very truly yours,

Laura A. Bugay, P.E.
Camp Dresser & McKee Inc.

Attachments

cc: Board of Health, Town of Charlton
Robin Craver, Town of Charlton
Jim Philbrook, Town of Charlton
Chris Koehler, CDM
Bruce Haskell, CDM

Monthly Status Report
Summary of Required Tasks
for Unilateral Administrative Order[a]
Between the Town of Charlton and the Massachusetts
Department of Environmental Protection
As of October 15, 2009

Consent Order Paragraph	*Description*	*Due Date[a]*	*Status*
Section IV. Paragraph 21A.	Submit name of closure completion Contractor.	September 11, 2009.	COMPLETED. Contract awarded on September 24, 2009. Notification in Correspondence dated October 7, 2009.
Section IV. Paragraph 21B.	Confirm that FML is temporarily anchored.	September 11, 2009.	IN PROGRESS. Temporary anchor plan developed and included in awarded contract.
Section IV. Paragraph 21C.	Confirm stormwater has been re-directed to basin.	September 26, 2009.	IN PROGRESS. Temporary stabilization and erosion control plan developed and included in awarded contract.
Section IV. Paragraph 21D.	Submit evaluation report.	September 3, 2009.	COMPLETED. Submitted on September 3, 2009.
Section IV. Paragraph 21E.	Submit FML installation information.	September 26, 2009.	COMPLETED. QA/QC information gathered was submitted September 26, 2009.
Section IV. Paragraph 21F.	Complete perimeter drainage system.	September 26, 2009.	IN PROGRESS. Temporary stabilization and erosion control plan developed and included in awarded contract.
Section IV. Paragraph 21G.	Provide cleanout and reconstruction plan for drainage basin.	November 25, 2009.	IN PROGRESS. Revised grading plan developed and included in awarded contract.
Section IV. Paragraph 21H.	Stabilize perimeter access road.	November 25, 2009.	IN PROGRESS. Temporary stabilization and erosion control plan developed and included in awarded contract.
Section IV. Paragraph 21I.	Submit initial status report.	September 3, 2009.	COMPLETED. Submitted September 3, 2009.
Section IV. Paragraph 21J.	Submit monthly status reports.	Due the 15th of every month.	Next report to be submitted November 15, 2009.

[a]Due dates reflect Unilateral Administrative Order (UAO) received August 27, 2009.

CDM
One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: 617 452-6000
fax: 617 452-8000

November 17, 2009

Ms. D. Lynne Welsh
Acting Solid Waste Section Chief
Massachusetts Department of Environmental Protection
Central Regional Office
627 Main Street
Worcester, Massachusetts 01608

Subject: Unilateral Administrative Order (UAO-CE-09-4008)
Item 21.E - FML Installation Quality Assurance/Quality Control Information
Flint Road Landfill, Charlton, Massachusetts

Dear Ms. Welsh:

On behalf of the Town of Charlton, Massachusetts (Town), Camp Dresser & McKee Inc. (CDM) submits additional information pertaining to Item 21.E - Flexible Membrane Liner (FML) Installation Quality Assurance/Quality Control Information, under the above-referenced Unilateral Administrative Order (UAO) issued by the Massachusetts Department of Environmental Protection (MassDEP) on August 27, 2009.

CDM collected the FML installation quality assurance /quality control information as documented on the FML, and submitted the information in a letter dated September 26, 2009. This previous submittal did not include the panel layout drawing as additional time was necessary for its completion. The panel layout plan is enclosed; it shows the approximate layout of the installed 40-mil HDPE FML, the panel numbers and the destructive sample locations. Additionally, in finalizing the layout plan, additional destructive sample locations were found. Updated destructive sampling logs are also enclosed.

Please do not hesitate to contact me at (617) 452-6589 if you have any questions.

Very truly yours,

Laura A. Bugay, P.E.
Camp Dresser & McKee Inc.

Attachment

cc: Charlton Board of Health
Robin Craver, Charlton
Mark Reich, Kopelman & Paige
Jonathan Silverstein, Kopelman & Paige
C. Koehler, CDM
B. Haskell, CDM

MJ00688.doc

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Destructive Test Log

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SAMPLE ID#	SEAM NUMBER	MACHINE NUMBER	SEAMERS INITIALS	TEST MODE	FIELD TEST RESULTS IN LBS/IN SAMPLE NUMBER 1	2	3	4	5	PASS/FAIL
N/A	DS-1	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-2	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-3	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-4	PG12/PG13	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-5	PG13/PG14	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-6	PG14/PG15	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-7	N/A	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-8	P16/P18	11	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-9	P19/P20	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-10	P20/P21	11	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-11	P21/P22	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-12	P22/P23	104	OTT	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-13	P23/P24	104	OTT	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-14	P24/P26	11	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-15	P26/P27	162	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-16	P27/P28	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-17	P28/P30	162	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-18	P30/P31	162	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-19	P31/P32	11	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-20	P32/P34	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-21	P38/P39	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-22	P41/P42	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-23	P43/P44	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-24	P45/P54	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-25	P55/P54	02	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A

NOTES:
N/A: INFORMATION NOT AVAILABLE FROM QA/QC COLLECTION.

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Destructive Test Log

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SAMPLE ID#	SEAM NUMBER	MACHINE NUMBER	SEAMERS INITIALS	TEST MODE	FIELD TEST RESULTS IN LBS/IN SAMPLE NUMBER 1	2	3	4	5	PASS/FAIL
N/A	DS-26	P50/P51	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-27	P64/P65	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-28	P65/P66	2	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-29	P66/P67	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-30	P67/P68	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-31	P68/P70	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-32	P70/P71	2	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-33	P71/P73	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-34	P74/P75	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-35	P76/P77	2	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-36	P79/P81	2	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-37	P82/P84	2	TC	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-38	P85/P84	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-39	P99/P102	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-40	P105/P104	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-41	P106/P108	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-42	P108/P109	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-43	P109/P111	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-44	P114/P115	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-45	P101/P100	N/A	MT	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-46	P86/P87	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-47	P94/P88	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-48	P122/P123	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-49	P70/P122	N/A	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-50	U15/U17	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A

NOTES:
N/A: INFORMATION NOT AVAILABLE FROM QA/QC COLLECTION.

CDM

One Cambridge Place
50 Hampshire Street
Cambridge, MA 02139
(617) 452-6000

Destructive Test Log

Project: Flint Road Landfill, Charlton Ma
Collection of liner installation data

Product: TX- Textured 40-mil HDPE (Solmax)
MS-Microspike 40-mil HDPE (Agru America)

DATE	SAMPLE ID#	SEAM NUMBER	MACHINE NUMBER	SEAMERS INITIALS	TEST MODE	FIELD TEST RESULTS IN LBS/IN SAMPLE NUMBER 1	2	3	4	5	PASS/FAIL
N/A	DS-51	P126/P127	20	N/A	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-52	P128/U2	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-53	U3/U4	20	TUI	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
N/A	DS-54	U9/U8	20	MT	PEEL	N/A	N/A	N/A	N/A	N/A	N/A
					SHEAR	N/A	N/A	N/A	N/A	N/A	N/A
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						

NOTES:
N/A: INFORMATION NOT AVAILABLE FROM QA/QC COLLECTION.

N

N/F
NANCY L JACKSON
BK 15671, PG 330
51-B-3.1

N/F
FRANCO & LINA D'ANNUNZIO
BK 33821, PG 319
51-B-3

N/F
MICHAEL D & ELIZABETH L RESENER
BK 35082, PG 177
51-B-5

N/F
TOWN OF CHARLTON
BK 18612, PG 296
51-B-4.1

N/F
TOWN OF CHARLTON
BK 18612, PG 296
51-B-4

N/F
TOWN OF CHARLTON
51-B-2.1

EDGE OF EXISTING CONDITIONS SURVEY

EDGE OF EXISTING 40 MIL HDPE FML

SOIL STOCKPILE

OLD TOWN ROAD

FLINT ROAD

STANDARD OIL CO. OF NEW YORK 33' FT. WIDE EASEMENT BK 2540, PG 241

NEW ENGLAND POWER CO. 80' FT. WIDE EASEMENT BK 3428, PG 47 BK 3432, PG 132 PLAN BK 215, PLAN 107

N69°18'25"E 167.30'

N69°17'51"E 518.16'

S82°40'48"W 565.20'

N70°09'54"E 361.27'

N70°57'07"E 359.02'

N84°31'06"E 185.05'

N81°02'57"E 81.64'

S60°12'07"E 26.08'

S89°22'23"E 7.19'

S00°13'15"E 191.36'

N69°36'26"E 258.69'

N76°40'49"E 9.64'

N77°21'51"E 110.09'

S76°10'56"E 9.66'

S16°04'42"W 688.71'

S22°08'16"W 534.13'

N75°49'12"W 399.73'

N75°49'12"W 641.70'

V-1 V-2 V-3 V-4 V-5 V-6

LEGEND

EXISTING CONDITIONS

- ABUTTERS LOT LINE
- PROPERTY LINE
- EASEMENT
- STONE WALL
- 2003 INTERMEDIATE CONTOURS
- 2003 INDEX CONTOURS
- 2009 INTERMEDIATE CONTOURS
- 2009 INDEX CONTOURS
- TREE LINE
- STONE WALL
- WETLAND
- DEPRESSION CONTOURS
- SPOT ELEVATION
- IRON PIPE FOUND
- CONCRETE BOUND FOUND
- UTILITY POLE
- LANDFILL GAS VENT

NOTES

1. THIS PLAN IS A COMPILATION OF TWO SURVEY PLANS BOTH CONDUCTED BY WSP SELLS. AN ACTUAL ON THE GROUND FIELD SURVEY CONDUCTED ON AUGUST 6, 2009 & AUGUST 10, 2009; AND AN AERIAL SURVEY COMPLETED ON APRIL 2003 SUPPLEMENTED BY GROUND SURVEY CONDUCTED DECEMBER 2005.
2. THE HORIZONTAL DATUM SHOWN HEREON NAD83.
3. THE VERTICAL DATUM SHOWN HEREON REFERENCES NAVD88.
4. WETLANDS EXIST TO THE SOUTH AND SOUTHWEST OF THE SITE. WETLAND FLAGS NOT SHOWN.
5. THE HDPE PANEL LAYOUT AND DESTRUCTIVE SAMPLE LOCATIONS ARE A RESULT OF FIELD MEASUREMENT CONDUCTED IN SEPTEMBER 2009 AND ARE APPROXIMATE.
6. PANEL NUMBER DESIGNATIONS ARE AS FOLLOWS:
   - P-#: THE PANEL NUMBER AS OBSERVED ON THE HDPE.
   - U-#: THESE PANELS WERE NOT NUMBERED, THEREFORE PANEL NUMBERS WERE ASSIGNED TO THEM BY CDM.
   - P-G#: THE ACTUAL PANEL NUMBERS WERE COVERED BY THE SOIL STOCKPILE LOCATED AT THE TOP OF THE LANDFILL, THEREFORE CDM GUESSED THE PANEL NUMBERS BASED UPON THE ADJACENT PANEL NUMBERING PATTERN.

PLAN
1" = 50'
25 0 50

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: –
DRAWN BY: L. BUGAY
SHEET CHK'D BY: –
CROSS CHK'D BY: –
APPROVED BY: –
DATE: SEPTEMBER 2009

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting • engineering • construction • operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH

FLINT ROAD LANDFILL CLOSURE PROJECT

EXISTING 40-MIL HDPE CAP PANEL LAYOUT PLAN

PROJECT NO. 75398-72037
FILE NAME: CSTPL001

SHEET NO.
PL-1

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

Ms. Robin L. Craver
Town of Charlton Administrator
37 Main Street
Charlton, MA 01507

Re: MassDEP Response to Landfill Closure Evaluation Report
Charlton - Flint Road Landfill Closure

Dear Ms. Craver:

The Massachusetts Department of Environmental Protection (MassDEP) has completed the review of the September 3, 2009 report entitled *Landfill Closure Evaluation Report, Town of Charlton, Massachusetts* (the "Report") prepared by Camp, Dresser & McKee, Inc. (CDM) on behalf of the Town of Charlton (the "Town"). The Report was prepared in accordance with paragraph 21.D of the August 27, 2009 Unilateral Administrative Order (UAO-CE-09-4005) (the "UAO") issued to the Town by MassDEP. In addition to the Report, CDM provided correspondence to MassDEP dated September 11, 2009 that meets the requirement of UAO paragraph 21.B, confirming that the flexible membrane liner ("FML") currently in place over the grading/shaping and gas venting layers has been adequately anchored and stabilized to protect the FML from damage during completion of closure activities.

Based on a review of the Report MassDEP provides the following comments, with reference to the relevant UAO citation(s):

1. UAO Paragraph 21.D.2

MassDEP will accept the gas venting layer as installed, and waive the requirement for any further measurement or testing beyond what was presented in the Report. However, should the Town obtain any additional information regarding the gas venting layer; this information should be forwarded to MassDEP.

Regarding evaluation of the existing passive gas venting system, MassDEP requests that the Town evaluate all six (6) vents using the methods outlined in the Report. Each of the six (6) vents shall be screened for methane, and a total depth measured as proposed. Results shall be reported to MassDEP, with recommendations for any necessary corrective measures.

2. UAO Paragraphs 21.D.3 and 21.D.4

Regarding proposed alternative cap cross-section, and use of on-site stockpiled soils, MassDEP hereby approves the proposed cap cross-section with respect to the exceedance of the required 3:1 (H:V) ratio. MassDEP understands that the final configuration of the cap will involve installation of stormwater benches contoured using the final cover materials.

Regarding the use of existing stockpiled soils above the FML, MassDEP requests that in addition to the sampling and analytical testing conducted thus far, additional soil samples shall be collected such that there is at least one soil sample per one-thousand cubic yards. Given that the volume of soils is estimated at 23,500 cubic yards, and ten (10) soil samples have been collected thus far, at least fourteen (14) additional samples shall be collected for laboratory analysis of the EPH/PAH target analytes and RCRA 8 metals. Sample locations shall be documented in the field to facilitate segregation of soils containing contaminant concentrations exceeding screening benchmarks should such segregation be necessary.

Since the beneficial re-use of the stockpiled soils has been proposed, comparison of analytical results to the MCP Method 1 soil standards, as presented in the Report, is not an appropriate comparison. Therefore, for the purpose of evaluating the reuse of the stockpiled soils, MassDEP requests that the Town compare results to the S-2/GW-1 and S-3/GW-1 Beneficial Use Determination (BUD) values presented in MassDEP's March 18, 2009 *Draft Interim Guidance Document for Beneficial Use Determination Regulations – 310 CMR 19.060.*

Based on a comparison of analytical results to the aforementioned BUD values, MassDEP may request performance of an Ecological Risk Assessment to evaluate potential risks associated with re-use of stockpiled soils that exceed BUD values, and to determine what additional risk management efforts would be needed should re-use of these materials be conducted.

Based on the results of additional sampling and analytical testing, as well as the performance of an ecological risk assessment (if warranted), MassDEP will make a determination regarding the reuse of stockpiled soils in the minimum 12-inch thick soils overlying the synthetic drainage net. MassDEP understands that imported topsoil will be used in the final minimum 6-inch thick vegetative support layer.

Regarding the long-term storage of excess borrow soils following completion of capping, MassDEP hereby denies the request for the long-term storage of the materials in the northeastern portion of the Site as proposed. The Town will be required to identify a suitable location for either re-use or disposal for the excess soils. In addition, MassDEP hereby requests that all non-soil materials (i.e., waste) removed from the soils during on-site screening be transported off-site for proper disposal. In addition, MassDEP requests that the Town remove all solid waste material from along and within the eroded perimeter access road. Significant amounts of debris along the perimeter of the site within and adjacent to the access road have been observed during recent MassDEP inspections. This material shall be transported off-site for proper disposal and/or recycling.

3. UAO Paragraph 21.D

The Town has proposed the use of synthetic drainage net in place of the sand drainage layer. MassDEP hereby approves the modification, and notes that MassDEP previously approved such a substitution in correspondence to the Town dated September 29, 2008. In the aforementioned correspondence, MassDEP approved a prior request authorizing the use of "... nominally 160 ml thick SKAPS Transnet HDPE Composite 160 material..." as an alternative to the six-inch sand drainage layer.

Regarding the question as to whether the existing FML encompasses the entire lateral extent of waste, MassDEP will not require confirmation of the edge of waste through test pit excavation. However, MassDEP has concerns regarding leachate breakouts and landfill gas odors noted in the northwest portion of the site during recent MassDEP inspections. Therefore, MassDEP requests that the Town conduct additional assessment to determine the nature and origin of the leachate seeps and landfill gas emissions in the northwest portion of the landfill, and whether the configuration of the FML has failed to prevent the leachate breakout and landfill gas emissions. In addition, the Town will be required to establish a site-wide landfill gas, surface water, and groundwater post-closure monitoring network with sufficient monitoring points necessary to implement a rigorous long-term post-closure monitoring effort.

4. UAO Paragraphs 21.D.6 and 21.G

MassDEP accepts the proposed revisions to the existing stormwater detention system which include the cleanout and reconstruction of the detention basin. In addition, MassDEP understands that the final configuration of the cap will involve installation of stormwater benches contoured using the final cover materials, as well as the installation of down-chutes, both of which were not constructed into the subgrade.

MassDEP accepts the proposed regrading and reconfiguration of the access roads. However, because this was not part of the approved 2006 Corrective Action Design (CAD), and the road was apparently constructed with the same "COMM-97" grading and shaping materials as used beneath the FML, MassDEP will require geotechnical testing to confirm the make-up of the road and ensure its structural integrity. MassDEP will also require analytical testing of the road materials to assess potential ecological risks associated with reuse of the materials beyond the FML and outside of the normal re-use scenario. In addition, as noted above in Item 2, the Town shall remove all solid waste material from along and within the eroded perimeter access road during regrading/reconstruction of the perimeter access roads. This material shall be transported off-site for proper disposal and/or recycling.

MassDEP understands that additional soils beyond the 115,000 cubic yards as noted in the 2006 CAD approval was used for contouring/grading and shaping the landfill prior to installation of the gas venting layer and FML. Since removal of the excess grading and shaping soils would involve removal of the FML and gas venting layer, MassDEP accepts this unplanned modification to the landfill closure. In addition, MassDEP approves the proposed cap cross-section with respect to the exceedance of the required 3:1 (H:V) ratio,

which likely resulted from the use of grading and shaping materials beyond the approved volume of 115,000 cubic yards.

Regarding wetland/site stabilization, MassDEP requests that the Town implement the site stabilization/restoration methods requested by MassDEP - Bureau of Resource Protection (BRP) Wetlands Program, which include the following:

- The use of floc log polymers at the discharge from the detention basin once cleaned out.
- The use of wood mulch or bark mulch at the roadway sideslopes along the wetlands rather than attempting to apply loam and seed during the late stages of the 2009 growing season.
- Implement better erosion control measures at the entrance road.

If you have any further questions or comments regarding this matter, please contact me at (508) 849-4007.

Sincerely,

Date: 11/06/09

D. Lynne Welsh
Acting Section Chief
Solid Waste Management Group

Cc: Charlton Board of Health
Bruce Haskell, P.E., Camp, Dresser & McKee, Inc.

CDM
One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: 617 452-6000
fax: 617 452-8000

November 13, 2009

Ms. D. Lynne Welsh
Acting Solid Waste Section Chief
Massachusetts Department of Environmental Protection
Central Region
627 Main Street
Worcester, Massachusetts 01608

Subject: Unilateral Administrative Order (UAO-CE-09-4005)
Flint Road Landfill
Charlton, Massachusetts
Monthly Status Report

Dear Ms. Welsh:

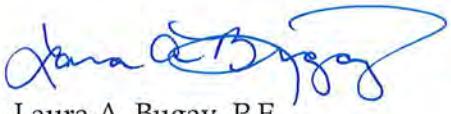
On behalf of the Town of Charlton (the Town), Camp Dresser & McKee, Inc. (CDM) is responding to the Unilateral Administrative Order (UAO) dated August 27, 2009 regarding the Flint Street Landfill in Charlton, Massachusetts. Section IV - Disposition and Order requires the Town to complete several Action Items. Action Item 21 J requires the Town to submit a monthly status report, prepared by a registered professional engineer, by the 15th of each month that addresses Action Items A through H. This submittal responds to Action Item 21 J.

The attached table summarizes the status of each of the UAO required Action Items. Future progress reports will provide a status of the required UAO Action Items and the completion of the final landfill closure.

As noted on the table, the Contractor has begun construction and stabilization of the site is progressing.

Please do not hesitate to contact me at (617) 452-6589, if you have any questions or require further information.

Very truly yours,



Laura A. Bugay, P.E.
Camp Dresser & McKee Inc.

Attachments

cc: Board of Health, Town of Charlton
Robin Craver, Town of Charlton
Jim Philbrook, Town of Charlton
Chris Koehler, CDM
Bruce Haskell, CDM

Monthly Status Report
Summary of Required Tasks
for Unilateral Administrative Order[a]
Between the Town of Charlton and the Massachusetts Department of Environmental Protection
As of November 15, 2009

Administrative Order Paragraph	*Description*	*Due Date[a]*	*Status*
Section IV. Paragraph 21A.	Submit name of closure completion Contractor.	September 11, 2009.	COMPLETED. Contract awarded on September 24, 2009. Notification in Correspondence dated October 8, 2009.
Section IV. Paragraph 21B.	Confirm that FML is temporarily anchored.	September 11, 2009.	IN PROGRESS. Anchor trench is currently being re-constructed.
Section IV. Paragraph 21C.	Confirm stormwater has been re-directed to basin.	September 26, 2009.	IN PROGRESS. Preliminary site grading has directed stormwater to basin.
Section IV. Paragraph 21D.	Submit evaluation report.	September 3, 2009.	COMPLETED. Submitted on September 3, 2009.
Section IV. Paragraph 21E.	Submit FML installation information.	September 26, 2009.	COMPLETED. QA/QC information gathered was submitted September 26, 2009.
Section IV. Paragraph 21F.	Complete perimeter drainage system.	September 26, 2009.	IN PROGRESS. Perimeter drainage system is currently being constructed.
Section IV. Paragraph 21G.	Provide cleanout and reconstruction plan for drainage basin.	November 25, 2009.	IN PROGRESS. Basin has been cleaned out and is currently being re-constructed.
Section IV. Paragraph 21H.	Stabilize perimeter access road.	November 25, 2009.	IN PROGRESS. Perimeter access road is currently being graded and stabilized.
Section IV. Paragraph 21I.	Submit initial status report.	September 3, 2009.	COMPLETED. Submitted September 3, 2009.
Section IV. Paragraph 21J.	Submit monthly status reports.	Due the 15th of every month.	Next report to be submitted December 15, 2009.

[a]Due dates reflect Unilateral Administrative Order (UAO) received August 27, 2009.

CDM
One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: +1 617 452-6000
fax: +1 617 452-8000

December 11, 2009

Ms. Lynne Welsh
Section Chief - Solid Waste
Central Regional Office
Massachusetts Department of Environmental Protection
627 Main Street
Worcester, Massachusetts 01608

Subject: Further Information on Proposed Final Corrective Action Approach at Flint Road Landfill, Charlton, Massachusetts

Dear Ms. Welsh:

As we discussed at our meeting on November 20, 2009, Camp Dresser & McKee Inc. (CDM) has compiled the following information regarding the final corrective actions at the Flint Road Landfill in Charlton. This information is in response to the letter from your office dated November 6, 2009 and is focused on the use of existing on-site soils as part of the final cap and to establish final grades around the site.

Summary

The closure of the Flint Road Landfill included the placement of soils that comply with MassDEP Policies ("Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites," dated July 6, 2001 and "Reuse and Disposal of Contaminated Soils at Massachusetts Landfill (COMM-97-001)," dated August 15, 2001) within the limits of historically landfilled waste and as approved by MassDEP in the Corrective Action Design permit dated June 16, 2006. The prior operator delivered additional soils to the landfill that contain limited amounts of debris typical of "historic fill" and none of the soils visually appear to be from a natural source. The operator used these additional soils to construct the existing perimeter access road, re-grade the site entrance and planned to use after processing, in the capping system above the flexible membrane liner. **These additional soils were not delivered or placed at the site in accordance with either MassDEP's Unlined Landfill or COMM-97-001 policies.**

In our letter report dated September 3, 2009, CDM proposed an approach to use these additional soils as part of the final corrective action and for any excess soils to be placed in a designated permanent holding area on-site. Based on our meeting, CDM is proposing sampling and analysis of the additional soils left outside of the existing flexible membrane liner to determine if they are similar to the ten samples that CDM has already collected and

analyzed. At all locations, these soils will be covered with a six inch thick layer of clean topsoil imported from off-site and the entire site would have a Notice of Landfill Operations filed at the local Registry of Deeds. As outlined below, using risk assessment protocols established under the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000), CDM suggests that the use of these soils at the Charlton Landfill does not pose a potential unacceptable risk to human health, safety or the environment.

CDM understands that this approach is unique to the situation presented by the existing conditions at the Charlton Landfill. It has been developed to address the following project design criteria:

- ***Maintain the Flexible Membrane Liner and Existing Site Limits.*** Given the existing slopes on the perimeter access road and the proximity of property lines and wetland resource areas, the quantity of additional fill soils on-site could not be accommodated without re-grading the entire landfill and either replacing the existing flexible membrane liner or filling in wetland resource areas and extending over the property lines. For example, to cap the perimeter access road the steep slopes would have to be re-graded and would undermine the edge of the existing flexible membrane liner.

- ***Financial Constraints.*** The final closure of the landfill needs to be completed within the funding set aside as the MassDEP-approved financial assurance mechanism under the town's agreement with the prior operator (approximately $1 million) and the additional appropriation at town meeting (approximately an additional $500,000).

Proposed Approach

The prior operator used historic fill soils at the landfill in three areas outside of the existing flexible membrane liner – to construct the perimeter access road around the site perimeter, as grading materials near the entrance to the site and two stockpiles located at the northeastern portion of the site. The two on-site stockpiles were proposed to be utilized as layers of the cap by the prior operator.

As presented in CDM's September 3, 2009 letter, CDM collected ten representative composite samples from the two stockpiles. These samples were analyzed for extractable petroleum hydrocarbons and RCRA 8 metals and the results were generally below S-1 soil standards as established in the MCP.

Previously, CDM proposed three approaches to utilizing the additional soils:

- In areas such as the perimeter access road and the site entrance, grade the additional soils to an appropriate slope and cover with six inches of clean imported topsoil and seed. As an alternate, these areas could be covered with either large rip rap stone or a similar thickness of gravel to create a roadway.

- Materials from the stockpiles will be screened and incorporated in the 12 to 18-inch thick layer over the drainage net in the final cap. This layer will be covered with six inches of clean imported topsoil.

- Excess materials from either the re-grading of the access road or the site entrance or the stockpiles once the cap has been completed will be placed on-site in a designated area, graded and covered with six inches of clean imported topsoil. Screenings from the processing of the two stockpiles will also be placed into this designated area. Any materials observed in the screenings such as asbestos pipe or large pieces of debris will be set aside and sent off-site for proper disposal.

All of these areas, as well as the capped landfill, will be designated in the as-built plan attached to the Notice of Landfill Operations to be filed at the Registry of Deeds in accordance with MassDEP regulations. As required by the regulations, any change to the uses of the site will require the approval of a Post-Closure Use Permit Application under MassDEP regulations.

This approach was based on both the testing of the soils conducted to date and the anticipated future uses of the landfill site. At this time, the town does not propose any active uses for the site. Additionally, the very steep slopes and surrounding wetland resource areas will preclude active uses of the landfill site. Therefore, the only potential exposure route for human health will be the infrequent exposure of either a trespasser or individuals conducting site maintenance and repair.

Technical Justification and Revisions to Approach

The proposed approach was developed based on an evaluation of the potential exposures to individuals that will enter the site (trespassers and individuals conducting periodic site maintenance). Further analytical testing will be conducted to confirm that all the soils on-site are similar to those already tested in the stockpiles. The following is the technical justification of the proposed approach as well as a supplemental sampling program to confirm conditions around the site.

The approach proposed herein is for the upland area of the site, not the wetland resource areas. MassDEP guidance documents establish criteria for wetland sediments. None of the proposed additional soils will be used in existing wetland or replication areas. Also, since the soils will be covered by six inches of clean topsoil, there is only a short-term potential for it to be eroded into the wetland areas prior to the establishment of vegetation.

These conclusions are based on the soils around the site being similar to those that have already been tested. To confirm the quality of the soil considered to date is representative of all the soils imported for reuse at the site, CDM proposes to conduct a supplemental sampling program as follows:

- Around the perimeter access road, CDM will collect five composite samples of soils.
- Additional samples will be collected from the existing stockpiles for the soils that will be utilized as part of the cap. The intent will be to supplement the ten already analyzed samples so that there will be at least one laboratory-analyzed sample per every 1,000 cubic yards of soils used. CDM estimates that a minimum of 16,000 cubic yards of soils will be used in the cap (after screening) so at least six additional samples will be collected and analyzed. Additional tests will be collected of any remaining soils not used in the final cap at the frequency of one per every 1,000 cubic yards.
- A total of five composite samples will be collected from the area around the site entrance where fill soils were placed by the prior operator.

Each composite sample will be made from ten individual samples and will be analyzed for RCRA-8 metals and extractable petroleum hydrocarbons. The results of this assessment will be incorporated into a risk assessment form similar to that prepared for this letter. Further risk assessment may be undertaken given the results of the further sampling.

Assuming that the results of the additional sampling and risk assessment are similar to the testing conducted to date, it is intended that the proposed approach will be implemented.

If the additional testing indicates that all or a portion of the remaining soils is not similar to that previously tested, CDM will develop recommendations to address these soils. Additional final cover, extending the final cap to incorporate these soils, and/or taking the soils to the older town landfill located on an abutting property or removing them off-site for disposal at a licensed facility are possible options.

We are available to meet with you to discuss this further. Please do not hesitate to contact me at (617) 452-6541 or (617) 875-3693 if you wish to discuss it further or have any questions.

Very truly yours,

Bruce W. Haskell

Bruce W. Haskell, P.E.
Camp Dresser & McKee Inc.

cc: Robin Craver, Charlton
Board of Health, Charlton
Laura Bugay, CDM

Resident - Soil: Table RS-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

ShortForm Version 4-06

Vlookup Version v0808

ELCR (all chemicals) = 1E-06
Chronic HI (all chemicals) = 2E+01
Subchronic HI (all chemicals) = 3E+01

1/2 Max. ND or Max Value

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Materials	EPC (mg/kg)	ELCR ingestion	ELCR dermal	ELCR inhalation	ELCR	Chronic HQ ingestion	Chronic HQ dermal	Chronic HQ inhalation	Chronic HQ	Subchronic HQ ingestion	Subchronic HQ dermal	Subchronic HQ inhalation	Subchronic HQ
Acenaphthene	8.1E-01					1.2E-05	2.8E-05		3.9E-05	3.2E-06	5.2E-06		8.5E-06
Acenaphthylene	8.1E-01					2.3E-05	5.5E-05		7.9E-05	6.4E-06	1.0E-05		1.7E-05
Methylnaphthalene, 2-	8.1E-01					1.8E-04	4.1E-04		5.9E-04	4.8E-04	7.8E-04		1.3E-03
Benzo(g,h,i)perylene	8.1E-01					2.3E-05	5.5E-05		7.9E-05	6.4E-06	1.0E-05		1.7E-05
Benzo(k)fluoranthene	1.4E+00	1.1E-08	8.0E-09		1.9E-08	3.2E-05	1.9E-05		5.1E-05	8.8E-06	3.7E-06		1.2E-05
Aromatics C11 to C22	1.4E+02					4.2E-03	9.8E-03		1.4E-02	1.1E-03	1.9E-03		3.0E-03
Aliphatics C19 to C36	1.2E+02					1.5E-04	1.3E-04		2.7E-04	1.4E-04	7.9E-05		2.1E-04
Aliphatics C9 to C18	9.0E+00					2.2E-04	9.2E-04		1.1E-03	6.0E-05	1.7E-04		2.3E-04
Dibenzo(a,h)anthracene	8.1E-01	6.2E-07	4.6E-07		1.1E-06	1.8E-05	1.1E-05		2.9E-05	5.0E-06	2.1E-06		7.1E-06
Naphthalene	8.1E-01					3.5E-05	8.3E-05		1.2E-04	9.7E-06	1.6E-05		2.5E-05
Barium	2.3E+02					2.8E-03	1.2E-03		4.0E-03	2.2E-02	6.4E-03		2.8E-02
Lead	2.8E+02					4.5E-01	4.6E-02	2.0E+01	2.0E+01	1.2E+00	8.7E-02	2.9E+01	3.0E+01
Mercury	8.4E-01					6.8E-03	2.9E-03		9.7E-03	1.9E-02	5.5E-03		2.4E-02
Selenium	1.5E+00					7.3E-04	1.2E-05		7.4E-04	2.0E-03	2.3E-05		2.0E-03
Silver	3.0E-01					1.5E-04	3.1E-04		4.5E-04	4.0E-04	5.9E-04		9.9E-04

Resident - Soil: Table RS-1
Exposure Point Concentration (EPC)
Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

ShortForm Version 4-06

Vlookup Version v0808

ELCR (all chemicals) = 1E-06
Chronic HI (all chemicals) = 5E-01
Subchronic HI (all chemicals) = 1E+00

1/2 Max. ND or Max Value

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	ELCR ingestion	ELCR dermal	ELCR inhalation	ELCR	Chronic HQ ingestion	Chronic HQ dermal	Chronic HQ inhalation	Chronic HQ	Subchronic HQ ingestion	Subchronic HQ dermal	Subchronic HQ inhalation	Subchronic HQ
Acenaphthene	8.1E-01					1.2E-05	2.8E-05	3.9E-05	3.2E-06	5.2E-06	8.5E-06		
Acenaphthylene	8.1E-01					2.3E-05	5.5E-05	7.9E-05	6.4E-06	1.0E-05	1.7E-05		
Methylnaphthalene, 2-	8.1E-01					1.8E-04	4.1E-04	5.9E-04	4.8E-04	7.8E-04	1.3E-03		
Benzo(g,h,i)perylene	8.1E-01					2.3E-05	5.5E-05	7.9E-05	6.4E-06	1.0E-05	1.7E-05		
Benzo(k)fluoranthene	1.4E+00	1.1E-08	8.0E-09		1.9E-08	3.2E-05	1.9E-05	5.1E-05	8.8E-06	3.7E-06	1.2E-05		
Aromatics C11 to C22	1.4E+02					4.2E-03	9.8E-03	1.4E-02	1.1E-03	1.9E-03	3.0E-03		
Aliphatics C19 to C36	1.2E+02					1.5E-04	1.3E-04	2.7E-04	1.4E-04	7.9E-05	2.1E-04		
Aliphatics C9 to C18	9.0E+00					2.2E-04	9.2E-04	1.1E-03	6.0E-05	1.7E-04	2.3E-04		
Dibenzo(a,h)anthracene	8.1E-01	6.2E-07	4.6E-07		1.1E-06	1.8E-05	1.1E-05	2.9E-05	5.0E-06	2.1E-06	7.1E-06		
Naphthalene	8.1E-01					3.5E-05	8.3E-05	1.2E-04	9.7E-06	1.6E-05	2.5E-05		
Barium	2.3E+02					2.8E-03	1.2E-03	4.0E-03	2.2E-02	6.4E-03	2.8E-02		
Lead	2.8E+02					4.5E-01	4.6E-02	5.0E-01	1.2E+00	8.7E-02	1.3E+00		
Mercury	8.4E-01					6.8E-03	2.9E-03	9.7E-03	1.9E-02	5.5E-03	2.4E-02		
Selenium	1.5E+00					7.3E-04	1.2E-05	7.4E-04	2.0E-03	2.3E-05	2.0E-03		
Silver	3.0E-01					1.5E-04	3.1E-04	4.5E-04	4.0E-04	5.9E-04	9.9E-04		

One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: 617 452-6000
fax: 617 452-8000

December 15, 2009

Ms. D. Lynne Welsh
Acting Solid Waste Section Chief
Massachusetts Department of Environmental Protection
Central Region
627 Main Street
Worcester, Massachusetts 01608

Subject: Unilateral Administrative Order (UAO-CE-09-4005)
Flint Road Landfill
Charlton, Massachusetts
Monthly Status Report

Dear Ms. Welsh:

On behalf of the Town of Charlton (the Town), Camp Dresser & McKee Inc. (CDM) is responding to the Unilateral Administrative Order (UAO) dated August 27, 2009 regarding the Flint Street Landfill in Charlton, Massachusetts. Section IV - Disposition and Order requires the Town to complete several Action Items. Action Item 21 J requires the Town to submit a monthly status report, prepared by a registered professional engineer, by the 15th of each month that addresses Action Items A through H. This submittal responds to Action Item 21 J.

The attached table summarizes the status of each of the UAO required Action Items. Future progress reports will provide a status of the required UAO Action Items and the completion of the final landfill closure.

As noted on the table, construction and stabilization of the site is progressing and nearing completion.

Please do not hesitate to contact me at (617) 452-6589, if you have any questions or require further information.

Very truly yours,

Laura A. Bugay, P.E.
Camp Dresser & McKee Inc.

Attachments

cc: Board of Health, Town of Charlton
Robin Craver, Town of Charlton
Jim Philbrook, Town of Charlton
Chris Koehler, CDM
Bruce Haskell, CDM

Monthly Status Report
Summary of Required Tasks
for Unilateral Administrative Order[a]
Between the Town of Charlton and the Massachusetts
Department of Environmental Protection
As of December 15, 2009

Administrative Order Paragraph	*Description*	*Due Date[a]*	*Status*
Section IV. Paragraph 21A.	Submit name of closure completion Contractor.	September 11, 2009.	COMPLETED. Contract awarded on September 24, 2009. Notification in Correspondence dated October 8, 2009.
Section IV. Paragraph 21B.	Confirm that FML is temporarily anchored.	September 11, 2009.	IN PROGRESS. Anchor trench reconstruction is nearing completion. Anchoring of FML is part of the stabilization construction contract.
Section IV. Paragraph 21C.	Confirm stormwater has been re-directed to basin.	September 26, 2009.	IN PROGRESS. Preliminary site grading has directed stormwater to basin.
Section IV. Paragraph 21D.	Submit evaluation report.	September 3, 2009.	COMPLETED. Submitted on September 3, 2009.
Section IV. Paragraph 21E.	Submit FML installation information.	September 26, 2009.	COMPLETED. QA/QC information gathered was submitted September 26, 2009.
Section IV. Paragraph 21F.	Complete perimeter drainage system.	September 26, 2009.	IN PROGRESS. Perimeter drainage system is currently being constructed and is nearing completion.
Section IV. Paragraph 21G.	Provide cleanout and reconstruction plan for drainage basin.	November 25, 2009.	COMPLETED. Basin was cleaned out, re-graded, and seeded. Rip rap spillway and floc-logs were installed.
Section IV. Paragraph 21H.	Stabilize perimeter access road.	November 25, 2009.	IN PROGRESS. Perimeter access road is currently being graded and stabilized.
Section IV. Paragraph 21I.	Submit initial status report.	September 3, 2009.	COMPLETED. Submitted September 3, 2009.
Section IV. Paragraph 21J.	Submit monthly status reports.	Due the 15th of every month.	Next report to be submitted January 15, 2010.

[a]Due dates reflect Unilateral Administrative Order (UAO) received August 27, 2009.

One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: 617 452-6000
fax: 617 452-8000

March 9, 2010

Ms. Lynne Welsh
Section Chief - Solid Waste
Central Regional Office
Massachusetts Department of Environmental Protection
627 Main Street
Worcester, Massachusetts 01608

Subject: Request for Approval of Proposed Alternative Cap Cross-Section
Closure of Charlton Landfill

Dear Ms. Welsh:

As we discussed last week, Camp Dresser & McKee Inc. (CDM) has prepared the following letter to request approval from the Massachusetts Department of Environmental Protection (MassDEP) of an alternative landfill final cover system for the Charlton Landfill site. CDM requests that the proposed alternative cover system be approved under Section 19.113 of the MassDEP's Solid Waste Management Regulations (the Regulations, 310 CMR 19.000).

CDM has previously proposed an alternative final cover system in a letter report to MassDEP dated September 3, 2009 entitled "Landfill Closure Evaluation Report." MassDEP commented on this submittal in a letter dated November 6, 2009 and CDM submitted a response to the comments dated December 11, 2009 after a meeting in your office.

The cap cross-section proposed by CDM covers the existing flexible membrane liner (FML) with a geocomposite drainage net covered by a minimum one-foot thick layer of soils processed from the on-site stockpile and covered with a layer of topsoil. CDM has evaluated the existing FML and made provisions in the ongoing construction contract to have any visible repairs completed prior to placement of the geocomposite drainage net. Information on the repairs will be presented to MassDEP as part of the Certification Report.

CDM has also conducted a permeability test of the on-site soils proposed to be processed and re-used over the geocomposite. This single hydraulic conductivity test found that the permeability was approximately 3×10^{-4} cm/sec (copy attached). Based on our experience with evaluating alternative caps, the combination of the existing FML, even if it is assumed to be poorly installed, with the geocomposite drainage net and the overlying soils will have a net hydraulic conductivity that is less than the 1×10^{-5} cm/sec maximum outlined in Section 19.113 of the Regulations. Therefore, the proposed cap is equally effective in

minimizing infiltration into the underlying waste materials and will be protective of human health, safety and the environment.

Please do not hesitate to contact me at (617) 452-6541 if you have any questions or require anything further.

Very truly yours,

Bruce W. Haskell

Bruce W. Haskell, P.E.
Camp Dresser & McKee Inc.

Attachment

cc: Robin Craver, Charlton
Board of Health, Charlton
Laura Bugay, CDM

CDM

Geotechnical Engineering Laboratory

Hydraulic Conductivity Test on Granular Soils (ASTM D 2434

Client:	Town of Charlton
Project Name:	Landfill Closure
Project Location:	90 Flint Road
Project Number:	75398-72037
Sample Number:	#1
Sample Location:	#1
Sample Depth (ft):	--
Lab ID Number:	--

Tested By:	FY
Test Date:	10/6/2009
Permeant Fluid:	Tap Water

Sample Preparation Procedures:
Compacted to 90% maximum dry density

Sample Description:
silty sand with gravel

Sample Characteristics

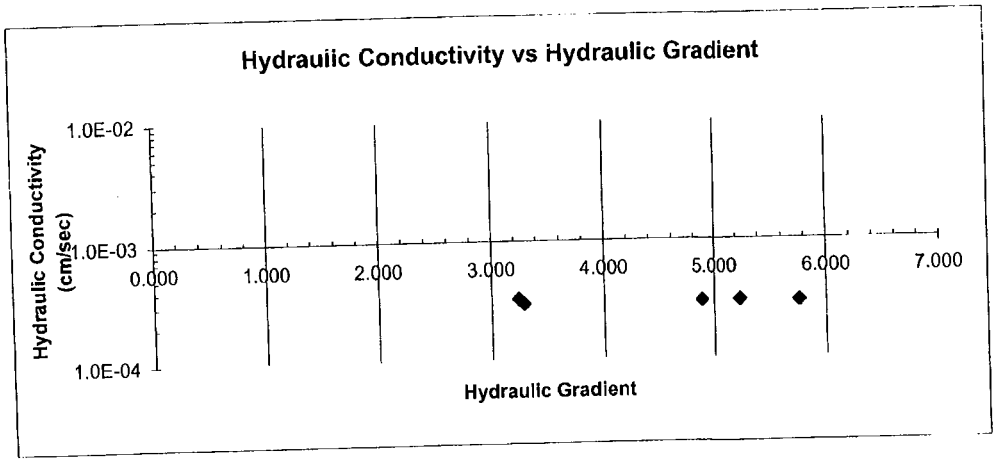
As received moisture content (%)	10.6
Moisture content at compaction (%)	10.2
Length of specimen (in)	7.00
Diameter of specimen (in)	4.37
Area (sqin)	14.96
Moist unit weight (pcf)	120.9
Dry unit weight (pcf)	109.7

Length between manometers(in)	4.52
% retained on 3/4-inch sieve:	0.0
Initial void ratio:	0.51
Specific gravity of solids (assumed):	2.65

Comments:

Test No.	Manometers Top h_1 (cm)	Manometers Bot h_2 (cm)	Head h (cm)	Flow Quantity Q (cm^3)	Elapsed Time t (sec)	Velocity Q/At (cm/sec)	Gradient h/L (no units)	Temp Correct. Factor	Hydraulic Cond. K @ 20 °C (cm/sec)
1	71.5	5.6	49.4	10	60.0	0.0017	5.8	1.0000	3.0E-04
2	41.9	4.1	37.8	5.6	60.0	0.0010	3.3	1.0000	3.0E-04
3	65.5	5.4	60.2	9.3	60.0	0.0016	5.2	1.0000	3.1E-04
4	41.5	4.3	37.3	6.2	60.0	0.0011	3.2	1.0000	3.3E-04
5	61.0	5.0	56.0	8.6	60.0	0.0015	4.9	1.0000	3.0E-04

Hydraulic Conductivity at 20°C= 3.1E-04 cm/sec



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

Ms. Robin L. Craver
Town of Charlton Administrator
37 Main Street
Charlton, MA 01507

Re: MassDEP Response to Landfill Closure Evaluation Report
Charlton - Flint Road Landfill Closure follow-up

Dear Ms. Craver:

This letter addresses the letter dated March 9, 2010 requesting approval for an alternative cap design for the Charlton Landfill closure.

The Massachusetts Department of Environmental Protection (the Department) issued a Unilateral Administrative Order on August 27, 2009 to the Town of Charlton directing them to complete the closure of its landfill at Flint Road. We received required information on September 3, 2009 report entitled *Landfill Closure Evaluation Report, Town of Charlton, Massachusetts* (the "Report") prepared by Camp, Dresser & McKee, Inc. (CDM) on behalf of the Town of Charlton (the "Town"). The Report was prepared in accordance with Item 21(D) of the August 27, 2009 Unilateral Administrative Order (UAO-CE-09-4005). The Department and responded by letter on November 6, 2009. At that time two issues were left undecided: the acceptance of the alternative cap design and the applicability of using the on-site soil in completing the closure of the landfill.

CDM provided additional information to MassDEP dated September 11, 2009 meeting the requirement of Item 21(B), confirming that the flexible membrane liner (FML) currently in-place over the grading/shaping and gas venting layers has been adequately anchored and stabilized to protect the FML from damage during completion of closure activities and December 11, 2009 to address the necessary assessment for the use of on-site soils.

Based on the information presented in the above referenced Report and the supplemental information provided on September 11, 2009, December 11, 2009 and on March 9, 2010, the Department approves the use of an alternative capping design per 310 CMR 19.113 *Alternative Landfill Final Cover System Design.* Additionally, the Department agrees that CDM, on behalf of the Town of Charlton, has provided sufficient results from site specific assessments that the alternative cap design would adequately protect the public health, safety and the environment. Please proceed with the next phase of closure.

If you have any further questions or comments regarding this matter, please me at (508) 849-4007.

Sincerely,

Date: 3/15/10

D. Lynne Welsh
Acting Section Chief
Solid Waste Management Group

Cc: Charlton Board of Health
Bruce Haskell, P.E., Camp, Dresser & McKee, Inc.

W:\SWM\Towns\CHARLTON\Landfill (BATG)\CDM alt cap req 030910 ltr 031510

JAN 0 4 2011

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the matter of:	)	
Town of Charlton	)	File No.: ACO-CE-10-6W003

ADMINISTRATIVE CONSENT ORDER
AND
NOTICE OF NONCOMPLIANCE

I. THE PARTIES

1. The Department of Environmental Protection ("Department" or "MassDEP") is a duly constituted agency of the Commonwealth of Massachusetts established pursuant to M.G.L. c. 21A, §7. MassDEP maintains its principal office at One Winter Street, Boston, Massachusetts 02108, and its Central Regional Office at 627 Main Street, Worcester, Massachusetts 01608.

2. The Town of Charlton ("Respondent") is a duly organized municipality established pursuant to the laws of the Commonwealth of Massachusetts, having a mailing address at 37 Main Street, Charlton, Massachusetts 01507.

II. PRELIMINARY STATEMENT

3. The Department has authority under M.G.L. c. 111, § 2C to issue orders to any person in violation of any law or regulation the Department is authorized to enforce. This Consent Order requires Respondent to take actions described herein to restore wetlands resources that were impacted by work associated with the incomplete closure activities at the Respondent's landfill, and the failure of BATG Environmental, Inc. to comply with wetlands restoration required in the Administrative Consent Order with Penalty (ACOP-CE-08-6W005) issued on November 25, 2008.

III. STATEMENT OF FACTS AND LAW

4. The Department is responsible for the implementation and enforcement of M.G.L. c. 131, §40 and Wetlands Protection Regulations at 310 CMR 10.00; and, M.G.L. c. 111, §§ 150A and 150A1/2, the Solid Waste Management Regulations at 310 CMR 19.000, and the Site Assignment Regulations at 310 CMR 16.00.

5. The following facts and allegations have led MassDEP to issue this Consent Order:

A. Respondent owns an inactive, unlined, and uncapped municipal solid waste landfill (the "Landfill") located off Flint Road in Charlton, Massachusetts (the "Site"). Respondent used the Landfill, which covers approximately 9.5 acres, to dispose of municipal solid waste from 1978 until February 1992. The Landfill is subject to the landfill closure and post-closure requirements set forth in the Department's Solid Waste regulations at 310 CMR 19.000 and the Department's Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites dated July 6, 2001, (the "Revised Guidelines").

B. In December 2004, Respondent submitted an application to the Department for a Corrective Action Design permit (the "CAD Permit") to close the Landfill in accordance with the Solid Waste regulations and the Revised Guidelines. At about the same time, on December 15, 2004, Respondent entered into a contract with BATG Environmental, Inc. ("BATG") to oversee all construction activities associated with the final closure and capping of the Landfill.

C. Because of technical deficiencies in the CAD Permit application, Respondent was given until October 28, 2005 to submit additional information to the Department to support the Permit application. By letter dated October 28, 2005, Respondent authorized BATG to implement corrective actions at the Landfill, even though the CAD Permit application was still pending.

D. On November 16, 2005, upon discovering that BATG was hauling truckloads of solid waste and soils to the Site and depositing them on top of the Landfill, MassDEP issued a Unilateral Administrative Order (UAO-CE-05-4001) requiring BATG to cease and desist from undertaking any corrective action at the Landfill until the Department issued the CAD Permit to authorize the work. The solid waste and soils brought to the Landfill were not of the type approved in the Revised Guidelines for use in closure activities, and included processed construction/demolition fine materials ("C&D fines").

E. On March 20, 2006, Respondent and the Department entered into an Administrative Consent Order and Notice of Noncompliance that required Respondent to submit a revised CAD Permit application, to establish a financial assurance mechanism ("FAM") to fund the complete closure of the Landfill, and to complete the corrective actions approved by the Department by December 31, 2007.

F. On June 15, 2006, Respondent executed a Contract Change Order with BATG, providing that BATG would fund the FAM for Respondent. Respondent elected to establish an Enterprise Fund as its FAM, pursuant to the Solid Waste Management Regulations at 310 CMR 19.051(12) (b).

G. On June 16, 2006, the Department issued the CAD Permit that authorized Respondent, and BATG as the operator, to import 115,000 cubic yards of shaping and grading materials to the Site to close the Landfill. The CAD Permit established the design

requirements for construction of gas venting, drainage, and vegetative support layers on the Landfill; established a deadline of 30 months to complete closure activities; and required Respondent to establish the FAM before beginning construction activities. The CAD Permit allowed Respondent to use the 12,000 cubic yards of unauthorized material that BATG had already brought to the Site, but only if the C&D fines were mixed with other materials before being used on the Landfill. The CAD Permit also prohibits the stockpiling of shaping and grading materials at the Site.

H. On January 29, 2007, MassDEP and BATG entered into an Administrative Consent Order with Penalty and Notice of Noncompliance (ACOP-CE-06-9035-46A) (the "2007 ACOP") to resolve the enforcement action against BATG for violations of Solid Waste, Wetlands and Industrial Wastewater regulations at the Landfill observed by MassDEP on November 16, 2005. The 2007 ACOP required BATG to pay a penalty of $33,620.00, of which $17,000.00 was suspended, and to mix the C&D fines with appropriate materials before using them for closure activities. In paragraph 18.C of the 2007 ACOP, BATG agreed to comply with the CAD Permit during all construction activities at the Landfill.

I. In August 2007, BATG again brought unauthorized materials to the Landfill to be used as shaping and grading material. MassDEP issued another Unilateral Administrative Order to BATG on September 7, 2007, (UAO-CE-07-4001) for BATG's use of materials not authorized in the CAD Permit, and for stockpiling the materials at the Site, in violation of the CAD Permit. The Department directed BATG to remove all of the unauthorized material from the Site, and to provide proof of its legal disposal or reuse.

J. On January 18, 2008, the Department issued a third Unilateral Administrative Order to BATG (UAO-CE-08-6W001) for violations of the Wetlands Protection Act, G.L. c. 131, §40 and its implementing regulations at 310 CMR 10.00. Specifically, during an inspection on January 11, 2008, the Department observed the discharge of silt-laden runoff from unstable soils from the landfill capping activities that altered approximately ½ acre of bordering vegetated wetlands and two intermittent streams. The Department directed BATG to cease the discharge of silt-laden runoff, and to implement erosion controls at the Site.

K. On March 31, 2008, the Department issued a fourth Unilateral Administrative Order (UAO-CE-08-4004) to BATG for its failure to provide the certification required under the CAD Permit that the shaping and grading materials had been placed at the Landfill in accordance with the requirements of the CAD Permit, and for failing to fully fund the FAM, as required in paragraph 18.B of the 2007 ACOP. The Department directed BATG to cease accepting soils for shaping and grading at the Landfill; to provide certain analyses of the soils used for the gas venting layer; to complete the shaping and grading and provide the required certification to the Department; and to complete funding of the FAM. The Department also established new deadlines for the remaining construction activities related to the closure, superseding the deadlines in the 2007 ACOP.

L. On June 24, 2008, the Department issued a fifth Unilateral Administrative Order to BATG (UAO-CE-08-4009), which superseded the deadlines established in the prior Order, UAO-CE-08-4004.

M. On November 25, 2008, the Department and BATG entered into another Administrative Consent Order with Penalty and Notice of Noncompliance (ACOP-CE-08-6W005) (the "2008 ACOP"), addressing the violations of the Wetlands Protection Act that had occurred at the site. The ACOP cited discharge of silt-laden runoff and erodible soils from the landfill capping activities that resulted in violation of 310 CMR 10.55 and 10.54(4) as well as 314 CMR 9.00 and 4.00. The ACOP also cited the lack of effective erosion controls in violation of the Superseding Order of Conditions issued to BATG. In the 2008 ACOP, BATG agreed to implement an Erosion Control Plan and a Wetlands Restoration Plan to correct the violations and to prevent future alterations of wetland areas. BATG also agreed to pay a $20,000.00 penalty, with an additional $5,000.00 suspended pending compliance with the 2008 ACOP.

N. On April 27, 2009, MassDEP personnel and the Charlton Board of Health Agent met at the Landfill and observed approximately fifteen piles of material stockpiled at the entrance of the Landfill. The material consisted of hard, clay-like mineral material with approximately five percent of the material consisting of construction and demolition waste. In addition, there was a *de minimus* amount of solid waste mixed in. The CAD Permit prohibits stockpiling of materials at the Site.

O. On May 29, 2009, MassDEP personnel conducted a site visit at the Landfill and observed that the previous piles of material had been flattened, and that three new large piles of material were stockpiled at the entrance of the Landfill on top of the previously flattened material. The new material consisted primarily of the same clay-like mineral material as observed during the April 27, 2009 inspection, with a small amount of humic material. Once again, MassDEP personnel observed that approximately five percent of the material consisted of construction and demolition waste, along with a *de minimus* amount of solid waste mixed with the material. In addition, MassDEP observed that there had been no substantial work undertaken at the Landfill since the flexible membrane liner ("FML") was installed in 2008. The FML has remained exposed to the elements for several months, and is therefore at risk of damage or deterioration.

P. Respondent has failed to comply with the terms and conditions of the CAD Permit, in violation of 310 CMR 19.081(1). Specifically, Respondent has failed to complete the capping and closure of the Landfill within 30 months of the issuance of the CAD Permit. BATG, as Respondent's contractor, has failed to comply with the extended deadlines for the closure activities contained in UAO-CE-08-4009, which required certification that all construction activity has been completed at the Landfill in accordance with the CAD Permit by October 30, 2008. The Department acknowledges that Respondent's ability to complete the work required by the CAD Permit has been affected by the repeated and continued non-compliance of BATG, its contractor, as described above.

Q. On August 27, 2009 the Department issued a Unilateral Administrative Order (UAO-CE-09-4005) to Respondent with new deadlines to complete the work required by the CAD Permit.

R. On July 12, 2010, Respondent met with MassDEP personnel to discuss, among other issues, the outstanding wetland restoration activities necessary to comply with the 2008 ACOP described in paragraph M above.

S. On September 9, 2010, Respondent submitted a Wetlands Restoration Plan for the Site.

IV. DISPOSITION AND ORDER

6. The parties have agreed to enter into this Consent Order because they agree that it is in their own interests, and in the public interest, to proceed promptly with the actions called for herein rather than to expend additional time and resources litigating the matters set forth above. Respondent enters into this Consent Order without admitting or denying the facts or allegations set forth herein. However, Respondent agrees not to contest such facts and allegations for purposes of the issuance or enforcement of this Consent Order. For the reasons set forth above, MassDEP hereby issues, and Respondent hereby consents to, this Order:

A. Respondent will commence the removal activities identified in the "WETLANDS RESTORATION PLAN" submitted by Camp Dresser & McKee Inc. stamped on 9/21/10 by Bruce Haskell, P.E. sheets C-3, C-4, D-1 and D-2, by no later than May 1, 2011.

B. Respondent will implement effective erosion controls at all times as depicted and described in the "WETLANDS RESTORATION PLAN" identified in item #22 above, and prevent any further discharges of fill or high turbidity to wetlands resource areas during construction, replication or restoration work.

C. Respondent will submit a work progress report to the MassDEP, prepared by a Professional Engineer or other professional competent in wetlands restoration, by June 30, 2011, and a follow up progress report by August 30, 2011.

D. Respondent will complete all work including the wetlands planting details as described on Sheet C-4 of the "WETLANDS RESTORATION PLAN" by no later than October 30, 2011.

7. Except as otherwise provided, all notices, submittals and other communications required by this Consent Order shall be directed to:

Philip Nadeau, Wetlands Section Chief
Department of Environmental Protection
Central Regional Office
627 Main Street
Worcester, Massachusetts 01608

Such notices, submittals and other communications shall be considered delivered by Respondent upon receipt by MassDEP.

8. Actions required by this Consent Order shall be taken in accordance with all applicable federal, state, and local laws, regulations and approvals. This Consent Order shall not be construed as, nor operate as, relieving Respondent or any other person of the necessity of complying with all applicable federal, state, and local laws, regulations and approvals.

9. For purposes of M.G.L. c. 21A, § 16 and 310 CMR 5.00, this Consent Order shall also serve as a Notice of Noncompliance for Respondent's noncompliance with the requirements cited in Part II above. MassDEP hereby determines, and Respondent hereby agrees, that the deadlines set forth above constitute reasonable periods of time for Respondent to take the actions described.

10. Force Majeure

A. MassDEP agrees to extend the time for performance of any requirement of this Consent Order if MassDEP determines that such failure to perform is caused by a Force Majeure event. The failure to perform a requirement of this Consent Order shall be considered to have been caused by a Force Majeure event if the following criteria are met: (1) an event delays performance of a requirement of this Consent Order beyond the deadline established herein; (2) such event is beyond the control and without the fault of Respondent and Respondent's employees, agents, consultants, and contractors; and (3) such delay could not have been prevented, avoided or minimized by the exercise of due care by Respondent or Respondent's employees, agents, consultants, and contractors.

B. Financial inability and unanticipated or increased costs and expenses associated with the performance of any requirement of this Consent Order shall not be considered a Force Majeure Event.

C. If any event occurs that delays or may delay the performance of any requirement of this Consent Order, Respondent shall immediately, but in no event later than 5 days after obtaining knowledge of such event, notify MassDEP in writing of such event. The notice shall describe in detail: (i) the reason for and the anticipated length of the delay or potential delay; (ii) the measures taken and to be taken to prevent, avoid, or minimize the delay or potential delay; and (iii) the timetable for taking such measures. If Respondent intends to attribute such delay or potential delay to a Force Majeure event, such notice shall also include the rationale for attributing such delay or potential delay to a Force Majeure event and shall include all available documentation supporting a claim of Force Majeure for the event. Failure to comply with the notice requirements set forth herein shall constitute a waiver of Respondent's right to request an extension based on the event.

D. If MassDEP determines that Respondent's failure to perform a requirement of this Consent Order is caused by a Force Majeure event, and Respondent otherwise complies with the notice provisions set forth in paragraph C above, MassDEP agrees to extend in writing the

time for performance of such requirement. The duration of this extension shall be equal to the period of time the failure to perform is caused by the Force Majeure event. No extension shall be provided for any period of time that Respondent's failure to perform could have been prevented, avoided or minimized by the exercise of due care. No penalties shall become due for Respondent's failure to perform a requirement of this Consent Order during the extension of the time for performance resulting from a Force Majeure event.

E. A delay in the performance of a requirement of this Consent Order caused by a Force Majeure event shall not, of itself, extend the time for performance of any other requirement of this Consent Order.

11. Respondent understands, and hereby waives, its right to an adjudicatory hearing before MassDEP on, and judicial review of, the issuance and terms of this Consent Order and to notice of any such rights of review. This waiver does not extend to any other order issued by the MassDEP.

12. This Consent Order may be modified only by written agreement of the parties hereto.

13. The provisions of this Consent Order are severable, and if any provision of this Consent Order or the application thereof is held invalid, such invalidity shall not affect the validity of other provisions of this Consent Order, or the application of such other provisions, which can be given effect without the invalid provision or application, provided however, that MassDEP shall have the discretion to void this Consent Order in the event of any such invalidity.

14. Nothing in this Consent Order shall be construed or operate as barring, diminishing, adjudicating or in any way affecting (i) any legal or equitable right of MassDEP to issue any additional order or to seek any other relief with respect to the subject matter covered by this Consent Order, or (ii) any legal or equitable right of MassDEP to pursue any other claim, action, suit, cause of action, or demand which MassDEP may have with respect to the subject matter covered by this Consent Order, including, without limitation, any action to enforce this Consent Order in an administrative or judicial proceeding.

15. This Consent Order shall not be construed or operate as barring, diminishing, adjudicating, or in any way affecting, any legal or equitable right of MassDEP or Respondent with respect to any subject matter not covered by this Consent Order.

16. This Consent Order shall be binding upon Respondent's successors and assigns. Respondent shall not violate this Consent Order and shall not allow or suffer Respondent's employees, agents, contractors or consultants to violate this Consent Order. Until Respondent has fully complied with this Consent Order, Respondent shall provide a copy of this Consent Order to each successor or assignee at such time that any succession or assignment occurs.

17. Respondent shall pay stipulated civil administrative penalties to the Commonwealth in accordance with the following schedule if Respondent violates any provision of this Consent Order:

For each day, or portion thereof, of each violation, Respondent shall pay stipulated civil administrative penalties in the following amounts:

Period of Violation	Penalty per day
1st through 15th days	$200.00 per day
16th through 30th days	$300.00 per day
31st day and thereafter	$1,000.00 per day

Stipulated civil administrative penalties shall begin to accrue on the day a violation occurs and shall continue to accrue until the day Respondent corrects the violation or completes performance, whichever is applicable. Stipulated civil administrative penalties shall accrue regardless of whether MassDEP has notified Respondent of a violation or act of noncompliance. All stipulated civil administrative penalties accruing under this Consent Order shall be paid within thirty (30) days of the date MassDEP issues Respondent a written demand for payment. If simultaneous violations occur, separate penalties shall accrue for separate violations of this Consent Order. The payment of stipulated civil administrative penalties shall not alter in any way Respondent's obligation to complete performance as required by this Consent Order. MassDEP reserves its right to elect to pursue alternative remedies and alternative civil and criminal penalties which may be available by reason of Respondent's failure to comply with the requirements of this Consent Order. In the event MassDEP collects alternative civil administrative penalties, Respondent shall not be required to pay stipulated civil administrative penalties pursuant to this Consent Order for the same violations.

Respondent reserves whatever rights it may have to contest MassDEP's determination that Respondent failed to comply with the Consent Order and/or to contest the accuracy of MassDEP's calculation of the amount of the stipulated civil administrative penalty. Upon exhaustion of such rights, if any, Respondent agrees to assent to the entry of a court judgment if such court judgment is necessary to execute a claim for stipulated penalties under this Consent Order.

18. Failure on the part of MassDEP to complain of any action or inaction on the part of Respondent shall not constitute a waiver by MassDEP of any of its rights under this Consent Order. Further, no waiver by MassDEP of any provision of this Consent Order shall be construed as a waiver of any other provision of this Consent Order.

19. Respondent agrees to provide MassDEP, and MassDEP's employees, representatives and contractors, access at all reasonable times to the Site for purposes of conducting any activity related to its oversight of this Consent Order. Notwithstanding any provision of this Consent Order, MassDEP retains all of its access authorities and rights under applicable state and federal law.

[No additional text appears on this page]

20. The undersigned certify that they are fully authorized to enter into the terms and conditions of this Consent Order and to legally bind the party on whose behalf they are signing this Consent Order.

21. This Consent Order shall become effective on the date that it is executed by MassDEP.

Consented To:

TOWN OF CHARLTON

By: _____
Robin L. Craver
Town Administrator
37 Main Street
Charlton, MA 01507

Federal Employer Identification No.: 046-001-109

Date: 1/4/11

Issued By:

DEPARTMENT OF ENVIRONMENTAL PROTECTION

By: _____
Martin Suuberg, Regional Director
Central Regional Office
627 Main Street
Worcester, MA 01608

Date: _____

CDM
One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: +1 617 452-6000
fax: +1 617 452-8000

June 23, 2011

Mr. Philip Nadeau, Wetlands Section Chief
Department of Environmental Protection
Central Regional Office
627 Main Street
Worcester, Massachusetts 01608

Subject: Administrative Consent Order (ACO-CE-10-6W003)
Flint Road Landfill, Wetland Restoration and Replication
Charlton, Massachusetts
June 2011 Status Report

Dear Mr. Nadeau:

On behalf of the Town of Charlton (the Town), Camp Dresser & McKee, Inc. (CDM) is responding to the Administrative Consent Order (ACO) dated August 27, 2009 regarding the wetland restoration and replication at the Flint Street Landfill in Charlton, Massachusetts. Section IV - Disposition and Order requires the Town to submit a progress report of the work prepared by a professional engineer by June 30, 2011.

As you may be aware the wetland restoration and replication work identified in the ACO is part of the landfill closure construction contract. Construction commenced on March 28, 2011 with the mobilization of the contractor and installation of the erosion control barriers as shown on the Wetland Restoration and Replication Plans.

The Contractor began the excavation of sediments from wetland restoration area #2, located in the southwest corner of the site, this week. Plantings and seeding in accordance with the approved restoration plans will be completed in the near future. Work in the wetland restoration area #1 has not yet begun.

The Contractor chose to build the final toe of slope swale first for added protection of the wetland area during placement of cover soils and waited through the rainy season where potential erosion and sedimentation impacts were the greatest to the wetland before beginning the restoration work. The wetland restoration and replication work is on schedule to be completed by October 30, 2011 as required per the ACO.

As required in the ACO, another progress report will be submitted by August 30, 2011.

We are aware that MassDEP has been on-site. If you have any questions, require further information, or if there are any concerns with construction, please do not hesitate to contact me at (617) 452-6589.

Very truly yours,

Laura A. Bugay, P.E.
Camp Dresser & McKee Inc.

cc: D. Lynne Welsh, MassDEP
Board of Health, Town of Charlton
Robin Craver, Town of Charlton
Todd Girard, Charlton Conservation Commission
Bruce Haskell, CDM
CDM File: 72037/3.7.3

One Cambridge Place, 50 Hampshire Street
Cambridge, Massachusetts 02139
tel: +1 617 452-6000
fax: +1 617 452-8000

August 30, 2011

Mr. Philip Nadeau, Wetlands Section Chief
Department of Environmental Protection
Central Regional Office
627 Main Street
Worcester, Massachusetts 01608

Subject: Administrative Consent Order (ACO-CE-10-6W003)
Flint Road Landfill, Wetland Restoration and Replication
Charlton, Massachusetts
August 2011 Status Report

Dear Mr. Nadeau:

On behalf of the Town of Charlton (the Town), Camp Dresser & McKee, Inc. (CDM) is responding to the Administrative Consent Order (ACO) dated August 27, 2009 regarding the wetland restoration and replication at the Flint Street Landfill in Charlton, Massachusetts. Section IV - Disposition and Order requires the Town to submit a progress report of the work prepared by a professional engineer by August 30, 2011.

As indicated in the previous June 2011 progress report, the wetland restoration and replication work identified in the ACO is part of the landfill closure construction contract. Excavation of sediments from wetland restoration area #2, located in the southwest corner of the site was completed in early July 2011. This area was restored with organic rich topsoil, seeded with a specific wetland seed mixture and planted with vegetation as specified in the design.

The Contractor began the construction of the wetland replication area located in the southeastern corner of the site in August 2011. This replication area was also restored with organic rich topsoil, seeded with a specific wetland seed mixture and planted with vegetation as specified in the design. A triple layer of silt fence was installed at the connection location of this new replication area to the existing wetland to minimize siltation until vegetation can be established.

Work in the wetland restoration area #1 located adjacent to Flint Road has not yet begun due to the recent completion of the replication area. Work will commence following hurricane

related repairs and re-seeding and stabilization of the replication area to minimize potential sedimentation impacts to the restoration area.

The wetland restoration and replication work is on schedule to be completed by October 30, 2011 as required per the ACO.

Please note that the site managed the stormwater from Hurricane Irene extremely well and no impacts to the downgradient wetlands were observed.

This is the final progress report required per the ACO.

We are aware that MassDEP has been on-site throughout construction. If you have any questions, require further information, or if there are any concerns with construction, please do not hesitate to contact me at (617) 452-6589.

Very truly yours,

Laura A. Bugay, P.E.
Camp Dresser & McKee Inc.

cc: D. Lynne Welsh, MassDEP
Board of Health, Town of Charlton
Robin Craver, Town of Charlton
Todd Girard, Charlton Conservation Commission
Bruce Haskell, CDM
CDM File: 72037/3.7.3

CDM Smith

50 Hampshire Street
Cambridge, Massachusetts 02139
tel: +1 617 452-6000
fax: +1 617 452-8000
cdmsmith.com

September 13, 2012

Mr. Philip Nadeau, Wetlands Section Chief
Department of Environmental Protection
Central Regional Office
627 Main Street
Worcester, Massachusetts 01608

Subject: Administrative Consent Order (ACO-CE-10-6W003)
Flint Road Landfill, Wetland Restoration and Replication
Charlton, Massachusetts
Request for ACO Completion Concurrence

Dear Mr. Nadeau:

On behalf of the Town of Charlton (the Town), CDM Smith Inc. (CDM Smith) is requesting completion concurrence and close out for the work required under the subject Administrative Consent Order (ACO) dated August 27, 2009. The work associated with the wetland restoration and replication at the Flint Road Landfill in Charlton, Massachusetts is complete.

The requirements set forth in Section IV-Disposition and Order of the ACO included the following:

1. The Town to commence removal activities identified in the "Wetlands Restoration Plan" submitted by Camp Dresser & McKee... no later than May 1, 2011.

   The June 23, 2011 progress report submitted to the Department identified that the Contractor had mobilized and began work at the site on March 28, 2011.

2. The Town is to implement effective erosion controls at all times as depicted and described in the "Wetlands Restoration Plan", and prevent any further discharges of fill or high turbidity to wetlands resource areas during construction, replication or restoration work.

   The contractor installed and maintained effective erosion control barriers throughout landfill closure completion construction, wetland replication and wetland restoration work. No fill or high turbidity was discharged to the wetlands during any construction activities at the site.

3. The Town is to submit a progress report of the work prepared by a professional engineer by June 30, 2011 and a follow-up progress report by August 30, 2011.

   These progress reports were submitted to the Department in correspondence dated June 23, 2011 and August 30, 2011, respectively.

4. The Town will complete all work including wetland plantings... no later than October 30, 2011.

   The Contractor completed all related work in early October 2011 as observed by Phil Nadeau, MassDEP, during a site inspection conducted on October 18, 2011.

A final site walk was conducted on August 29, 2012 by Phil Nadeau (MassDEP) and Laura Bugay (CDM Smith) to observe the condition of plantings and measure restoration and replication areas. The plantings were observed to be healthy and in good condition and the landfill site was observed to be well vegetated and stable. The following table summarizes the wetland replication and restoration design areas as compared to the confirmatory measured area estimated in the field and the surveyed area provided by the Contractor.

Table 1- Wetland Restoration and Replication Area Summary

	Design/Required Area	**Field Estimated Area**	**Surveyed Area**
Wetland Restoration Areas			
Area 1	2,500 sf	NA	2,642
Area 2	5,600 sf	7,417	6,017
Wetland Replication Area			
Area 1	15,000 sf	13,400-14,900 sf	15,233- 16,973 sf

The field measurements for the replication area were lower than the area constructed as calculated per the survey (attached). This is most likely due to the irregular shape of the replication area and the general estimation of size in the field. The areas provided in the table above calculated from the survey record drawings represent the 729 (15,233 sf) and 730 (16,973 sf) elevational contours. The replication

area was designed to fulfill the replication area at the 730 contour based upon existing wetland site grades. Restoration Area #1 located to the southeast of the site along Flint Road could not be measured in the field due to the irregular area of restoration. Restoration within Restoration Area #2 was greater than required as confirmed by both the survey and field measurements. The field measurements appear to be greater than the surveyed area which can be attributed to the fact that the wetland restoration area has naturalized well and the limits of restorative work are no longer well defined.

Overall, the site as a whole is vegetated and is stabilized. At this time, all wetland replication and restoration work is complete, including the establishment of plantings. Therefore, CDM Smith is requesting that the work stipulated in the ACO be determined complete.

If you have any questions, require further information, please do not hesitate to contact me at (617) 452-6589.

Very truly yours,

Laura A. Bugay, P.E.
CDM Smith Inc.

Attachment

cc: James McQuade, MassDEP
Board of Health, Town of Charlton
Robin Craver, Town of Charlton
Todd Girard, Charlton Conservation Commission
Bruce Haskell, CDM Smith
CDM File: 72037/3.7.3

LEGEND

- APPROXIMATE PROPERTY LINE
- EASEMENT
- TREE LINE
- 682 — INTERMEDIATE CONTOURS
- 680 — INDEX CONTOURS
- GRAVEL DRIVE
- RIP-RAP
- CONIFER SAPLING
- DECIDUOUS SAPLING
- SWEET PEPPER BUSH
- LANDSCAPE BOULDER
- MW 2DR — MONITORING WELL
- GP-5 — 1" PVC RISER
- 15" PCC INVERT
- MH
- TEMP. BENCHMARK
- IRON PIPE FOUND

N

NAD-83

N/F
NANCY L JACKSON
BK 15671, PG 330
51-B-3.1

N/F
FRANCO & LINA D'ANNUNZIO
BK 33821, PG 319
51-B-3

N/F
MICHAEL D & ELIZABETH L RESENER
BK 35032, PG 177
51-B-5

N/F
TOWN OF CHARLTON
BK 18612, PG 296
PLAN BK 649, PLAN 27
51-B-4.1

N/F
TOWN OF CHARLTON
BK 18612, PG 296
51-B-4

N/F
TOWN OF CHARLTON
BK 18612, PG 296
PLAN BK 649, PLAN 27
51-B-4.1

MW 1SR

MW 2DR
MW 2DR

MW-3DR

MW 3S

GP-5

VENT 6"PVC

15"CCP INV=665.42
15"CCP INV=660.96
15"CCP INV=664.30
15"CCP INV=684.89
15"CCP INV=685.70
15"CCP INV=708.28
15"CCP INV=708.82
15"CCP INV=728.95
15"CCP INV=728.94
15"CCP INV=745.87
15"CCP INV=746.48
15"CCP INV=756.57
15"CCP INV=757.73

STANDARD OIL CO. OF NEW YORK
30 FT. WIDE EASEMENT
BK 2640, PG 94
PLAN BK 649-PLAN 27

CONC. PAD W/ FUEL TANK

IRON PIPE SET 8" DEEP

TBM DRIVEN SPIKE
EL=745.30

JERSEY BARRIERS

BIT

IP

RESTORATION AREA
#2: 6,017 SF

RESTORATION AREA
#1: 2,642 SF

REPLICATION AREA
#1: 16,973 SF
(EL. 730)

TOWN FARM ROAD

FLINT ROAD

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

LOCUS MAP
(N.T.S.)

E HALL ROAD
BURLINGAME ROAD
HILL ROAD
ROUTE 31
TOWN FARM ROAD
GAS LINE EASEMENT
SITE
POST PLANT
TENSION ELECTRIC
DRESSER
BURLINGAME

PLAN REFERENCES

1. PLAN BK 649, PLAN 27, WORCESTER DISTRICT REGISTRY OF DEEDS.

UTILITY STATEMENTS

THE LOCATION OF THE UTILITIES AS SHOWN HEREON HAVE BEEN COMPILED FROM VISIBLE STRUCTURES ONLY. THE ACTUAL LOCATION OF ALL UTILITIES AND UNDERGROUND STRUCTURES SHALL BE CONSIDERED APPROXIMATE AND SHALL BE VERIFIED BY THE OWNER PRIOR TO ANY CONSTRUCTION. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICES OR ABANDONED.

NOTES

1. THIS PLAN WAS PREPARED FROM AN ACTUAL ON THE GROUND FIELD SURVEY CONDUCTED BY WSP SELLS ON SEPTEMBER 27, 2011, SEPTEMBER 28, 2011 AND OCTOBER 5, 2011.

2. THE HORIZONTAL DATUM SHOWN HEREON REFRENCES THE MASSACHUSETTS STATE COORDINATE SYSTEM, MAINLAND ZONE, NAD 83.

3. THE VERTICAL DATUM SHOWN HEREON REFERENCES PREVIOUS PLANS BY WSP-SELLS, SEE LEVEL RUNS IN FIELD BOOK CHA21/120 AND CHA32/102. GPS POINTS ELEVATIONS WERE FIELD MEASURED USING THE LEICA VRS MAINTAINED BY MAINE TECHNICAL SOURCE AS NAVD88 AND ADJUSTED TO FIT EXISTING CONTROL USING THE FORMULA NAVD88 −0.38' = PROJECT ELEVATION.

CHARLTON LANDFILL

FLINT ROAD
CHARLTON, MASSACHUSETTS
PREPARED FOR
J. BATES & SONS

WSP • SELLS
Transportation & Infrastructure
9 Trolley Crossing Road • Charlton, MA 01507 • 508.248.1970
155 Main Dunstable Rd. Suites 120 & 125 • Nashua, NH 03060 • 603.595.7900
www.wspsells.com

Drawn By RBP		Date	Job No.
Surveyed By JO/JL		OCTOBER 7, 2011	113137
Checked By DJH		Scale	Sheet No.
Book No. CHA-33		1" = 40'	1 OF 1

113137-1-JBATES.dwg

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Central Regional Office • 627 Main Street, Worcester MA 01608 • 508-792-7650

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

RICHARD K. SULLIVAN JR.
Secretary

KENNETH L. KIMMELL
Commissioner

October 1, 2012

Robin L. Craver
Town Administrator
37 Main Street
Charlton, MA 01507

Re: Wetlands - Compliance Letter
Administrative Consent Order
ACO-CE-10-6W003

Dear Ms. Craver:

On August 29, 2012, on behalf of the Massachusetts Department of Environmental Protection, I met with representatives of Town of Charlton and conducted a final compliance inspection with Laura Bugay of CDM Smith Inc. pertaining to the wetlands restoration required at the Charlton Landfill site located off Flint Road in the town of Charlton.

The results of that inspection and meeting are outlined in a letter to me from CDM Smith dated September 13, 2012. In summary the Department finds that the total combination of restoration and replication of wetlands accomplished at the site was greater than that which was required in the Order and that the entire site was very stabile.

Therefore all the requirements of ACO-CE-10-6W003 have been complied with and there are no further obligations on your part regarding that Consent Order.

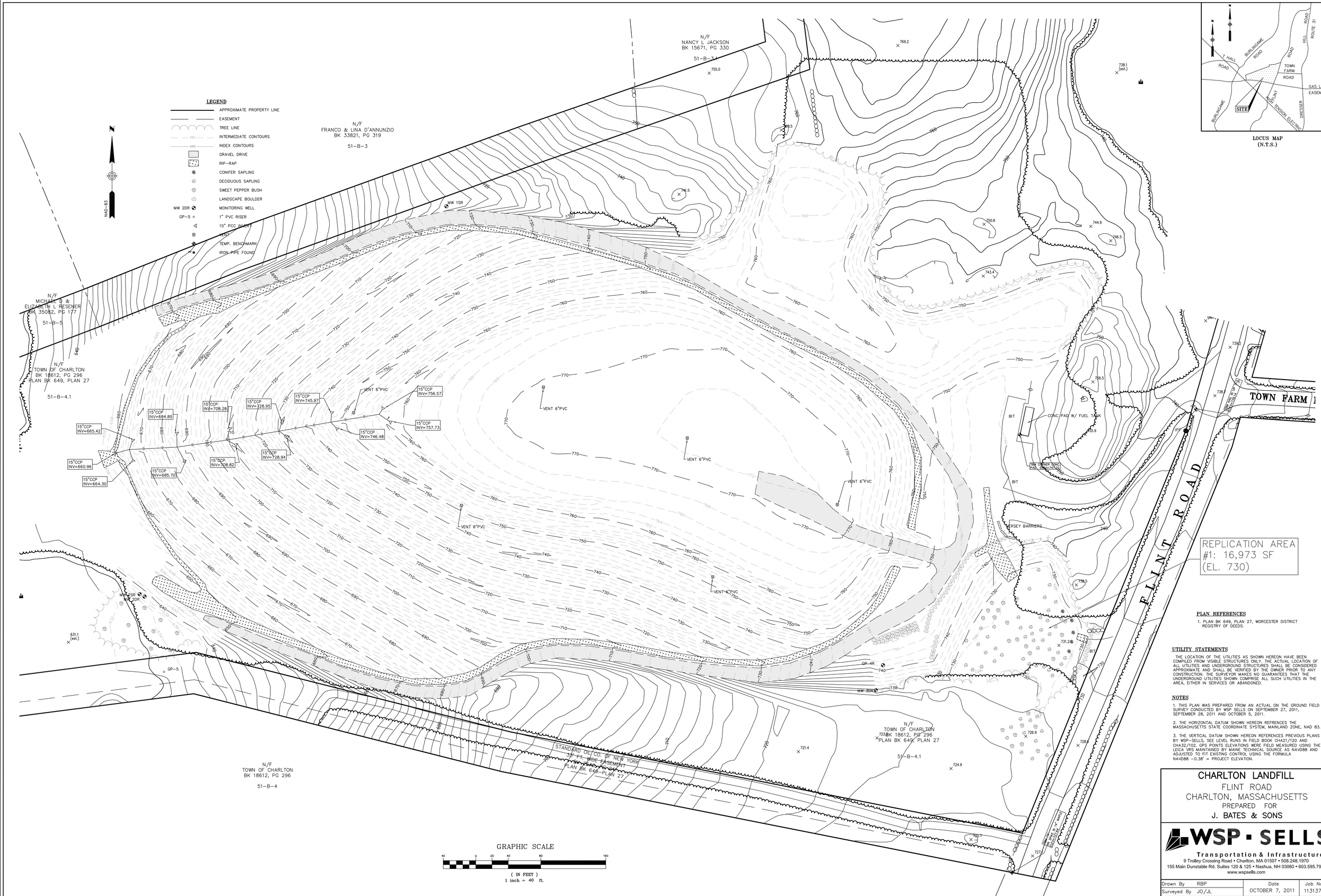
If there are any further questions regarding this matter, please call me at (508) 767-2728.

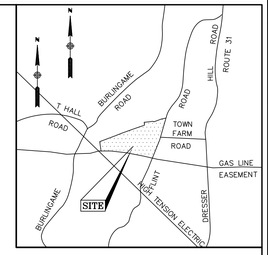
Sincerely,

Philip Nadeau, Chief
Wetlands Protection Program
Bureau of Resource Protection

cc: CDM
James McQuade, Mass-DEP
Charlton Conservation Commission
Board of Health, Charlton

Appendix B
Record Drawings





LOCUS MAP
(N.T.S.)

REPLICATION AREA
#1: 16,973 SF
(EL. 730)

PLAN REFERENCES

1. PLAN BK 649, PLAN 27, WORCESTER DISTRICT REGISTRY OF DEEDS.

UTILITY STATEMENTS

THE LOCATION OF THE UTILITIES AS SHOWN HEREON HAVE BEEN COMPILED FROM VISIBLE STRUCTURES ONLY. THE ACTUAL LOCATION OF ALL UTILITIES AND UNDERGROUND STRUCTURES SHALL BE CONSIDERED APPROXIMATE AND SHALL BE VERIFIED BY THE OWNER PRIOR TO ANY CONSTRUCTION. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICES OR ABANDONED.

NOTES

1. THIS PLAN WAS PREPARED FROM AN ACTUAL ON THE GROUND FIELD SURVEY CONDUCTED BY WSP SELLS ON SEPTEMBER 27, 2011, SEPTEMBER 28, 2011 AND OCTOBER 5, 2011.

2. THE HORIZONTAL DATUM SHOWN HEREON REFRENCES THE MASSACHUSETTS STATE COORDINATE SYSTEM, MAINLAND ZONE, NAD 83.

3. THE VERTICAL DATUM SHOWN HEREON REFERENCES PREVIOUS PLANS BY WSP-SELLS, SEE LEVEL RUNS IN FIELD BOOK CHA21/120 AND CHA32/102. GPS POINTS ELEVATIONS WERE FIELD MEASURED USING THE LEICA VRS MAINTAINED BY MAINE TECHNICAL SOURCE AS NAVD88 AND ADJUSTED TO FIT EXISTING CONTROL USING THE FORMULA NAVD88 −0.38' = PROJECT ELEVATION.

CHARLTON LANDFILL

FLINT ROAD
CHARLTON, MASSACHUSETTS
PREPARED FOR
J. BATES & SONS

WSP • SELLS
Transportation & Infrastructure
9 Trolley Crossing Road • Charlton, MA 01507 • 508.248.1970
155 Main Dunstable Rd, Suites 120 & 125 • Nashua, NH 03060 • 603.595.7900
www.wspsells.com

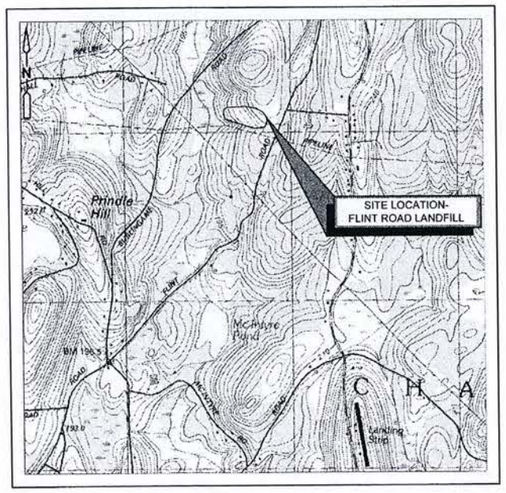
Drawn By RBP		Date	Job No.
Surveyed By JO/JL		OCTOBER 7, 2011	113137
Checked By DJH		Scale	Sheet No.
Book No. CHA-33		1" = 40'	1 OF 1

113137-1-JBATES.dwg

TOWN OF CHARLTON BOARD OF HEALTH
CHARLTON, MASSACHUSETTS

LANDFILL CLOSURE PROJECT

FLINT ROAD LANDFILL
90 FLINT ROAD



LOCATION PLAN

LANDFILL SITE
FLINT ROAD
CHARLTON, MASSACHUSETTS

LIST OF DRAWINGS

SHEET	TITLE
C-1	EXISTING CONDITIONS PLAN
C-2	LANDFILL CLOSURE PLAN
C-3	WETLAND RESTORATION AND REPLICATION PLAN
C-4	WETLAND PLANTING PLAN AND DETAILS
D-1	CIVIL DETAILS I
D-2	CIVIL DETAILS II
D-3	CIVIL DETAILS III

SEPTEMBER 2010

CDM
consulting · engineering · construction · operations

CAMP DRESSER & McKEE INC. **CONSULTING ENGINEERS** **CAMBRIDGE, MASSACHUSETTS**

RECORD MARKUPS

EXISTING CONDITIONS PLAN

GENERAL NOTES:

1. EXISTING CONDITIONS TOPOGRAPHICAL SURVEY INFORMATION IS COMPILATION OF TWO SURVEYS CONDUCTED BY WSP-SELLS. GROUND SURVEY CONDUCTED AUGUST 6, 2009 AND AUGUST 10, 2009; AND AERIAL SURVEY CONDUCTED APRIL, 2003, SUPPLEMENTED BY GROUND SURVEY CONDUCTED IN DECEMBER 2005.
2. HORIZONTAL DATUM SHOWN HEREIN IS NAD83.
3. VERTICAL DATUM SHOWN HEREIN IS NAVD88.
4. WETLANDS EXIST TO THE NORTH-EAST, SOUTH AND WEST OF THE SITE; WETLAND FLAGS NOT SHOWN.
5. CONTRACTOR SHALL CONTACT DIGSAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
6. CONTRACTOR TO PRESERVE AND PROTECT EXISTING PAVEMENT ON THE EAST SIDE OF THE SITE.
7. TOWN OWNED ABOVE GROUND GAS TANK/FUEL STATION LOCATED TO THE EAST OF THE SITE.
8. EXTENT OF RECENTLY CONSTRUCTED ACCESS ROAD, SWALES, RIP RAP SWALES AND CORRESPONDING TOPOGRAPHICAL CONTOURS OUTSIDE THE FML SHALL BE CONSIDERED APPROXIMATE. CONTRACTOR MAY VERIFY TOPOGRAPHY AT HIS/HER OWN EXPENSE IF DEEMED NECESSARY.

N

N/F
NANCY L. JACKSON
BK 15671, PG 330
51-B-3.1

N/F
FRANCO & LINA D'ANNUNZIO
BK 33821, PG 318
51-B-3

N/F
MICHAEL D & ELIZABETH L RESENER
BK 33082, PG 177
51-B-5

N/F
TOWN OF CHARLTON
BK 18612, PG 295
51-B-4.1

N/F
TOWN OF CHARLTON
BK 18612, PG 298
51-B-4

N/F
TOWN OF CHARLTON
51-B-2.1

GP-1
GP-2
GP-3
GP-4
GP-5(not found)

MW-1S (BURIED)
MW-3D (BURIED)
MW-3S
MW-4D
MW-4S

V-1
V-2
V-3
V-4
V-5
V-6

EXISTING RIPRAP DOWNCHUTE
EXISTING PERIMETER ROAD
EXISTING DRAINAGE BASIN
EXISTING RIPRAP DOWNCHUTE
EXISTING PERIMETER SWALE AND ANCHOR TRENCH
EXISTING RIP RAP DOWNCHUTE
EDGE OF EXISTING 40 MIL HDPE FML
EXISTING SOIL PILE ON TOP OF HDPE FML
SOIL STOCKPILE
SOIL STOCKPILE
EDGE OF EXISTING 40 MIL HDPE FML
EXISTING ACCESS ROAD
EXISTING PERIMETER SWALE
EXISTING PAVEMENT
EXISTING ABOVE GROUND GAS TANK/TOWN FUEL STATION.
EXISTING CONDITIONS OUTSIDE OF PERIMETER ACCESS ROAD VARIES IN FIELD FROM PLAN
TRAILER IS NO LONGER ON SITE.
APPROXIMATE GRADES OF CURRENT TOPOGRAPHY

OLD TOWN ROAD
FLINT ROAD

N84°31'05"E 180.05'
N81°03'37"E 81.83'
S60°10'01"E 76.06'
S64°03'33"E 77.19'
N65°38'19"E 208.68'
N70°09'07"E 359.02'
N70°09'54"E 263.73'
N68°18'15"E 161.42'
N83°23'43"E 518.16'
N76°10'58"E 886.37'
N78°49'12"W 641.70'
S82°40'48"W 565.33'
N75°58'12"W

STANDARD OIL CO. OF NEW YORK 33' ET. WOE EASEMENT BK 2540, PG 241
STANDARD OIL CO. OF NEW YORK 33'-4" WIDE EASEMENT - 1st 2540, PG 241 - PLAN BK 849 - PLAN 27

NEW ENGLAND POWER CO. 80' ± WIDE EASEMENT BK 3435, PG 47 PLAN BK 313 - PLAN 107

N/F
NEW ENGLAND POWER CO.
80' ± WIDE EASEMENT
PLAN BK 313 - PLAN 107

PLAN
1" = 50'
25 0 50

LEGEND

EXISTING CONDITIONS

- ABUTTERS LOT LINE
- PROPERTY LINE
- EASEMENT
- STONE WALL
- TREE LINE
- 2003 INTERMEDIATE CONTOURS
- 2003 INDEX CONTOURS
- 2009 INTERMEDIATE CONTOURS
- 2009 INDEX CONTOURS
- TREE LINE
- STONE WALL
- WETLAND
- DEPRESSION CONTOURS
- SPOT ELEVATION
- IRON PIPE FOUND
- CONCRETE BOUND FOUND
- UTILITY POLE
- PERIMETER SWALE AND FLOW DIRECTION
- RIPRAP
- MW-3S GROUNDWATER MONITORING WELL
- GP-3 GAS PROBE
- V-2 GAS VENT

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: L. BUGAY
DRAWN BY: L.BUGAY
SHEET CHK'D BY: C. KODILER
CROSS CHK'D BY: L. BUGAY
APPROVED BY: B. HASKELL
DATE: SEPTEMBER 2010

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting • engineering • construction • operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH

LANDFILL CLOSURE PROJECT

COMMONWEALTH OF MASSACHUSETTS BRUCE WILLIAM HASKELL No. 32907 REGISTERED PROFESSIONAL ENGINEER
9/21/10

EXISTING CONDITIONS PLAN

PROJECT NO. 75398-72037
FILE NAME: CSTPL002
SHEET NO. C-1

RECORD MARKUPS

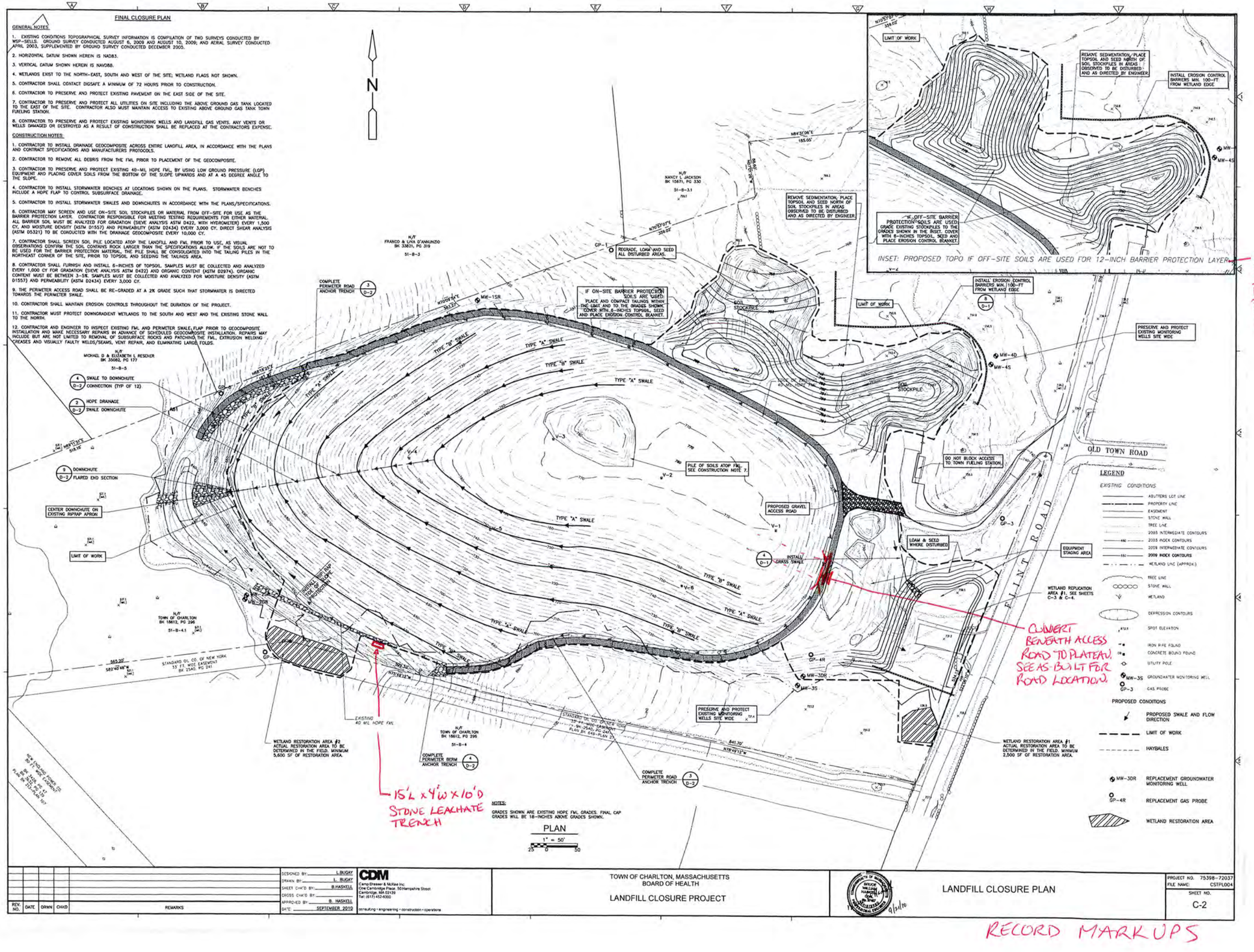
FINAL CLOSURE PLAN

GENERAL NOTES:

1. EXISTING CONDITIONS TOPOGRAPHICAL SURVEY INFORMATION IS COMPILATION OF TWO SURVEYS CONDUCTED BY WSP-SELLS. GROUND SURVEY CONDUCTED AUGUST 6, 2009 AND AUGUST 10, 2009; AND AERIAL SURVEY CONDUCTED APRIL 2003, SUPPLEMENTED BY GROUND SURVEY CONDUCTED DECEMBER 2005.
2. HORIZONTAL DATUM SHOWN HEREIN IS NAD83.
3. VERTICAL DATUM SHOWN HEREIN IS NAVD88.
4. WETLANDS EXIST TO THE NORTH-EAST, SOUTH AND WEST OF THE SITE; WETLAND FLAGS NOT SHOWN.
5. CONTRACTOR SHALL CONTACT DIGSAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
6. CONTRACTOR TO PRESERVE AND PROTECT EXISTING PAVEMENT ON THE EAST SIDE OF THE SITE.
7. CONTRACTOR TO PRESERVE AND PROTECT ALL UTILITIES ON SITE INCLUDING THE ABOVE GROUND GAS TANK LOCATED TO THE EAST OF THE SITE. CONTRACTOR ALSO MUST MAINTAIN ACCESS TO EXISTING ABOVE GROUND GAS TANK TOWN FUELING STATION.
8. CONTRACTOR TO PRESERVE AND PROTECT EXISTING MONITORING WELLS AND LANDFILL GAS VENTS. ANY VENTS OR WELLS DAMAGED OR DESTROYED AS A RESULT OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

CONSTRUCTION NOTES:

1. CONTRACTOR TO INSTALL DRAINAGE GEOCOMPOSITE ACROSS ENTIRE LANDFILL AREA, IN ACCORDANCE WITH THE PLANS AND CONTRACT SPECIFICATIONS AND MANUFACTURERS PROTOCOLS.
2. CONTRACTOR TO REMOVE ALL DEBRIS FROM THE FML PRIOR TO PLACEMENT OF THE GEOCOMPOSITE.
3. CONTRACTOR TO PRESERVE AND PROTECT EXISTING 40-MIL HDPE FML, BY USING LOW GROUND PRESSURE (LGP) EQUIPMENT AND PLACING COVER SOILS FROM THE BOTTOM OF THE SLOPE UPWARDS AND AT A 45 DEGREE ANGLE TO THE SLOPE.
4. CONTRACTOR TO INSTALL STORMWATER BENCHES AT LOCATIONS SHOWN ON THE PLANS. STORMWATER BENCHES INCLUDE A HDPE FLAP TO CONTROL SUBSURFACE DRAINAGE.
5. CONTRACTOR TO INSTALL STORMWATER SWALES AND DOWNCHUTES IN ACCORDANCE WITH THE PLANS/SPECIFICATIONS.
6. CONTRACTOR MAY SCREEN AND USE ON-SITE SOIL STOCKPILES OR MATERIAL FROM OFF-SITE FOR USE AS THE BARRIER PROTECTION LAYER. CONTRACTOR RESPONSIBLE FOR MEETING TESTING REQUIREMENTS FOR EITHER MATERIAL. ALL BARRIER SOIL MUST BE ANALYZED FOR GRADATION (SIEVE ANALYSIS ASTM D422, WITH HYDROMETER) EVERY 1,500 CY, AND MOISTURE DENSITY (ASTM D1557) AND PERMEABILITY (ASTM D2434) EVERY 3,000 CY. DIRECT SHEAR ANALYSIS (ASTM D5321) TO BE CONDUCTED WITH THE DRAINAGE GEOCOMPOSITE EVERY 10,000 CY.
7. CONTRACTOR SHALL SCREEN SOIL PILE LOCATED ATOP THE LANDFILL AND FML PRIOR TO USE, AS VISUAL OBSERVATIONS CONFIRM THE SOIL CONTAINS ROCK LARGER THAN THE SPECIFICATIONS ALLOW. IF THE SOILS ARE NOT TO BE USED FOR THE BARRIER PROTECTION MATERIAL, THE PILE SHALL BE CONSOLIDATED INTO THE TAILING PILES IN THE NORTHEAST CORNER OF THE SITE, PRIOR TO TOPSOIL AND SEEDING THE TAILINGS AREA.
8. CONTRACTOR SHALL FURNISH AND INSTALL 6-INCHES OF TOPSOIL. SAMPLES MUST BE COLLECTED AND ANALYZED EVERY 1,000 CY FOR GRADATION (SIEVE ANALYSIS ASTM D422) AND ORGANIC CONTENT (ASTM D2974). ORGANIC CONTENT MUST BE BETWEEN 3-5%. SAMPLES MUST BE COLLECTED AND ANALYZED FOR MOISTURE DENSITY (ASTM D1557) AND PERMEABILITY (ASTM D2434) EVERY 3,000 CY.
9. THE PERIMETER ACCESS ROAD SHALL BE RE-GRADED AT A 2% GRADE SUCH THAT STORMWATER IS DIRECTED TOWARDS THE PERIMETER SWALE.
10. CONTRACTOR SHALL MAINTAIN EROSION CONTROLS THROUGHOUT THE DURATION OF THE PROJECT.
11. CONTRACTOR MUST PROTECT DOWNGRADIENT WETLANDS TO THE SOUTH AND WEST AND THE EXISTING STONE WALL TO THE NORTH.
12. CONTRACTOR AND ENGINEER TO INSPECT EXISTING FML AND PERIMETER SWALE/FLAP PRIOR TO GEOCOMPOSITE INSTALLATION AND MAKE NECESSARY REPAIRS IN ADVANCE OF SCHEDULED GEOCOMPOSITE INSTALLATION. REPAIRS MAY INCLUDE BUT ARE NOT LIMITED TO REMOVAL OF SUBSURFACE ROCKS AND PATCHING THE FML, EXTRUSION WELDING CREASES AND VISUALLY FAULTY WELDS/SEAMS, VENT REPAIR, AND ELIMINATING LARGE FOLDS.



WETLAND RESTORATION AND REPLICATION PLAN

GENERAL NOTES.

1. EXISTING CONDITIONS TOPOGRAPHICAL SURVEY INFORMATION IS COMPILATION OF TWO SURVEYS CONDUCTED BY WSP-SELLS. GROUND SURVEY CONDUCTED AUGUST 8, 2008 AND AUGUST 10, 2009; AND AERIAL SURVEY CONDUCTED APRIL 2003, SUPPLEMENTED BY GROUND SURVEY CONDUCTED DECEMBER 2005.

2. HORIZONTAL DATUM SHOWN HEREIN IS NAD83.

3. VERTICAL DATUM SHOWN HEREIN IS NAVD88.

4. WETLANDS EXIST TO THE NORTH-EAST, SOUTH AND WEST OF THE SITE; WETLAND FLAGS NOT SHOWN TO THE NORTHEAST OF THE SITE.

5. WETLAND LINE TO THE SOUTH AND WEST OF THE SITE IS APPROXIMATED FROM THE WETLAND LINE DEPICTED ON THE JANUARY 2006 FLINT ROAD LANDFILL FINAL CLOSURE GRADING PLAN PREPARED BY TATA & HOWARD.

6. CONTRACTOR SHALL CONTACT DIGSAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION. UTILITY MARKINGS SHALL INCLUDE THE STANDARD OIL CO. OF NEW YORK EASEMENT LOCATED TO THE SOUTH OF THE SITE IN THE VICINITY OF WETLAND RESTORATION AREA #2.

7. CONTRACTOR TO PRESERVE AND PROTECT EXISTING PAVEMENT ON THE EAST SIDE OF THE SITE.

8. CONTRACTOR TO PRESERVE AND PROTECT ALL UTILITIES ON SITE INCLUDING THE ABOVE GROUND GAS TANK LOCATED TO THE EAST OF THE SITE AND CULVERT TO THE SOUTH-EAST OF SITE. CONTRACTOR ALSO MUST MAINTAIN ACCESS TO EXISTING ABOVE GROUND GAS TANK TOWN FUELING STATION.

9. CONTRACTOR TO PRESERVE AND PROTECT EXISTING MONITORING WELLS AND LANDFILL GAS VENTS. ANY VENTS OR WELLS DAMAGED OR DESTROYED AS A RESULT OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

CONSTRUCTION NOTES.

1. CONTRACTOR TO CONCENTRATE WETLAND SEDIMENT REMOVAL EFFORTS IN AREAS OF DEEPEST DEPOSIT, EXCLUDE AREAS OF FINES AND EXCLUDE AREA OF DENSE TREES. DELINEATED REMOVAL AREAS DEPICTED ARE APPROXIMATE AND WILL VARY IN THE FIELD AS DIRECTED BY THE ENGINEER.

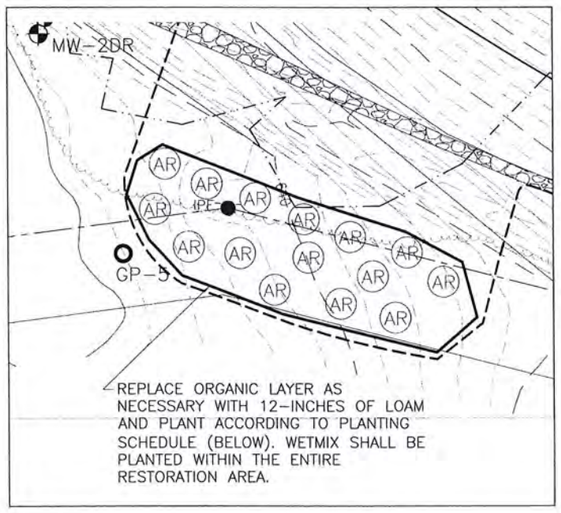
2. SEDIMENT FROM WETLAND RESTORATION AREA #1 SHALL BE HAND DUG USING SHOVELS, RAKES, AND WHEEL BARROWS. CONTRACTOR SHALL MINIMIZE DISRUPTION TO WETLAND DURING REMOVAL AND RESTORATION EFFORTS. FURTHER SEDIMENTATION AND/OR DAMAGE TO THE EXISTING WETLAND PLANTS AS A RESULT OF CONSTRUCTION SHALL BE REMOVED AND RESTORED AT THE CONTRACTORS EXPENSE.

3. SEDIMENT FROM WETLAND RESTORATION AREA #2 MAY BE REMOVED USING HEAVY EQUIPMENT. CONTRACTOR SHALL USE APPROPRIATELY SIZED EQUIPMENT TO REMOVE NECESSARY SEDIMENT WHILE MINIMIZING DISRUPTION TO THE WETLAND OUTSIDE THE RESTORATION AREA DURING REMOVAL AND RESTORATION EFFORTS. FURTHER SEDIMENTATION AND/OR DAMAGE TO THE EXISTING WETLAND PLANTS AS A RESULT OF CONSTRUCTION SHALL BE REMOVED AND RESTORED AT THE CONTRACTORS EXPENSE.

4. CONTRACTOR TO INSTALL WETLAND PLANTS AS SHOWN ON THE PLANTING SCHEDULE AND PLAN (INSET).

5. RESTORATION AREA #1 RECEIVES STORMWATER FROM A CULVERT IN FLINT ROAD. PLANTS IN THIS RESTORATION AREA SHALL BE PLANTED ACCORDING TO THEIR PROXIMITY TO THE FLOW PATH THROUGH THE WETLAND FROM THE CULVERT. SPICEBUSH AND GREEN ASH SHALL BE PLANTED IN THE WETTEST AREAS; NORTHERN ARROWWOOD SHALL BE PLANTED OUTSIDE OF THE FLOW PATH; RED MAPLES AND SWEET PEPPERBUSH SHALL BE PLANTED THE FARTHEST AWAY FROM THE FLOW PATH.

WETLAND RESTORATION AREA #2



PLAN
1" = 20'
10 0 20

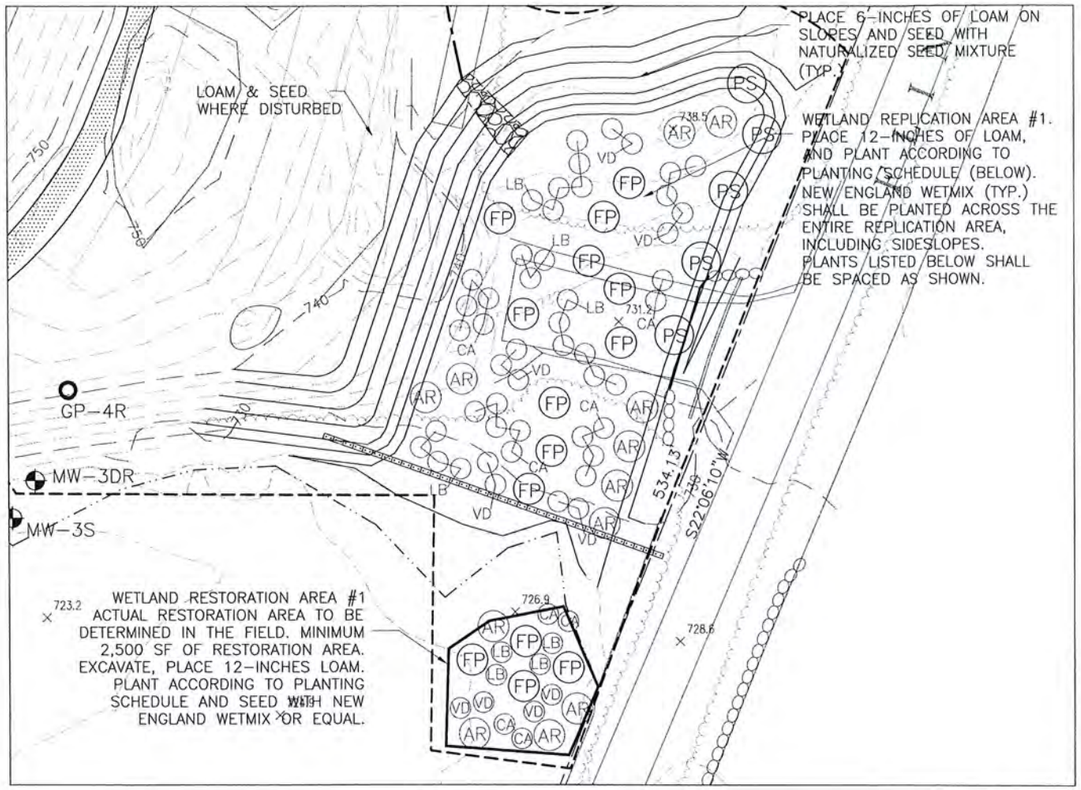
WETLAND RESTORATION AREA #2
PLANTING SCHEDULE

	GENUS/SPECIES	COMMON NAME	QUANTITY	SIZE	SPACING
(AR)	ACER RUBRUM	RED MAPLE	15	SAPLINGS*	12 FEET

* 20% OF THE TREES PLANTED SHALL BE 1 ½" CAL SIZE.

NOTE: IN THE EVENT THAT ACTUAL RESTORTION AREAS DIFFER IN SHAPE IN THE FIELD FROM THE PLAN, PLANTS SHALL BE PLANTED IN CONFORMANCE WITH THE RECOMMENDED GENERAL SPACING LISTED IN THE PLANTING SCHEDULES.

WETLAND REPLICATION AREA #1 AND WETLAND RESTORATION AREA #1



WETLAND REPLICATION AREA #1
PLANTING SCHEDULE

	GENUS/SPECIES	COMMON NAME	QUANTITY	SIZE	SPACING
(PS)	PINUS STOBUS	WHITE PINE	5	SAPLING*	15 FEET
(AR)	ACER RUBRUM	RED MAPLE	8	SAPLING*	12 FEET
(FP)	FRAXINUS PENNSLYVANIA	GREEN ASH	10	SAPLING*	12 FEET
(CA)	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	16	2-3 FT. HT.**	8 FEET
(VD)	VIBURNUM DENTATUM	NORTHERN ARROWWOOD	14	2-3 FT. HT.**	8 FEET
(LB)	LINDERA BENZOIN	SPICEBUSH	19	2-3 FT. HT.**	8 FEET

* 20% OF EACH TYPE OF TREE PLANTED SHALL BE 1 ½" CAL. SIZE.
** 20% OF EACH TYPE OF SHRUB SHALL BE 3-4 FEET IN HEIGHT.

WETLAND RESTORATION AREA #1
PLANTING SCHEDULE

	GENUS/SPECIES	COMMON NAME	QUANTITY	SIZE	SPACING
(AR)	ACER RUBRUM	RED MAPLE	4	SAPLING*	12 FEET (RANDOM)
(FP)	FRAXINUS PENNSLYVANIA	GREEN ASH	4	SAPLING*	12 FEET (RANDOM)
(CA)	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	4	2-3 FT. HT.**	8 FEET (CLUMPED GROUPING)
(VD)	VIBURNUM DENTATUM	NORTHERN ARROWWOOD	4	2-3 FT. HT.**	8 FEET (CLUMPED GROUPING)
(LB)	LINDERA BENZOIN	SPICEBUSH	4	2-3 FT. HT.**	8 FEET (CLUMPED GROUPING)

* 20% OF EACH TYPE OF TREE PLANTED SHALL BE 1 ½" CAL. SIZE.
** 20% OF EACH TYPE OF SHRUB SHALL BE 3-4 FEET IN HEIGHT.

LEGEND

EXISTING CONDITIONS

- ABUTTERS LOT LINE
- PROPERTY LINE
- EASEMENT
- STONE WALL
- TREE LINE
- 2003 INTERMEDIATE CONTOURS
- 680 2003 INDEX CONTOURS
- 2009 INTERMEDIATE CONTOURS
- 680 **2009 INDEX CONTOURS**
- WETLAND LINE (APPROX.)
- TREE LINE
- STONE WALL
- WETLAND
- DEPRESSION CONTOURS
- 722.5 SPOT ELEVATION
- IRON PIPE FOUND
- CONCRETE BOUND FOUND
- UTILITY POLE
- MW-3S GROUNDWATER MONITORING WELL
- GP-3 GAS PROBE

PROPOSED CONDITIONS

- LIMIT OF WORK
- HAYBALES
- MW-3DR REPLACEMENT GROUNDWATER MONITORING WELL
- GP-4R REPLACEMENT GAS PROBE
- WETLAND RESTORATION AREA

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: M. LOFTSTED
DRAWN BY: L. BUGAY
SHEET CHK'D BY: B.HASKELL
CROSS CHK'D BY:
APPROVED BY: B. HASKELL
DATE: SEPTEMBER 2010

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting • engineering • construction • operations

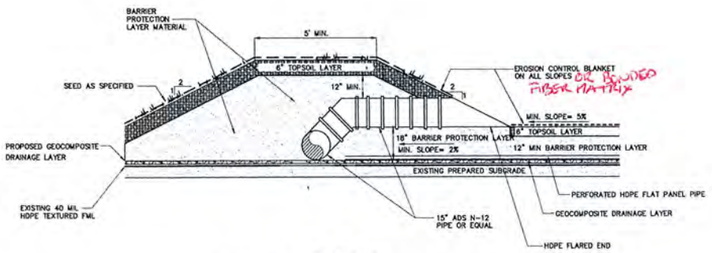
TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH

LANDFILL CLOSURE PROJECT

WETLAND PLANTING PLAN AND DETAILS

PROJECT NO. 75398-72037
FILE NAME: CSTPL004
SHEET NO.
C-4

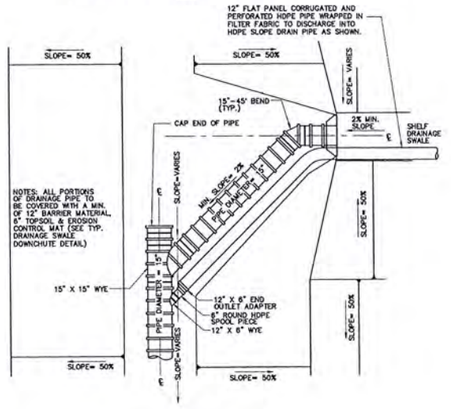
RECORD MARKUPS



SECTION VIEW

HDPE DRAINAGE SWALE INTERSECTION

N.T.S.



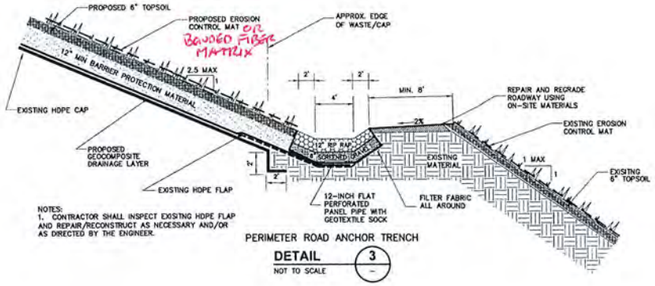
HDPE DRAINAGE PIPE
DRAINAGE SWALE INTERSECTION

DETAIL 1 — NOT TO SCALE

EXTRUSION WELD
(OPTION 2 – SEE SPECIFICATIONS)

TYPICAL HDPE WELD

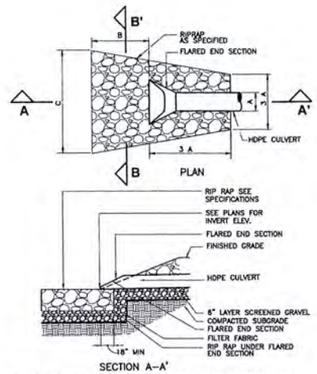
DETAIL 8 — NOT TO SCALE



NOTES:
1. CONTRACTOR SHALL INSPECT EXISTING HDPE FLAP AND REPAIR/RECONSTRUCT AS NECESSARY AND/OR AS DIRECTED BY THE ENGINEER.

PERIMETER ROAD ANCHOR TRENCH

DETAIL 3 — NOT TO SCALE

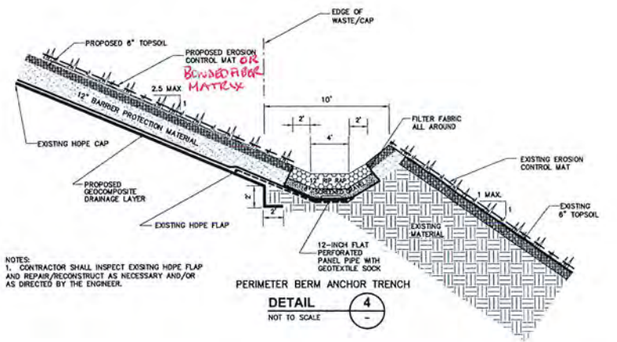


SECTION A–A'

TABLE OF DIMENSIONS — PIPE DOWNCHUTE FLARED END SECTIONS & RIPRAP APRONS

DEVICE	A (INCHES)	B (FEET)	C (FEET)
DOWNCHUTE FLARED END	15 HDPE	10	35

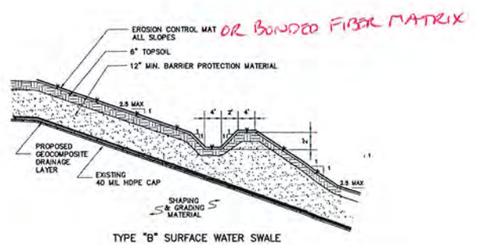
DETAIL 9 — NOT TO SCALE



NOTES:
1. CONTRACTOR SHALL INSPECT EXISTING HDPE FLAP AND REPAIR/RECONSTRUCT AS NECESSARY AND/OR AS DIRECTED BY THE ENGINEER.

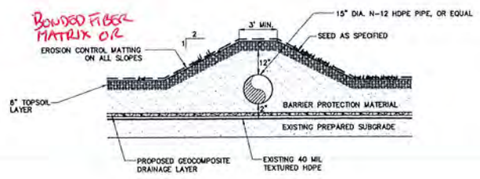
PERIMETER BERM ANCHOR TRENCH

DETAIL 4 — NOT TO SCALE



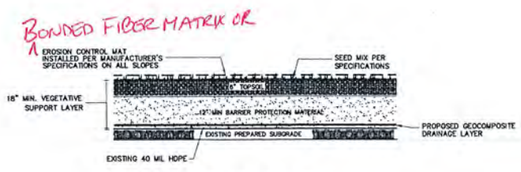
TYPE "B" SURFACE WATER SWALE

DETAIL 5 — NOT TO SCALE



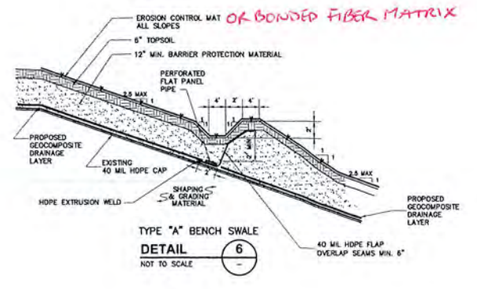
HDPE DRAINAGE SWALE DOWNCHUTE

DETAIL 2 — NOT TO SCALE



TYPICAL FINAL CAP SECTION

DETAIL 7 — NOT TO SCALE



TYPE "A" BENCH SWALE

DETAIL 6 — NOT TO SCALE

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	09/09	MT	CMK	CONFORMED DRAWING

DESIGNED BY: C. KOEHLER
DRAWN BY: M. TOUAYL
SHEET CHK'D BY: C. KOEHLER
CROSS CHK'D BY: L. BUGAY
APPROVED BY: C. KOEHLER
DATE: SEPTEMBER 2010

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting • engineering • construction • operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH

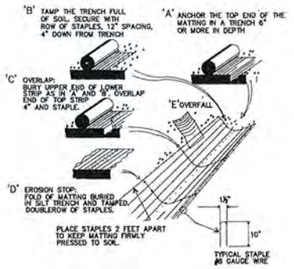
LANDFILL CLOSURE PROJECT

BRUCE WILLIAM HAMILTON — No. 38787 — REGISTERED PROFESSIONAL ENGINEER — 9/9/10

LANDFILL CLOSURE DETAILS

PROJECT NO. 75398-72037
FILE NAME: CSTDT002
SHEET NO. D-2

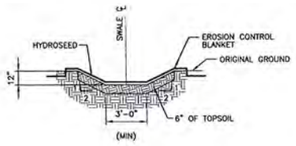
RECORD MARKUPS



EROSION CONTROL MATTING PLACEMENT

DETAIL 1

NOT TO SCALE



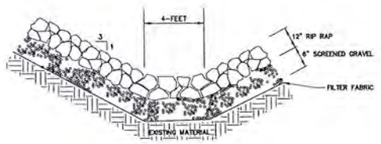
GRASS LINED SWALE

DETAIL 4

NOT TO SCALE

NOTES:

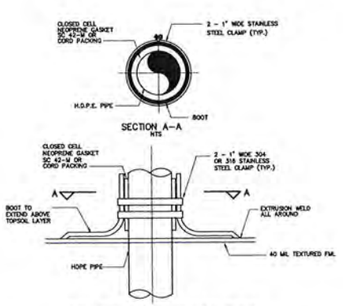
1. INSTALL EROSION CONTROL BLANKET AS SHOWN ON THIS SHEET.



TYPICAL RIP RAP CHANNEL

DETAIL 5

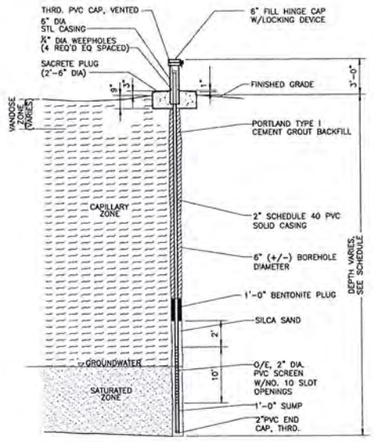
NOT TO SCALE



PIPE PENETRATION SEALING DETAIL

DETAIL 6

NOT TO SCALE



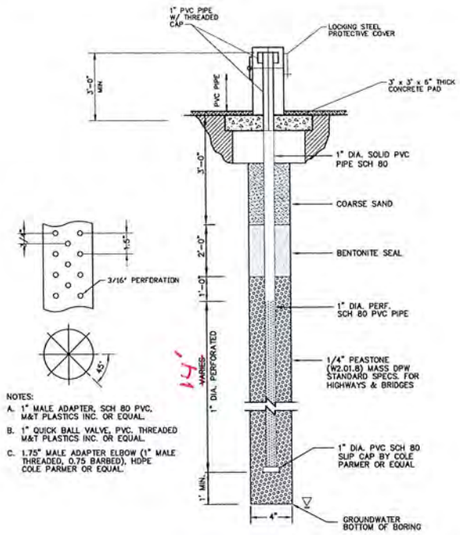
GROUNDWATER MONITORING WELL (TYP.)

DETAIL 2

NTS

GROUNDWATER MONITORING WELL SCHEDULE

WELL	TOTAL DEPTH (BGS)	SCREENED INTERVAL (BGS)
MW-1SR	~~46.5~~ ~~42.50~~	~~33.5~~ ~~29.5~~ - ~~42~~ ~~46~~
MW-2SR	~~12.5~~ ~~TBD~~	~~2-12~~ ~~TBD~~
MW-2DR	~~32.5~~ ~~TBD~~	~~22-32~~ ~~TBD~~
MW-3DR	35.50	27-35



NOTES:

A. 1" MALE ADAPTER, SCH 80 PVC, M&T PLASTICS INC. OR EQUAL.

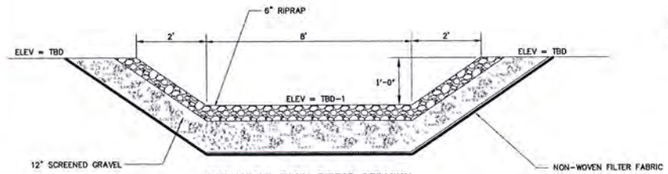
B. 1" QUICK BALL VALVE, PVC, THREADED M&T PLASTICS INC. OR EQUAL.

C. 1.75" MALE ADAPTER ELBOW (1" MALE THREADED, 0.75 BARBED), HOPE COLE PARMER OR EQUAL.

GAS MONITORING WELL (TYP.)

DETAIL 3

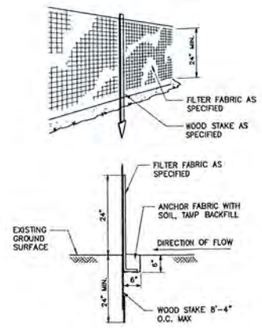
N.T.S.



STORMWATER BASIN RIPRAP SPILLWAY

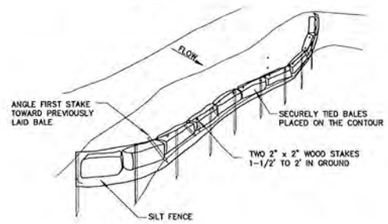
DETAIL 7

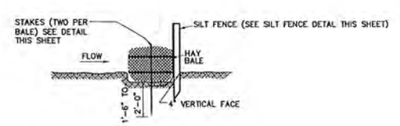
N.T.S.



SILT FENCE DETAIL

N.T.S.

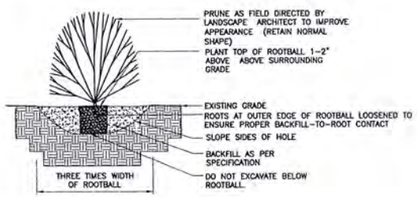




HAYBALE AND SILT FENCE DETAIL

DETAIL 8

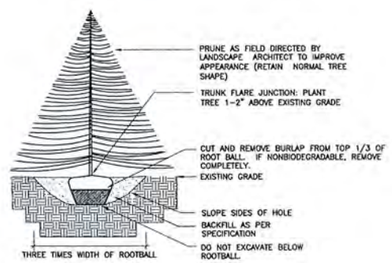
N.T.S.



SHRUB PLANTING

DETAIL 9

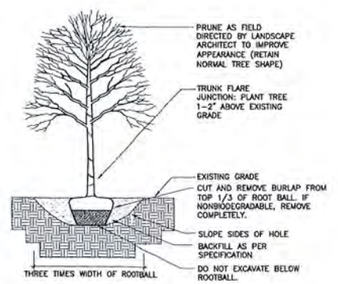
NOT TO SCALE



EVERGREEN TREE PLANTING

DETAIL 10

NOT TO SCALE



DECIDUOUS TREE PLANTING

DETAIL 11

NOT TO SCALE

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: C.KOEHLER/L.BUGAY
DRAWN BY: M. TOUAYL
SHEET CHK'D BY: C. KOEHLER
CROSS CHK'D BY: L. BUGAY
APPROVED BY: B. HASKELL
DATE: SEPTEMBER 2010

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting - engineering - construction - operations

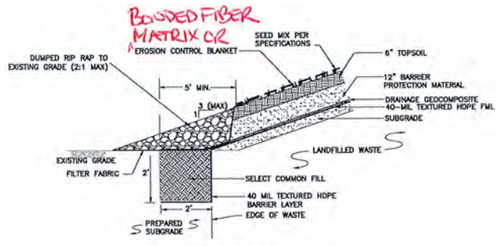
TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH

LANDFILL CLOSURE PROJECT

LANDFILL CLOSURE DETAILS

PROJECT NO. 75398-72037
FILE NAME: CSTDT001
SHEET NO. D-1

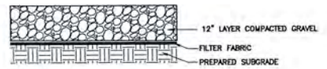
RECORD MARKUPS



TOE OF SLOPE RIP RAP

DETAIL 1

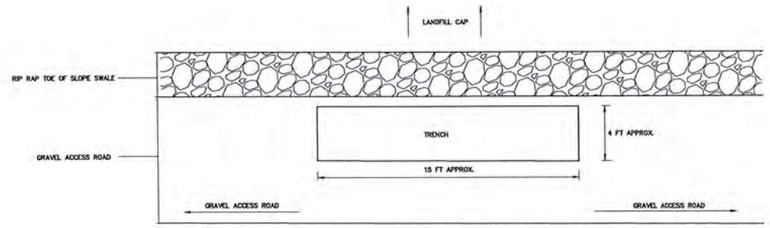
NOT TO SCALE



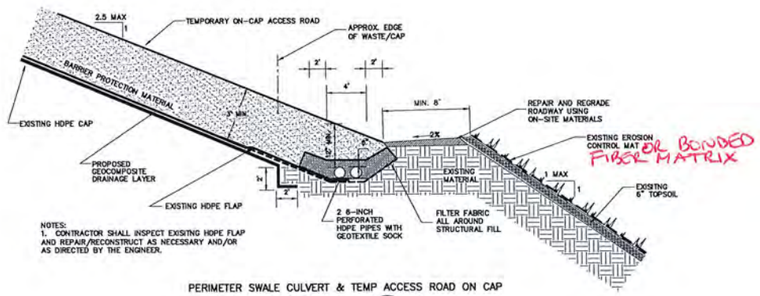
GRAVEL ACCESS ROAD

DETAIL 2

NOT TO SCALE



PLAN VIEW

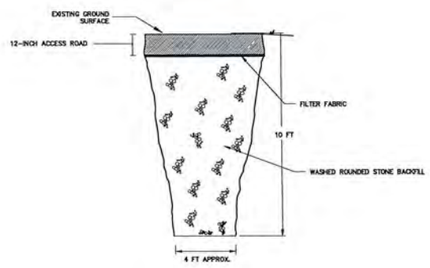


NOTES:
1. CONTRACTOR SHALL INSPECT EXISTING HDPE FLAP AND REPAIR/RECONSTRUCT AS NECESSARY AND/OR AS DIRECTED BY THE ENGINEER.

PERIMETER SWALE CULVERT & TEMP ACCESS ROAD ON CAP

DETAIL 3

NOT TO SCALE



LEACHATE TRENCH

DETAIL 4

NOT TO SCALE

NOTE: TEMPORARY ACCESS ROAD BUILT FOR CONSTRUCTION BECAME PERMANENT ACCESS ROAD TO PLATEAU. SEE AS-BUILT FOR LOCATION.

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	06/12	LB	BH	RECORD MARK-UPS

DESIGNED BY: C. KOEHLER
DRAWN BY: M. TONATI
SHEET CHK'D BY: C. KOEHLER
CROSS CHK'D BY: L. BUGAY
APPROVED BY: C. KOEHLER
DATE: SEPTEMBER 2010

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting • engineering • construction • operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH

LANDFILL CLOSURE PROJECT

LANDFILL CLOSURE DETAILS

PROJECT NO. 0644-89096
FILE NAME: CSTD1T003
SHEET NO. D-3

NEW DETAIL SHEET FOR RECORD MARKUPS

RECORD MARKUPS

Appendix C
Gas Venting/Subgrade Layer Documentation
(By Others)

Haskell, Bruce

From: Alan Duncan [aduncan@batgenvironmental.com]
Sent: Tuesday, April 07, 2009 11:09 AM
To: Haskell, Bruce
Cc: Michael Donato; Lani Criasia (E-mail)
Subject: Charlton Landfill Payment Request
Attachments: Payment Spreadsheet.pdf; Permeability Results.pdf

Bruce:

Attached is a copy of our payment request to the Town, as well as, permeability results for the gas venting layer. If you have any questions give me a call.

Alan

<<Payment Spreadsheet.pdf>> <<Permeability Results.pdf>>

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	UTS of Massachusetts		
Project Name:	W.L. French Excavating		
Project Location:	Charlton MA		
GTX #:	8626		
Start Date:	11/04/08	Tested By:	ema
End Date:	11/05/08	Checked By:	jdt
Boring #:	---		
Sample #:	Sample 103		
Depth:	---		
Visual Description:	Dry, pale yellow silty sand		

Permeability of Granular Soils (Constant Head) by ASTM D 2434

Sample Type: Remolded

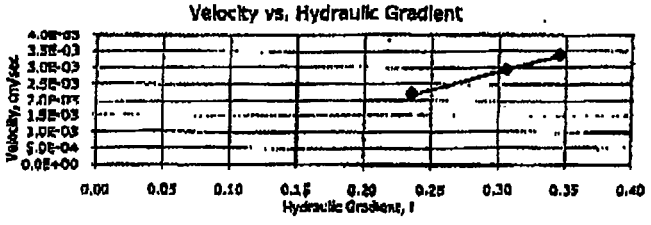
Sample Information:

Maximum Dry Density:	--- pcf
Optimum Moisture Content:	--- %
Compaction Test Method:	---
Classification (ASTM D 2487):	---
Assumed Specific Gravity:	2.65

Sample Preparation / Test Setup: Target Compaction: 95% of 117.2 pcf (value provided by client) at air-dried moisture content; >3/8 inch material screened out of sample prior to testing. 5.27 lb surcharge

Parameter	Initial	Final
Height, in	4.03	4.03
Diameter, in	3.98	3.90
Area, in^2	12.4	12.4
Volume, in^3	50.1	50.1
Mass, g	1465	1730
Bulk Density, pcf	111	131
Moisture Content, %	0.3	18.2
Dry Density, pcf	111	111
Degree of Saturation, %	---	98.9
Void Ratio, e	---	0.49

Date	Reading #	Volume of Flow, cc	Time of Flow, sec	Flow Rate, cc/sec	Gradient	Permeability, cm/sec	Temp., °C	Correction Factor	Permeability @ 20 °C, cm/sec
11/04	1	1.74	10	0.17	0.24	9.2E-03	15.0	1.135	1.0E-02
11/04	2	1.80	10	0.18	0.24	9.5E-03	15.0	1.135	1.1E-02
11/04	3	1.73	10	0.17	0.24	9.2E-03	15.0	1.135	1.0E-02
11/04	4	2.34	10	0.23	0.31	9.6E-03	15.0	1.135	1.1E-02
11/04	5	2.35	10	0.24	0.31	9.6E-03	15.0	1.135	1.1E-02
11/04	6	2.35	10	0.24	0.31	9.6E-03	15.0	1.135	1.1E-02
11/04	7	2.68	10	0.27	0.35	9.7E-03	15.0	1.135	1.1E-02
11/04	8	2.74	10	0.27	0.35	9.9E-03	15.0	1.135	1.1E-02
11/04	9	2.73	10	0.27	0.35	9.9E-03	15.0	1.135	1.1E-02



PERMEABILITY @ 20 °C =

1.1×10^{-2} cm/sec

GeoTesting express
a subsidiary of Geocomp Corporation

Client:	BATG Environmental		
Project Name:	Charlton Landfill		
Project Location:	Charlton, MA		
GTX #:	8623		
Start Date:	11/06/08	Tested By:	ema
End Date:	11/06/08	Checked By:	rmt
Boring #:	---		
Sample #:	Sand		
Depth:	---		
Visual Description:	Dry, yellowish brown silty sand		

Permeability of Granular Soils (Constant Head) by ASTM D 2434

Sample Type: Remolded

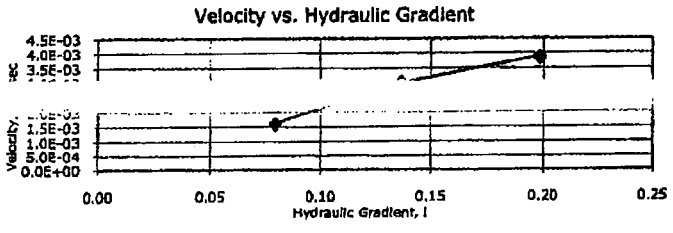
Sample Information:

Maximum Dry Density:	--- pcf
Optimum Moisture Content:	--- %
Compaction Test Method:	ASTM D 1557
Classification (ASTM D 2487):	---
Assumed Specific Gravity:	2.65

Sample Preparation / Test Setup: Compacted with moderate to dense effort at air-dried moisture content; >3/8 inch material screened out of sample prior to testing (7.0% of sample). 5.27 lb surcharge

Parameter	Initial	Final
Height, in	4.03	4.03
Diameter, in	3.98	3.98
Area, in^2	12.4	12.4
Volume, in^3	50.1	50.1
Mass, g	1629	1822
Bulk Density, pcf	124	138
Moisture Content, %	0.7	12.7
Dry Density, pcf	123	123
Degree of Saturation, %	---	96.9
Void Ratio, e	---	0.35

Date	Reading #	Volume of Flow, cc	Time of Flow, sec	Flow Rate, cc/sec	Gradient	Permeability, cm/sec	Temp., °C	Correction Factor	Permeability @ 20 °C, cm/sec
11/6	1	1.91	15	0.13	0.08	2.0E-02	15.0	1.135	2.3E-02
11/6	2	1.96	15	0.13	0.08	2.1E-02	15.0	1.135	2.3E-02
11/6	3	1.96	15	0.13	0.08	2.1E-02	15.0	1.135	2.3E-02
11/6	4	3.63	15	0.24	0.14	2.2E-02	15.0	1.135	2.5E-02
11/6	5	3.64	15	0.24	0.14	2.2E-02	15.0	1.135	2.5E-02
11/6	6	3.61	15	0.24	0.14	2.2E-02	15.0	1.135	2.5E-02
11/6	7	4.69	15	0.31	0.20	2.0E-02	15.0	1.135	2.2E-02
11/6	8	4.69	15	0.31	0.20	2.0E-02	15.0	1.135	2.2E-02
11/6	9	4.60	15	0.31	0.20	1.9E-02	15.0	1.135	2.2E-02



PERMEABILITY @ 20 °C =

2.3×10^{-2} cm/sec

Appendix D

Replacement Geomembrane Information

Appendix D-1
Liner Certification

May 25, 2011

Mail To:

David Welch
New England Liner System, Inc.
40 Westfield Drive
Plantsville, CT 06479

email: dawelch@aol.com

Bill To:

<= Same

Dear Mr. Welch:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Charlton Landfill**
TRI Job Reference Number:	E2356-20-04
Material(s) Tested:	1 Agru 40 mil Microspike HDPE Geomembrane
Test(s) Requested:	Thickness (ASTM D 5994) Density (ASTM D 1505) Carbon Content (ASTM D 4218) Carbon Dispersion (ASTM D 5596) Tensile (ASTM D 6693) Tear Resistance (ASTM D 1004)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

MPatel

Dr. Mansukh Patel
Sr. Laboratory Coordinator
Geosynthetic Services Division
www.GeosyntheticTesting.com

cc: Sam R. Allen, Vice President and Division Manager

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOMEMBRANE TEST RESULTS

TRI Client: New England Liner System, Inc.
Project: Charlton Landfill

Material: Agru 40 mil Microspike HDPE Geomembrane
Sample Identification: 215107-11
TRI Log #: E2356-20-04

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.
Thickness (ASTM D 5994)												
Thickness (mils)	48	48	46	44	45	43	42	42	47	48	45 42	2 << min
Density (ASTM D 1505)												
Density (g/cm3)	0.946	0.946	0.946								0.946	0.000
Carbon Black Content (ASTM D 4218)												
% Carbon Black	2.44	2.44									2.44	0.00
Carbon Black Dispersion (ASTM D 5596)												
Rating - 1st field view	1	1	1	1	1							
Rating - 2nd field view	1	1	1	1	1							
Tensile Properties (ASTM D 6693, 2 ipm strain rate)												
MD Yield Strength (ppi)	93	106	110	123	124						111	13
TD Yield Strength (ppi)	116	125	115	113	118						117	5
MD Break Strength (ppi)	97	180	127	171	180						151	37
TD Break Strength (ppi)	117	130	84	82	109						104	21
MD Yield Elongation (%)	17	17	19	18	18						18	1
TD Yield Elongation (%)	15	15	15	15	15						15	0
MD Break Elongation (%)	364	416	374	441	410						401	32
TD Break Elongation (%)	490	525	271	146	499						386	168
Tear Resistance (ASTM D 1004)												
MD Tear Strength (lbs)	43	41	38	40	48	45	39	38	40	47	42	4
TD Tear Strength (lbs)	39	34	32	30	38	38	35	37	32	36	35	3

MD Machine Direction TD Transverse Direction NA Not Available

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

agru america
quality control dept

quality certificate

ROLL # **215107-11** Lot #: **8210239** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**0.96**	mm	**38**	mil
	MAX:	**1.13**	mm	**44**	mil
Asperity ASTM D7466: **27/36** mil	AVE:	**1.03**	mm	**41**	mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.0 mm**	**40 mil**
Length.....	**216.411** m	**710.0** feet
Width.....	**7.00** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **186**

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		**.943**	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g		g/10 min		**.24**	
Carbon Black Content ASTM D4218	Range		%		**2.14**	
Carbon Black Dispersion ASTM D5596	Category				**10 In Cat 1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**19**	N/mm	**107** ppi	**2,648**	psi
	Average Strength @ Break	**22**	N/mm	**127** ppi	**3,127**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		**17.02**	
Lo = 2.0" Break	Average Elongation @ Break		%		**432.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		**-0.29**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**179.0**	N		**40.248**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**290.0**	N		**65.207**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**462.8**	N		**104.04**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		**PASS**	

Customer:
PO:
Destination

Date: **4-11-11**

Signature: *M Holmes*

Quality Control Department

40HDmic.FRM
REV 02
12/23/05

agru america quality control dept

quality certificate

ROLL # **215104-11** Lot #: **8210239** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.00 mm	39 mil
	MAX:	1.14 mm	45 mil
Asperity ASTM D7466: 27/38 mil	AVE:	1.05 mm	41 mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	1.0 mm	40 mil
Length.....	216.411 m	710.0 feet
Width.....	7.00 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **186**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.943	
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			.24	
Carbon Black Content ASTM D4218	Range	%			2.14	
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	19 N/mm	111 ppi		2,678	psi
	Average Strength @ Break	21 N/mm	121 ppi		2,920	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			16.36	
Lo = 2.0" Break	Average Elongation @ Break	%			396.7	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.29	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	179.0 N			40.248	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	290.0 N			65.207	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	462.8 N			104.04	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS	

Customer:
PO:
Destination

Date: 4-11-11

Signature: [signature]
Quality Control Department

40HDmic.FRM
REV 02
12/23/05

agru america
quality control dept

quality certificate

ROLL # **412222-11** Lot #: **8110225** **Liner Type: MICROSPIKE™ HDPE**

		METRIC		ENGLISH				
Measurement ASTM D5994 (Modified)	MIN:	0.96	mm	38	mil	Thickness.....	1.0 mm	40 mil
	MAX:	1.13	mm	44	mil	Length.....	216.411 m	710.0 feet
Asperity ASTM D7466: 27/30 mil	AVE:	1.05	mm	41	mil	Width.....	7.00 m;	23.0 feet

ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes **194**

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			.949
MFI ASTM D1238 COND. E GRADE: **K307**	Melt Flow Index 190°C /2160 g	g/10 min			.25
Carbon Black Content ASTM D4218	Range	%			2.58
Carbon Black Dispersion ASTM D5596	Category				10 In Cat 1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	17 N/mm	96 ppi		2,329 psi
	Average Strength @ Break	22 N/mm	125 ppi		3,030 psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			19.40
	Average Elongation @ Break	%			487.2
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.27
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	175.1 N			39.376 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	306.5 N			68.916 lbs
Puncture Resistance ASTM D4833 (Modified)	Load	416.7 N			93.690 lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			PASS

Customer:
PO:
Destination

Date: 3-22-11

Signature: [signature]
Quality Control Department

40HDmic.FRM
REV 02
12/23/05

Chevron Phillips Chemical Company LP

CoA Date: 02/24/2011

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

CPC Delivery #: 88218455
PO #: 005834
Weight: 185600 LB
Ship Date: 02/24/2011
Package: BULK
Mode: Hopper Car
Car #: CEFX053842
Seal No: 263303

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 8110225

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.25	g/10mi
HLMI Flow Rate	ASTM D1238	20	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Pellet Count	P02.08.03	25	pel/g
Production Date		02/21/2011	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at 800-231-1212

Chevron Phillips Chemical Company LP

CoA Date: 03/02/2011

Certificate of Analysis

Shipped To: AGRU AMERICA INC
500 GARRISON RD
GEORGETOWN SC 29440
USA

Recipient: PALMER
Fax:

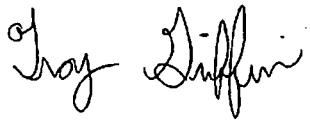
CPC Delivery #: 88221833
PO #: 005840
Weight: 183400 LB
Ship Date: 03/02/2011
Package: BULK
Mode: Hopper Car
Car #: NAHX610124
Seal No: 263709

Product:
MARLEX POLYETHYLENE K307 BULK

Lot Number: 8210239

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.24	g/10mi
HLMI Flow Rate	ASTM D1238	19	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Pellet Count	P02.08.03	24	pel/g
Production Date		02/27/2011	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. **However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**



Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at 800-231-1212

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679	Tested By:	bfs
Test Date:	04/11/11	Checked By:	jdt
Sample ID:	Roll #108154944		
Description:	Black, 40 mil textured geomembrane, GSE		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D 1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mils	Tear Resistance, lbs	Thickness, mils	Tear Resistance, lbs
1	41.9	35	44.8	39
2	43.6	36	46.3	38
3	43.2	41	43.0	37
4	47.1	38	48.6	39
5	43.6	39	50.7	41
6	47.2	41	44.0	42
7	41.2	37	48.5	43
8	40.1	36	46.8	38
9	41.0	35	43.5	38
10	41.8	35	49.6	41
Average	43.0	37	46.6	40
Standard Deviation	2.44	2.2	2.71	2.0

Comments: 28 lbs 28 lbs

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	New England Liner Systems
Project:	Flint Road Landfill
Project Location:	Charlton, MA
GTX Project No.:	10679
Test Date:	04/12/11
Tested By:	bfs
Checked By:	jdt

Density of Plastics by the Density-Gradient Technique by ASTM D 1505

Sample ID	Spec. #	Density, g/cm^3
Roll #108154944 Black, 40 mil textured geomembrane, GSE	1	0.9200
	2	0.9200
	3	0.9200
	AVG.	0.9200

Comments: Temperature: 23°C

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679	Tested By:	bfs/mgd
Test Date:	04/13/11	Checked By:	jdt

Carbon Black in Olefin Plastics by ASTM D 1603

Sample ID	Specimen Number	Carbon Black, %
Roll #108154944 Black, 40 mil textured geomembrane, GSE	1	2.51
	2	2.49
	Average	2.50

2%-3%

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Appendix D-2
Interface Friction Angle Test Results

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679		
Start Date:	04/25/11	Tested By:	bfs
End Date:	04/25/11	Checked By:	jdt
Geosynthetic ID:	Geocomposite: GSE Roll #131364893 Geomembrane: Agru Microspike		
Geosynthetic Description:	Black, biplanar geocomposite Black, microspike geomembrane		

Interface Shear Test Series by ASTM D 5321

Test Series #:	1		
Test Profile - Top to Bottom:	textured steel plate / GEOCOMPOSITE / GEOMEMBRANE / textured steel plate		
Soil Preparation:	---		
Compaction Characteristics:	Maximum Dry Density	--- pcf	
	Optimum Moisture Content	--- %	
	Compaction Test Method	---	
Geosynthetic Preparation:	Saturated at the normal load for 15 minutes prior to shear		
Test Equipment:	Top box = 12 in x 12 in; Bottom box = 16 in x 12 in; Load cells and LVDTs connected to data acquisition system for shear force, normal load and horizontal displacement readings; Flat plate clamping device; surface area = 144 in^2		
Horizontal Displacement, in/min:	0.04	Test Condition:	inundated

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Initial Moisture Content, %	---	---	---	---	---	---
Initial Dry Density, pcf	---	---	---	---	---	---
Percent Compaction, %	---	---	---	---	---	---
Normal Compressive Stress, psi	2.0	21	50	---	---	---
Peak Shear Stress, psi	2.0	11	21	---	---	---
Post Peak Shear Stress, psi	1.1	6.1	13	---	---	---
Final Moisture Content, %	---	---	---	---	---	---
Peak Secant Friction Angle, °	45.1	26.9	22.6	---	---	---
Post-Peak Secant Friction Angle, °	28.3	16.2	14.9	---	---	---

NOTES:

Peak Friction Angle:	**21.3**	**degrees**
Peak Adhesion:	**1.7**	**psi**
Post Peak Friction Angle:	**14.3**	**degrees**
Post Peak Adhesion:	**0.6**	**psi**

Figure a. Shear Force vs. Horizontal Displacement

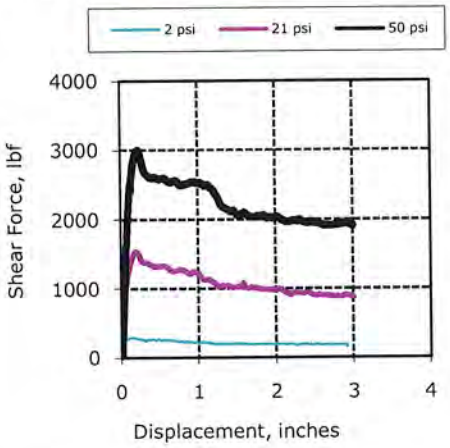
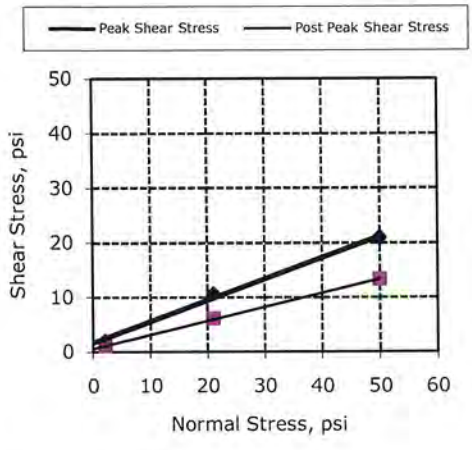


Figure b. Shear Stress vs. Normal Stress



Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679		
Start Date:	04/25/11	Tested By:	bfs
End Date:	04/26/11	Checked By:	jdt
Geosynthetic ID:	Geocomposite: GSE Roll #131364893 Geomembrane: Agru Microspike		
Geosynthetic Description:	Black, biplanar geocomposite Black, microspike geomembrane		

Interface Shear Test Series by ASTM D 5321

Test Series #:	1a
Test Profile - Top to Bottom:	textured steel plate / GEOCOMPOSITE / GEOMEMBRANE / textured steel plate
Soil Preparation:	---
Compaction Characteristics:	Maximum Dry Density --- pcf Optimum Moisture Content --- % Compaction Test Method ---
Geosynthetic Preparation:	Saturated at the normal load for 15 minutes prior to shear
Test Equipment:	Top box = 12 in x 12 in; Bottom box = 16 in x 12 in; Load cells and LVDTs connected to data acquisition system for shear force, normal load and horizontal displacement readings; Flat plate clamping device; surface area = 144 in^2
Horizontal Displacement, in/min:	0.04 Test Condition: inundated

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Initial Moisture Content, %	---	---	---	---	---	---
Initial Dry Density, pcf	---	---	---	---	---	---
Percent Compaction, %	---	---	---	---	---	---
Normal Compressive Stress, psi	2.0	21	50	---	---	---
Peak Shear Stress, psi	2.0	11	22	---	---	---
Post Peak Shear Stress, psi	1.1	6.1	13	---	---	---
Final Moisture Content, %	---	---	---	---	---	---
Peak Secant Friction Angle, °	45.1	26.9	23.6	---	---	---
Post-Peak Secant Friction Angle, °	28.3	16.2	14.8	---	---	---

NOTES:

Peak Friction Angle:	**22.3**	**degrees**
Peak Adhesion:	**1.5**	**psi**
Post Peak Friction Angle:	**14.1**	**degrees**
Post Peak Adhesion:	**0.7**	**psi**

Figure a. Shear Force vs. Horizontal Displacement

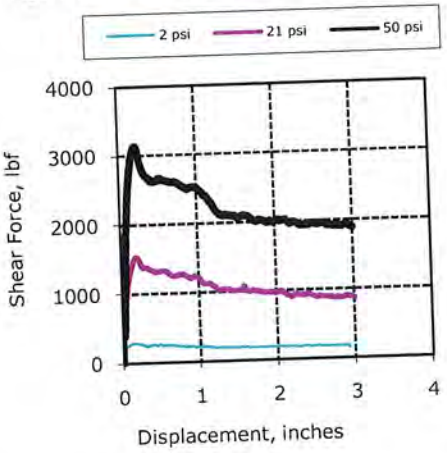
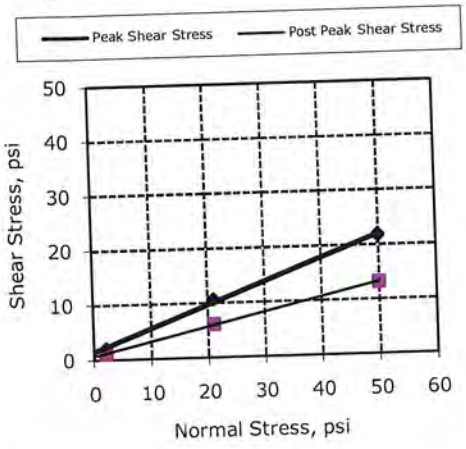


Figure b. Shear Stress vs. Normal Stress



Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679		
Start Date:	04/25/11	Tested By:	bfs
End Date:	04/26/11	Checked By:	jdt
Geosynthetic ID:	Geocomposite: GSE Roll #131364860 Geomembrane: GSE		
Geosynthetic Description:	Black, biplanar geocomposite Black, 40 mil textured geomembrane		

Interface Shear Test Series by ASTM D 5321

Test Series #:	2	
Test Profile - Top to Bottom:	textured steel plate / GEOCOMPOSITE / GEOMEMBRANE / textured steel plate	
Soil Preparation:	---	
Compaction Characteristics:	Maximum Dry Density	--- pcf
	Optimum Moisture Content	--- %
	Compaction Test Method	---
Geosynthetic Preparation:	Saturated at the normal load for 15 minutes prior to shear	
Test Equipment:	Top box = 12 in x 12 in; Bottom box = 16 in x 12 in; Load cells and LVDTs connected to data acquisition system for shear force, normal load and horizontal displacement readings; Flat plate clamping device; surface area = 144 in^2	
Horizontal Displacement, in/min:	0.04	Test Condition: inundated

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Initial Moisture Content, %	---	---	---	---	---	---
Initial Dry Density, pcf	---	---	---	---	---	---
Percent Compaction, %	---	---	---	---	---	---
Normal Compressive Stress, psi	2.0	21	50	---	---	---
Peak Shear Stress, psi	1.3	8.2	18	---	---	---
Post Peak Shear Stress, psi	0.9	5.0	11	---	---	---
Final Moisture Content, %	---	---	---	---	---	---
Peak Secant Friction Angle, °	32.0	21.4	20.1	---	---	---
Post-Peak Secant Friction Angle, °	24.3	13.4	11.9	---	---	---

NOTES:

Peak Friction Angle:	**19.5**	**degrees**
Peak Adhesion:	**0.6**	**psi**
Post Peak Friction Angle:	**11.3**	**degrees**
Post Peak Adhesion:	**0.6**	**psi**

Figure a. Shear Force vs. Horizontal Displacement

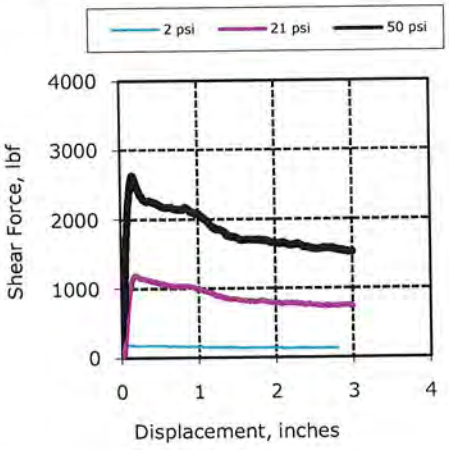
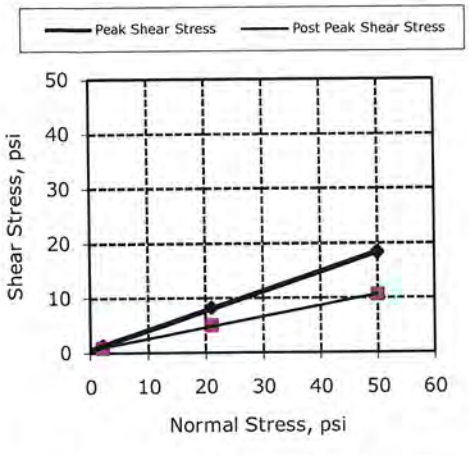


Figure b. Shear Stress vs. Normal Stress



Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

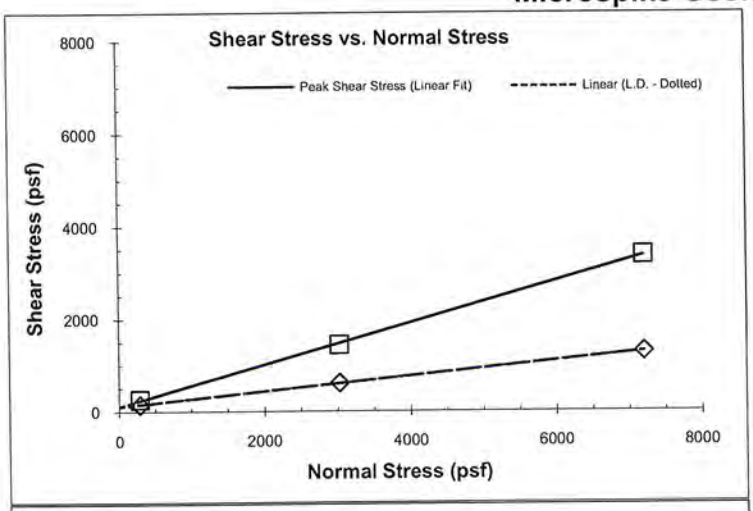
Interface Friction Test Report

Client: **New England Liner Systems**
Project: **Flint Road Landfill**
Test Date: 04/28/11-04/28/11

TRI Log#: E2347-82-06
Test Method: ASTM D 5321

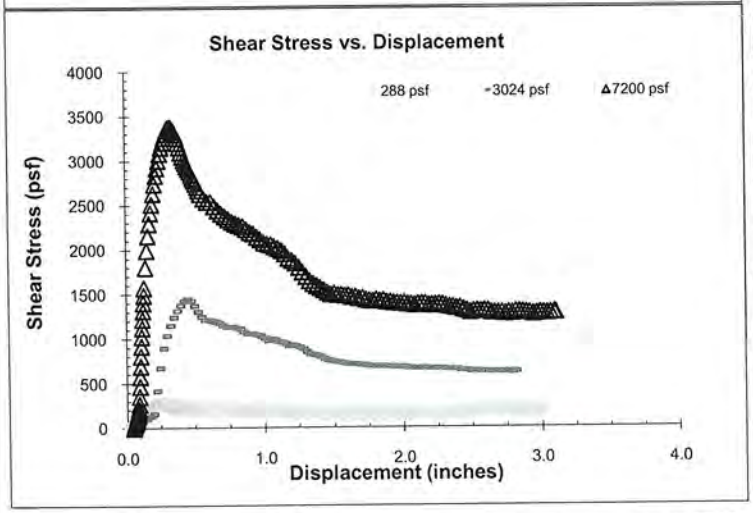
John M. Allen, P.E., 04/28/2011
Quality Review/Date

Tested Interface: GSE Double-sided Geocomposite (131364878) vs. Agru 40 mil HDPE Microspike Geomembrane



Test Results		
	Peak	**Large Displacement (@ 3.0 in.)**
Friction Angle (degrees):	**24.3**	**9.3**
Y-intercept or Adhesion (psf):	**112**	**109**

Shearing occurred at the interface.



Test Conditions

Upper Box & Lower Box: GSE double-sided geocomposite

Lower Box: Agru 40 mil HDPE Microspike geomembrane (dull side)

Box Dimensions: 12"x12"x4"

Interface Conditioning: Interface soaked and loading applied for a minimum of 1 hour prior to shear.

Test Condition: Wet

Shearing Rate: 0.2 inches/minute

Test Data

Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	11	37	76
Normal Stress (psf)	288	3024	7200
Corrected Peak Shear Stress (psf)	263	1443	3375
Corrected Large Displacement Shear Stress (psf)	151	613	1287
Peak Secant Angle (degrees)	42.4	25.5	25.1
Large Displacement Secant Angle (degrees)	27.7	11.5	10.1
Asperity (mils)	25.2	25.2	25.8

9063 Bee Caves Road □ Austin, TX 78733-6201 □ (512) 263-2101 □ (512) 263-2558 □ 1-800-880-TEST

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

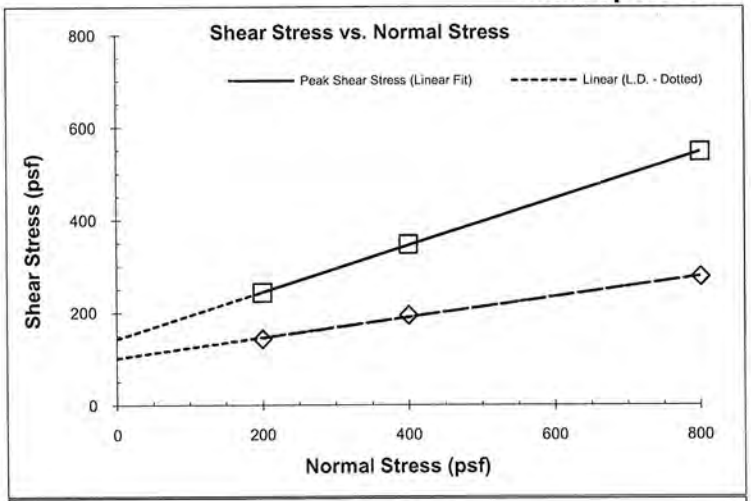
Interface Friction Test Report

Client: **New England Liner Systems**
Project: **Flint Road Landfill**
Test Date: 04/29/11-04/29/11

TRI Log#: E2347-82-06
Test Method: ASTM D 5321

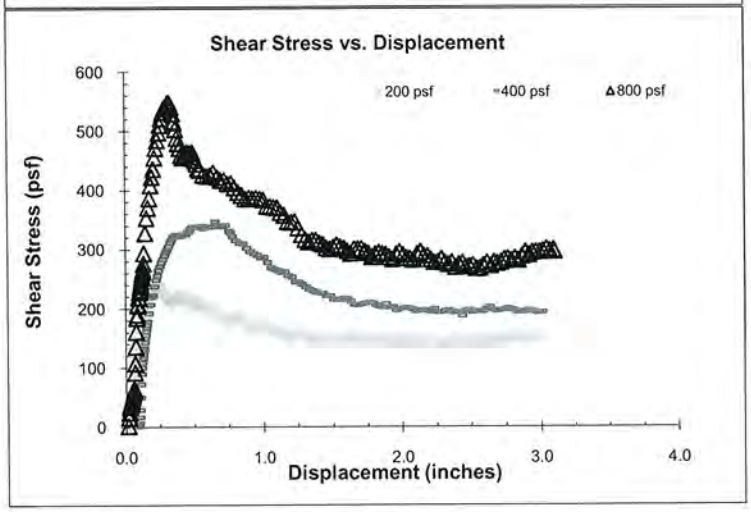
John M. Allen, P.E., 04/29/2011
Quality Review/Date

Tested Interface: GSE Double-sided Geocomposite (131364878) vs. Agru 40 mil HDPE Microspike Geomembrane



Test Results		
	Peak	**Large Displacement (@ 3.0 in.)**
Friction Angle (degrees):	**26.8**	**12.5**
Y-intercept or Adhesion (psf):	**143**	**102**

Shearing occurred at the interface.



Test Conditions

Upper Box &	GSE double-sided geocomposite
Lower Box	Agru 40 mil HDPE Microspike geomembrane (dull side)
Box Dimensions: 12"x12"x4"	
Interface Conditioning:	Interface soaked and loading applied for a minimum of 1 hour prior to shear.
Test Condition: Wet	
Shearing Rate: 0.2 inches/minute	

Test Data

Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	10	12	16
Normal Stress (psf)	200	400	800
Corrected Peak Shear Stress (psf)	243	347	547
Corrected Large Displacement Shear Stress (psf)	143	194	277
Peak Secant Angle (degrees)	50.6	40.9	34.4
Large Displacement Secant Angle (degrees)	35.6	25.9	19.1
Asperity (mils)	23.8	23.8	23.6

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679		
Start Date:	05/03/11	Tested By:	bfs
End Date:	05/04/11	Checked By:	jdt
Geosynthetic ID:	Geocomposite: GSE Roll #131364926 Geomembrane: Solmax On-site Sample		
Geosynthetic Description:	Black, biplanar geocomposite Black, textured geomembrane		

Interface Shear Test Series by ASTM D 5321

Test Series #:	3
Test Profile - Top to Bottom:	textured steel plate / GEOCOMPOSITE / GEOMEMBRANE / textured steel plate
Soil Preparation:	---
Compaction Characteristics:	Maximum Dry Density --- pcf Optimum Moisture Content --- % Compaction Test Method ---
Geosynthetic Preparation:	Saturated at the normal load for 15 minutes prior to shear
Test Equipment:	Top box = 12 in x 12 in; Bottom box = 16 in x 12 in; Load cells and LVDTs connected to data acquisition system for shear force, normal load and horizontal displacement readings; Flat plate clamping device; surface area = 144 in^2
Horizontal Displacement, in/min:	0.2 Test Condition: inundated

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Initial Moisture Content, %	---	---	---	---	---	---
Initial Dry Density, pcf	---	---	---	---	---	---
Percent Compaction, %	---	---	---	---	---	---
Normal Compressive Stress, psf	200	400	800	---	---	---
Peak Shear Stress, psf	146	257	388	---	---	---
Post Peak Shear Stress, psf	95.0	174	290	---	---	---
Final Moisture Content, %	---	---	---	---	---	---
Peak Secant Friction Angle, °	36.1	32.7	25.9	---	---	---
Post-Peak Secant Friction Angle, °	25.4	23.5	19.9	---	---	---

NOTES:

Peak Friction Angle:	**21.5**	**degrees**
Peak Adhesion:	**80.3**	**psf**
Post Peak Friction Angle:	**17.7**	**degrees**
Post Peak Adhesion:	**37.0**	**psf**

Figure a. Shear Force vs. Horizontal Displacement

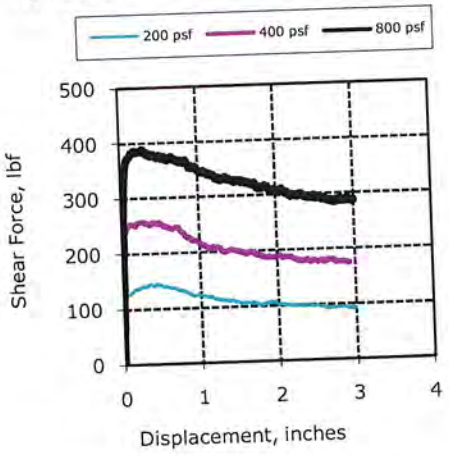
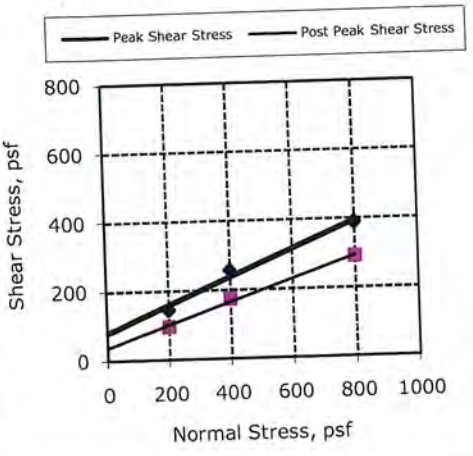


Figure b. Shear Stress vs. Normal Stress



Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679		
Start Date:	05/06/11	Tested By:	bfs
End Date:	05/06/11	Checked By:	jdt
Geosynthetic ID:	Geocomposite: 5/5/2011 Geomembrane: 5/5/2011		
Geosynthetic Description:	Black, biplanar geocomposite Black, textured geomembrane		

Interface Shear Test Series by ASTM D 5321

Test Series #:	4	
Test Profile - Top to Bottom:	textured steel plate / GEOCOMPOSITE / GEOMEMBRANE / textured steel plate	
Soil Preparation:	---	
Compaction Characteristics:	Maximum Dry Density	--- pcf
	Optimum Moisture Content	--- %
	Compaction Test Method	---
Geosynthetic Preparation:	Saturated at the normal load for 15 minutes prior to shear	
Test Equipment:	Top box = 12 in x 12 in; Bottom box = 16 in x 12 in; Load cells and LVDTs connected to data acquisition system for shear force, normal load and horizontal displacement readings; Flat plate clamping device; surface area = 144 in^2	
Horizontal Displacement, in/min:	0.2	Test Condition: inundated

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Initial Moisture Content, %	---	---	---	---	---	---
Initial Dry Density, pcf	---	---	---	---	---	---
Percent Compaction, %	---	---	---	---	---	---
Normal Compressive Stress, psf	200	400	800	---	---	---
Peak Shear Stress, psf	119	250	399	---	---	---
Post Peak Shear Stress, psf	90.0	180	285	---	---	---
Final Moisture Content, %	---	---	---	---	---	---
Peak Secant Friction Angle, °	30.7	32.0	26.5	---	---	---
Post-Peak Secant Friction Angle, °	24.2	24.2	19.6	---	---	---

NOTES:

Peak Friction Angle:	**24.4**	**degrees**
Peak Adhesion:	**44.1**	**psf**
Post Peak Friction Angle:	**17.5**	**degrees**
Post Peak Adhesion:	**37.5**	**psf**

Figure a. Shear Force vs. Horizontal Displacement

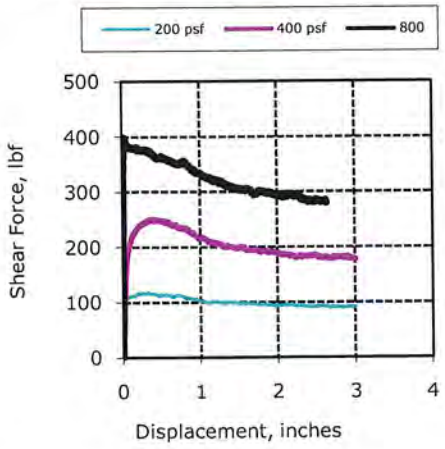
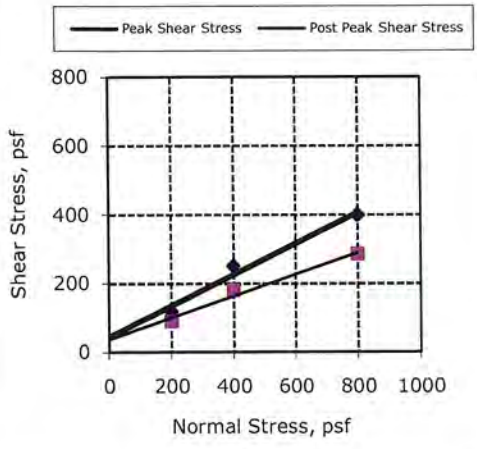


Figure b. Shear Stress vs. Normal Stress



Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

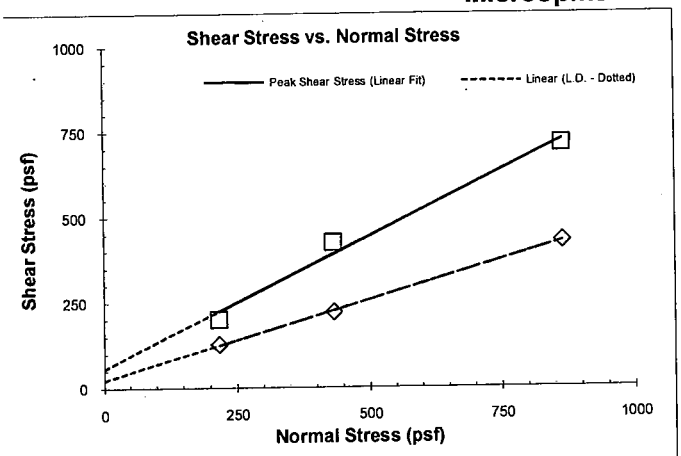
Interface Friction Test Report

Client: **New England Liner Systems**
Project: **Charlton**
Test Date: 05/19/11-05/20/11

TRI Log#: E2347-92-09
Test Method: ASTM D 5321

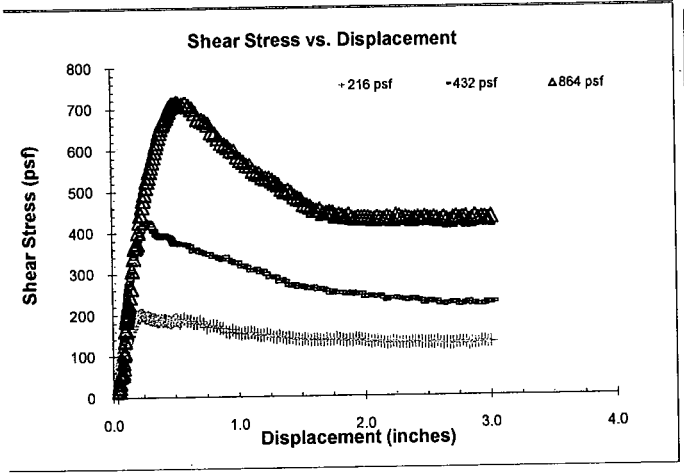
John M. Allen, P.E., 06/07/2011
Quality Review/Date

Tested Interface: GSE Double-sided Geocomposite (131364983) vs. Agru 40 mil HDPE Microspike Geomembrane



Test Results		
	Peak	**Large Displacement (@ 3.0 in.)**
Friction Angle (degrees):	**37.8**	**25.0**
Y-intercept or Adhesion (psf):	**57**	**24**

Shearing occurred at the interface.



Test Conditions

Upper Box &	GSE double-sided geocomposite
Lower Box	Agru 40 mil HDPE Microspike geomembrane (dull side)
Box Dimensions: 12"x12"x4"	
Interface Conditioning:	Interface soaked and loading applied for a minimum of 1 hour prior to shear.
Test Condition: Wet	
Shearing Rate: 0.2 inches/minute	

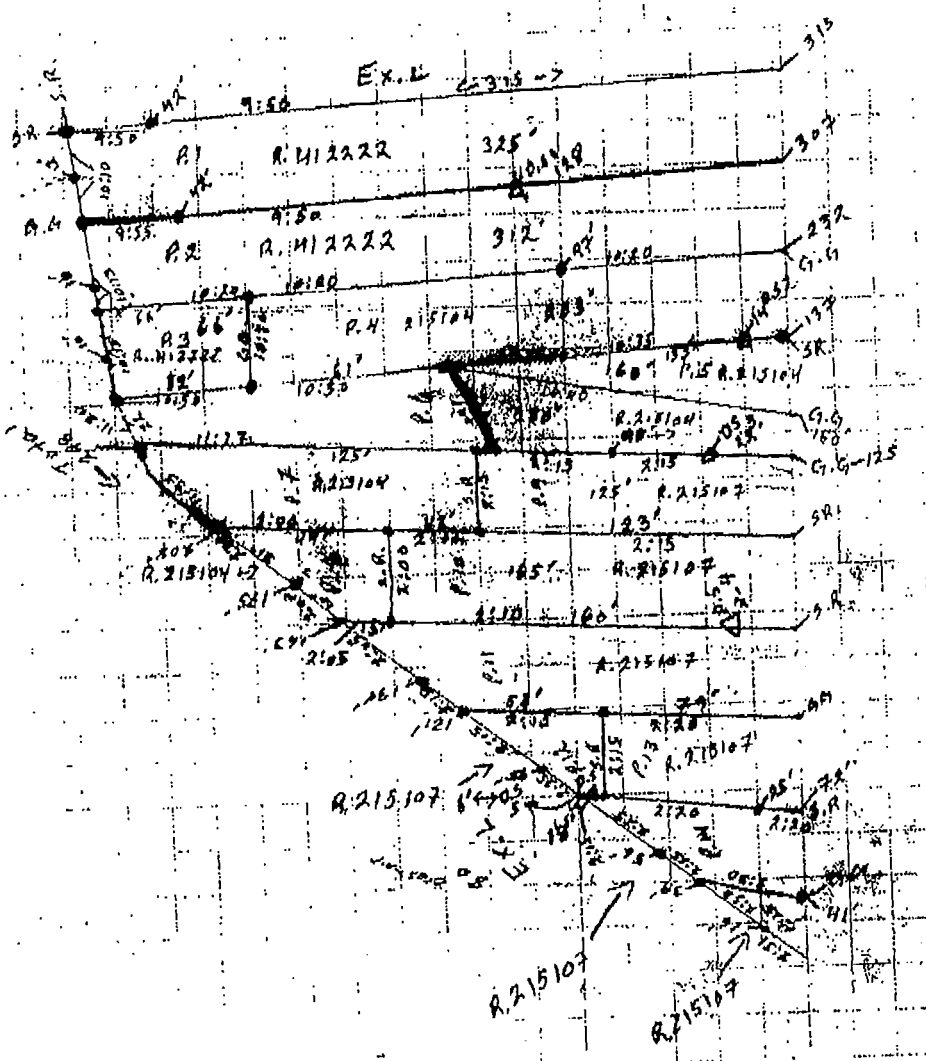
Test Data

Specimen No.	1	2	3
Bearing Slide Resistance (lbs)	10	12	16
Normal Stress (psf)	216	432	864
Corrected Peak Shear Stress (psf)	201	426	715
Corrected Large Displacement Shear Stress (psf)	128	221	429
Peak Secant Angle (degrees)	43.0	44.6	39.6
Large Displacement Secant Angle (degrees)	30.7	27.1	26.4
Asperity (mils)	27.2	27.2	26.4

9063 Bee Caves Road □ Austin, TX 78733-6201 □ (512) 263-2101 □ (512) 263-2558 □ 1-800-880-TEST

Appendix D-3
Panel Layout Plan

R.# 412222



5/26/11

Charlton Landfill
~~Charlton~~
Charlton
Charlton, Mas

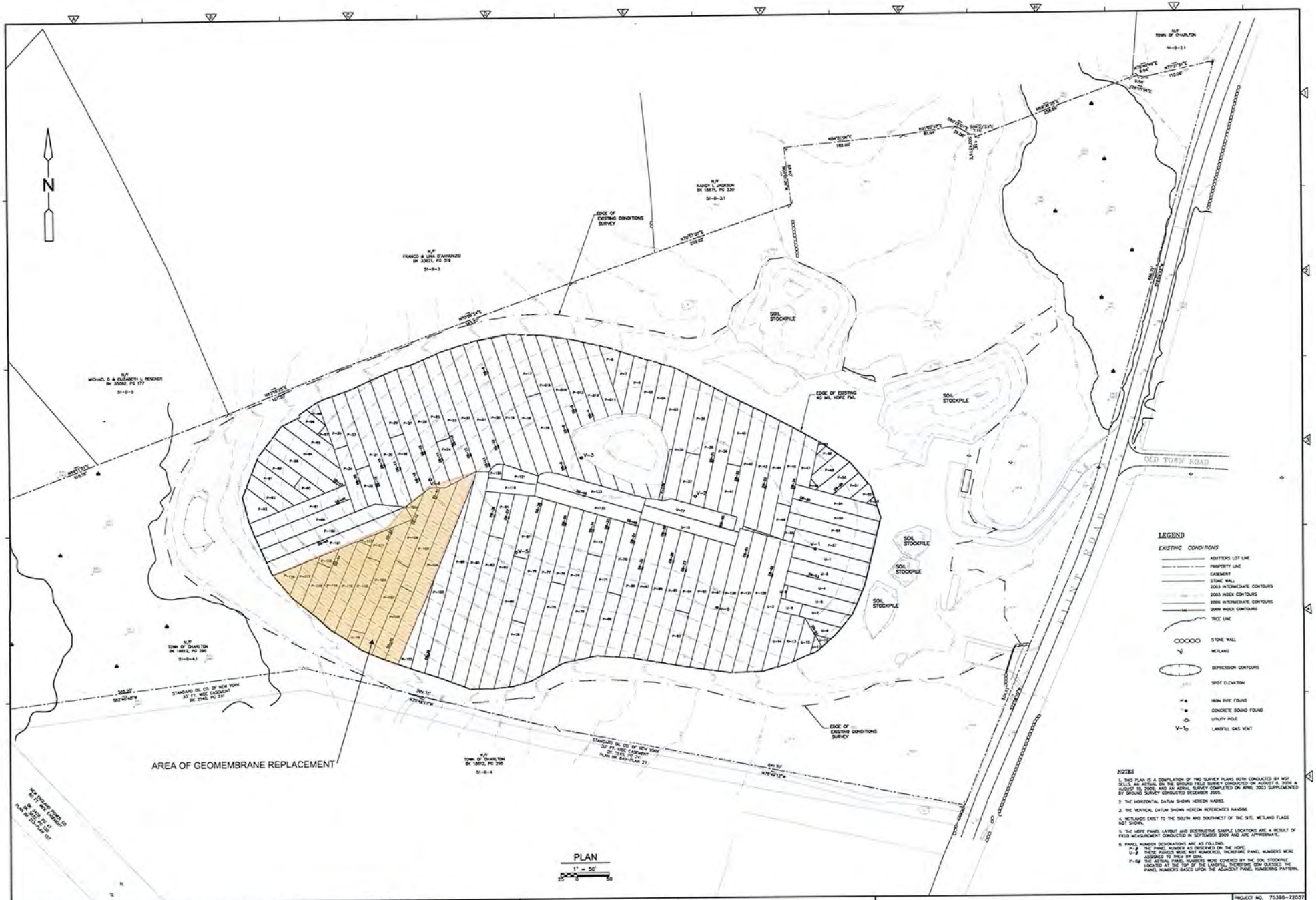
Ho Agru Hamm.

Micospike H.D.

Total S.F. = 47905

Total Lenear Ft. = 2655

Total O.S. = 5



REV NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: _____
DRAWN BY: L. BUGAT
SHEET CHK'D BY: _____
CROSS CHK'D BY: _____
APPROVED BY: _____
DATE: SEPTEMBER 2009

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting · engineering · construction · operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH
FLINT ROAD LANDFILL CLOSURE PROJECT

EXISTING 40-MIL HDPE CAP
PANEL LAYOUT PLAN

PROJECT NO. 75398-72037
FILE NAME: CSTPL001
SHEET NO.
PL-1

Appendix D-4
Trial Weld Logs

New England Liner Systems, Inc.

TRIAL WELD DATA

PROJECT: Chatham Landfill PRODUCT: Ho mill HD.
Chatham, Mas Microspike auru.

DATE	MACH. NUMBER	SEAMER INITIALS	EXTRUSION WELDER BARREL TEMP	EXTRUSION WELDER PREHEAT SETTING	FUSION WELDER WEDGE TEMP	FUSION WELDER SPEED FT/MIN	TEST MODE	TEST RESULTS IN LBS / IN SAMPLE NUMBER 1	2	3	PASS FAIL
5/25/11	405	SR			800	6	PEEL	71/82	78/81	72/93	
							SHEAR	110	108	105	
5/25/11	438	GG			800	6	PEEL	76/70	75/78	73/70	
							SHEAR	114	111	112	
5/25/11	X62	EO	425	410			PEEL	90	87	87	
							SHEAR	100	95	100	
5/25/11	405	SR.			800	6	PEEL	75/86	79/82	74/90	
							SHEAR	110	112	108	
5/25/11	438	GG			800	6.	PEEL	74/74	79/77	75/79	
							SHEAR	115	110	105	
5/25/11	X62	EO	420	400			PEEL	90	95	92	
							SHEAR	100	105	101	
5/26/11	X62	EO	420	400			PEEL	92	94	93	
							SHEAR	102	104	100	
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				
							PEEL				
							SHEAR				

Appendix D-5
Panel Placement and Seaming Logs

New England Liner Systems, Inc.

Panel Placement Form

Project: Charlton Landfill
Charlton, MA

Product: 40 mil Agru Microspike.

Date	Panel Number	Roll Number	Panel Length	Panel Width	sq. ft.	Comments
5/25/11	1	H12222	325	22	7150	
5/25/11	2	H12222	312	22	6864	
5/25/11	3	H12222	66	22	1452	
5/25/11	4	215104	233	22	5126	
5/25/11	5	215104	160	22 ÷ 2	1760	
5/25/11	6	215104	280	22	6160	
5/25/11	7	215104	125	22	2750	
5/25/11	8	215104	49	22	1078	
5/28/11	9	215107	125	22	2750	
5/25/11	10	215107	165	22	3630	
5/25/11	11	215107	175	22	3850	
5/25/11	12	215107	53	22	1166	
5/25/11	13	215107	79	22	1738	
5/25/11	14	215107	90	22	1980	
5/25/11	15	215107	41	22 ÷ 2	451	
				Total	47905	69 Ft.

Replacement Geomembrane

Appendix D-6
Non-Destructive Testing Log

New England Liner Systems, Inc.

Non Destructive Test Data

PROJECT: Charlton Landfill
Charlton, MA.

PRODUCT: 40 mil Agru. microspike.

DATE	SEAM SEGMENT	TESTER INITIALS	PRESSURE PSI START	PRESSURE PSI END	TEST TIME START	TEST TIME END	PASS FAIL	V-BOX PASS	COMMENTS
5/25/11	1/Ex.1	H.D.	30	30	9:50	9:55	P.		0'-42'
5-25-11	1/Ex.1	H.D.	30	30	9:50	9:55	P.		42'-EOS
5-25-11	2/2	H.D.	30	30	9:55	10:00	P.		0'-42'
5-25-11	1/2	H.D.	30	30	9:50	9:55	P.		42'-EOS
5-25-11	ea rep. 1/Ex.1	H.D.	30	30	10:10	10:15	P.		0'-12'
5-25-11	1/Ex.1	H.D.	30	30	10:10	10:15	P.		12'-EOS
5-25-11	2/Ex.1	H.D.	30	30	10:13	10:18	P.		0'-16'
5-25-11	2/Ex.1	H.D.	30	30	10:13	10:18	P.		16'-EOS
5-25-11	2/3	H.D.	30	30	10:20	10:25	P.		0'-EOS
5-25-11	2/4	H.D.	30	30	10:20	10:25	P.		0'-97'
5-25-11	2/4	H.D.	30	30	10:20	10:25	P.		97'-EOS
5-25-11	3/Ex.1	H.D.	30	30	10:15	10:20	P.		0'-10'
5-25-11	3/Ex.1	H.D.	30	30	10:15	10:20	P.		10'-EOS
5-25-11	3/4	H.D.	30	30	10:30	10:35	P.		0'-EOS
5-25-11	3/6	H.D.	30	30	10:50	10:55	P.		0'-EOS
5-25-11	4/6	H.D.	30	30	10:50	10:55	P.		0'-EOS
5-25-11	4/5	H.D.	30	30	10:35	10:40	P.		0'-EOS
5-25-11	4/5	H.D.						P.	84' Ex. 4
5-25-11	5/6	H.D.	30	30	10:40	10:45	P.		0'-EOS
5-25-11	6/Ex.6	H.D.	30	30	11:20	11:25	P.		0'-EOS.
5-25-11	6/7	H.D.	30	30	11:27	11:32	P.		0'-EOS
5-25-11	6/9	H.D.	30	30	2:15	2:20	P.		0'-98'
5-25-11	6/9	H.D.	30	30	2:15	2:20	P.		98'-EOS
5-25-11	7/9	H.D.	30	30	2:15	2:20	P.		0'-EOS
5-25-11	7/8	H.D.	30	30	2:00	2:05	P.		0'-EOS
5-25-11	7/10	H.D.	30	30	2:00	2:05	P.		0'-EOS
5-25-11	9/10	H.D.	30	30	2:15	2:20	P.		0'-EOS
5-25-11	8/10	H.D.	30	30	2:00	2:05	P.		0'-EOS
5-25-11	8/11	H.D.	30	30	2:05	2:10	P.		0'-EOS
5-25-11	10/11	H.D.	30	30	2:10	2:15	P.		0'-EOS
5-25-11	11/12	H.D.	30	30	2:15	2:20	P.		0'-EOS
5-25-11	11/13	H.D.	30	30	2:20	2:25	P.		0'-EOS
5-25-11	12/13	H.D.	30	30	2:15	2:20	P.		0'-EOS
5-25-11	12/14	H.D.	30	30	2:15	2:20	P.		0'-EOS
5-25-11	13/14	H.D.	30	30	2:20	2:25	P.		0'-25'
5-25-11	13/14	H.D.	30	30	2:20	2:25	P.		25'-EOS
5-25-11	14/15	H.D.	30	30	2:30	2:35	P.		0'-EOS.
5-25-11	15/Ex.1	H.D.	30	30	2:31	2:36	P.		0'-16'
5-25-11	12/Ex.1	H.D.	30	30	2:30	2:35	P.		16'-39'
5-25-11	14/Ex.1	H.D.	30	30	2:25	2:30	P.		39'-56'
5-25-11	14/Ex.1	H.D.	30	30	2:25	2:30	P.		56'-80
5-25-11	12/Ex.1	H.D.	30	30	2:25	2:30	P.		80'-95'
5-25-11	12/Ex.1	H.D.	30	30	2:15	2:20	P.		95'-121'
5-25-11	11/Ex.1	H.D.	30	30	2:10	2:15			121'-134'
5-25-11	11/Ex.1	H.D.	30	30	2:05	2:10			134'-163'

Replacement Geomembrane

New England Liner Systems, Inc.

Non Destructive Test Data

PROJECT: Charlton Landfill
Charlton, Ma.

PRODUCT: 40 mil Agru microspike.

DATE	SEAM SEGMENT	TESTER INITIALS	PRESSURE PSI START	PRESSURE PSI END	TEST TIME START	TEST TIME END	PASS FAIL	V-BOX PASS	COMMENTS
5-25-11	8/Ext. 2	H.D.	30	30	2:00	2:05	P.		167' - 175'
5-25-11	8/Ext. 2	H.D.	30	30	2:00	2:05	P.		175' - 205'
5-25-11	7/Ext. 1	H.D.	30	30	11:35	11:40			208' - EOS

Replacement Geomembrane

Appendix D-7
Field and Laboratory Destructive Testing Results

New England Liner Systems, Inc. **Destructive Test Log**

PROJECT: ~~Chalton~~ charlton Landfill
~~Chalton~~ charlton. MA
charlton

PRODUCT: 40 mil HD. Microspike
Agru

DATE	SAMPLE ID #	SEAM NUMBER	MACHINE NUMBER	SEAMER INITIALS	TEST MODE	TEST RESULTS IN LBS / IN SAMPLE NUMBER 1	2	3	4	5	PASS FAIL
5/26/11	1	1/2	488	GG	PEEL	82/82	65/80	96/80	90/79	69/80	P.
					SHEAR	135	120	115	127	130	P.
5/26/11	2	4/5	405	S.R.	PEEL	92/94	97/96	100/89	93/88	94/89	P.
					SHEAR	122	119	120	123	118	P.
5/26/11	3	6/9	488	GG	PEEL	112/90	92/108	94/110	92/100	89/98	P.
					SHEAR	134	133	128	130	131	P.
5/26/11	4	10/11	405	SR.	PEEL	105/90	106/91	93/90	106/92	91/93	P.
					SHEAR	127	130	122	125	120	P.
5/26/11	5	12/14	405	SR.	PEEL	97/86	86/81	109/93	89/99	100/90	P.
					SHEAR	143	147	138	140	141	P.
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						
					PEEL						
					SHEAR						

Replacement Geomembrane

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Charlton Landfill		
Project Location:	---		
Installer:	---		
GTX #:	10850		
Test Date:	05/27/11		
Tested By:	bfs	Report #:	1
Checked By:	jdt	Page:	1 of 5

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	40 mil textured microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil textured microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-1	Machine ID:	438
Seam ID:	1/2	Welder ID:	GG
		Date Sampled:	05/26/11

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	68	---	SE1	84	---	SE1	117	>50%	lower
2	74	---	SE1	77	---	SE1	117	>50%	lower
3	92	---	SE1	81	---	SE1	117	>50%	lower
4	70	---	SE1	76	---	SE1	116	>50%	lower
5	66	---	SE1	85	---	SE1	117	>50%	lower
Average	74	---	---	80	---	---	117	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Charlton Landfill		
Project Location:	---		
Installer:	---		
GTX #:	10850		
Test Date:	05/27/11		
Tested By:	bfs	Report #:	1
Checked By:	jdt	Page:	2 of 5

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	40 mil textured microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil textured microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-2	Machine ID:	405
Seam ID:	4/5	Welder ID:	SR
		Date Sampled:	05/26/11

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	103	---	SE1	95	---	SE1	117	>50%	lower
2	94	---	SE1	95	---	SE1	118	>50%	lower
3	103	---	SE1	90	---	SE1	118	>50%	lower
4	96	---	SE1	90	---	SE1	117	>50%	lower
5	106	---	SE1	96	---	SE1	119	>50%	lower
Average	100	---	---	93	---	---	118	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	New England Liner Systems
Project Name:	Charlton Landfill
Project Location:	---
Installer:	---
GTX #:	10850
Test Date:	05/27/11
Tested By:	bfs
Checked By:	jdt

Report #: 1

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	40 mil textured microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil textured microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-3	Machine ID:	438
Seam ID:	6/9	Welder ID:	GG
		Date Sampled:	05/26/11

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	92	---	SE1	102	---	SE1	141	>50%	lower
2	89	---	SE1	103	---	SE1	139	>50%	lower
3	80	---	SE1	108	---	SE1	140	>50%	upper
4	79	---	SE1	95	---	SE1	140	>50%	lower
5	108	---	SE1	93	---	SE1	143	>50%	lower
Average	90	---	---	100	---	---	141	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Charlton Landfill		
Project Location:	---		
Installer:	---		
GTX #:	10850		
Test Date:	05/27/11		
Tested By:	bfs	Report #:	1
Checked By:	jdt	Page:	4 of 5

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	40 mil textured microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil textured microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-4	Machine ID:	405
Seam ID:	4/6	Welder ID:	sr
		Date Sampled:	05/26/11

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	109	---	SE1	93	---	SE1	142	>50%	lower
2	106	---	SE1	96	---	SE1	141	>50%	lower
3	115	---	SE1	104	---	SE1	141	>50%	lower
4	111	---	SE1	111	---	SE1	140	>50%	lower
5	107	---	SE1	110	---	SE1	141	>50%	lower
Average	109	---	---	103	---	---	141	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Charlton Landfill		
Project Location:	---		
Installer:	---		
GTX #:	10850		
Test Date:	05/27/11		
Tested By:	bfs	Report #:	1
Checked By:	jdt	Page:	5 of 5

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D 6392

peel & shear destructive test

Upper Geomembrane:	40 mil textured microspike HDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	60 mil textured microspike HDPE	Testing Speed:	2 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DS-5	Machine ID:	405
Seam ID:	12/14	Welder ID:	SR
		Date Sampled:	05/26/11

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	96	---	SE1	96	---	SE1	141	>50%	lower
2	94	---	SE1	94	---	SE1	141	>50%	upper
3	97	---	SE1	97	---	SE1	141	>50%	lower
4	101	---	SE1	101	---	SE1	143	>50%	lower
5	94	---	SE1	94	---	SE1	143	>50%	lower
Average	97	---	---	96	---	---	142	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Appendix D-8
Repair Logs

New England Liner Systems, Inc.

Repair Report

PROJECT: Charlton Landfill
Charlton MA.

PRODUCT: 40 mil Agru
microspike

Repair Date	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test Pass/Fail	Location Comments
5/25/11	1/Ex.1.		E.O	X62	P.	48' from Top.
5/25/11	Ex. Ex. 1		E.O	X62	P.	from C.S
5/25/11	1/Ex.1		E.O	X62	P.	12' from C.S.
5/25/11	1, 2/Ex.1		E.O	X62	P.	T.I
5/25/11	1/2		E.O	X62	P.	48' from Top.
5/25/11	1/2		E.O	X62	P.	O.S. 1 128' from bottom
5/25/11	2/Ex.1, Ex.1		E.O	X62	P.	T.I
5/25/11	2/3, Ex.1		E.O	X62	P.	T.I
5/25/11	2/3/4		E.O	X62	P.	C.S
5/25/11	2/4		E.O	X62	P.	97' from bottom
5/25/11	3/Ex.1, Ex.1		E.O	X62	P.	T.I
5/25/11	3,6/Ex.1		E.O	X62	P.	T.I
5/25/11	3,6/4		E.O	X62	P.	C.S
5/25/11		6	E.O	X62	P.	61' from C.S. cap.
5/25/11	6,4/5		E.O	X62	P.	C.S
5/25/11	4/5		E.O	X62	P.	O.S. 2 14' from bottom
5/25/11	Ex.1/6,7		E.O	X62	P.	T.I
5/25/11	6,7/9		E.O	X62	P.	C.S
5/25/11	9/6		E.O	X62	P.	96' from Top.
5/25/11	9/6		E.O	X62	P.	O.S. 3 22' from bottom
5/25/11	7/8, Ex.1		E.O	X62	P.	T.I
5/25/11	7/8, 10		E.O	X62	P.	C.S
5/25/11	7,9/10		E.O	X62	P.	C.S
5/25/11	8, Ex.1/Ex.1		E.O	X62	P.	T.I
5/25/11	8, 11/Ex.1		E.O	X62	P.	T.I
5/25/11	8, 10/11		E.O	X62	P.	C.S.
5/26/11	10/11		E.O	X62	P.	O.S. 4 7' from bottom.
5/26/11	11/Ex.1/Ex.1		E.O	X62	P	T.I
5/26/11	11/12, Ex.1		E.O	X62	P.	T.I
5/26/11	11/12, 13		E.O	X62	P.	C.S
5/26/11	12, Ex.1/Ex.1		E.O	X62	P.	T.I
5/26/11	12, 14/Ex.1		E.O	X62	P.	T.I
5/26/11	12/14		E.O	X62	P.	O.S. 5 6' from C.S
5/26/11	12/14, 13		E.O	X62	P.	C.S
5/26/11	13/14		E.O	X62	P.	25' from bottom
5/26/11	14/Ex.1, Ex.1		E.O	X62	P.	T.I
5/26/11	14/15, Ex.1		E.O	X62	P.	T.I
5/26/11	14/15		E.O	X62	P.	Begining of S on bottom.
5/26/11	15/Ex.1, Ex.1		E.O	X62	P.	T.I
5/26/11	1, 2, 4, 5, 6, 9, 10, 11, 13, 14, 15		E.O	X62	P.	T.I on top
5/26/11	Ex.1		E.O.	X62	P.	T.I bottom

Replacement Geomembrane

Appendix E

Drainage Geocomposite Source and Conformance Testing

The Pioneer Of Geosynthetics

SINCE 1972

Product Data Sheet

GSE FabriNet HS Geocomposite

GSE FabriNet HS geocomposite consists of a 275 mil thick GSE HyperNet HS geonet heat-laminated on one or both sides with a GSE nonwoven needlepunched geotextile. The geotextile is available in mass per unit area range of 6 oz/yd^2 (200 g/m^2) to 16 oz/yd^2 (540 g/m^2). The geocomposite is designed and formulated to perform drainage function under a range of anticipated site loads, gradients and boundary conditions.

Product Specifications

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE VALUE[1]		
Geocomposite			6 oz/yd^2	8 oz/yd^2	10 oz/yd^2
Transmissivity[2], gal/min/ft (m^2/sec)	ASTM D 4716	1/540,000 ft^2			
Double-Sided Composite			3.4 (7 x 10^{-4})	3.4 (7 x 10^{-4})	2.4 (5 x 10^{-4})
Single-Sided Composite			9.6 (2 x 10^{-3})	9.6 (2 x 10^{-3})	7.2 (1.5 x 10^{-3})
Ply Adhesion, lb/in (g/cm)	ASTM D 7005	1/50,000 ft^2	1.0 (178)	1.0 (178)	1.0 (178)
Geonet Core[3] - GSE HyperNet HS					
Transmissivity[2], gal/min/ft (m^2/sec)	ASTM D 4716		28.98 (6 x 10^{-3})	28.98 (6 x 10^{-3})	28.98 (6 x 10^{-3})
Density, g/cm^3	ASTM D 1505	1/50,000 ft^2	0.94	0.94	0.94
Tensile Strength (MD), lb/in (N/mm)	ASTM D 5035/7179	1/50,000 ft^2	65 (11.5)	65 (11.5)	65 (11.5)
Carbon Black Content, %	ASTM D 1603*/4218	1/50,000 ft^2	2.0	2.0	2.0
Geotextile[3,4]					
Mass per Unit Area, oz/yd^2(g/m^2)	ASTM D 5261	1/90,000 ft^2	6 (200)	8 (270)	10 (335)
Grab Tensile, lb (N)	ASTM D 4632	1/90,000 ft^2	160 (710)	220 (975)	260 (1,155)
Puncture Strength, lb (N)	ASTM D 4833	1/90,000 ft^2	90 (395)	120 (525)	165 (725)
AOS, US sieve (mm)	ASTM D 4751	1/540,000 ft^2	70 (0.212)	80 (0.180)	100 (0.150)
Permittivity, (sec^{-2})	ASTM D 4491	1/540,000 ft^2	1.5	1.3	1.0
Flow Rate, gpm/ft^2 (lpm/m^2)	ASTM D 4491	1/540,000 ft^2	110 (4,480)	95 (3,865)	75 (3,050)
UV Resistance, % retained	ASTM D 4355 (after 500 hours)	once per formulation	70	70	70
NOMINAL ROLL DIMENSIONS					
Geonet Core Thickness, mil (mm)	ASTM D 5199	1/50,000 ft^2	275 (7)	275 (7)	275 (7)
Roll Width[5], ft (m)			15 (4.5)	15 (4.5)	15 (4.5)
Roll Length[5], ft (m)	Double-Sided Composite		212 (64.6)	200 (61.0)	190 (57.9)
	Single-Sided Composite		240 (73.2)	240 (73.2)	230 (70.1)
Roll Area, ft^2 (m^2)	Double-Sided Composite		3,180 (295)	3,000 (279)	2,850 (265)
	Single-Sided Composite		3,600 (334)	3,600 (334)	3,450 (321)

NOTES:

- [1]AOS in mm is a maximum value.
- [2]Gradient of 0.1, normal load of 10,000 psf, water at 70°F between steel plates for 15 minutes. Contact GSE for performance transmissivity value for use in design.
- [3]Component properties prior to lamination.
- [4]Refer to geotextile product data sheet for additional specifications.
- [5]Roll widths and lengths have a tolerance of ±1%.
- *Modified.

DS8FNNS R01/13/10

Report Date
8/21/2012

Quality Assurance Laboratory Test Results

Job Name: Flint Road Landfill
Sales Order: 64068

Required Testing: ASTM D 3895 -- Standard Test Method for Oxidative Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D 5397 -- Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test

Frequency: D 3895 -- 1/Resin Lot
D 5397 -- Certify

Criteria: D 3895 -- 140 Minutes
D 5397 -- 1000 Hours

Product Code	Resin Lot Number	Test Results
HDT-040GE-BBB-B-W0	8201127	PASS

Approved By: Lana Hickman
Date Approved: March 31, 2011

Geocomposite Traceability

Order: SO-064068
Customer: New England Liner Systems
Project Name: Flint Road

Roll#	Product	Resin Lot	Top Geo	Bottom Geo
131364795	FS2-275E-08-08-E-00	CB11022601	130392528	130392525
131364796	FS2-275E-08-08-E-00	CB11022601	130392528	130392525
131364797	FS2-275E-08-08-E-00	CB11022601	130392528	130392525
131364798	FS2-275E-08-08-E-00	CB11022601	130392528	130392525
131364799	FS2-275E-08-08-E-00	CB11022601	130392528	130392525
131364800	FS2-275E-08-08-E-00	CB11022601	130392528	130392525
131364801	FS2-275E-08-08-E-00	CB11022601	130392527	130392524
131364802	FS2-275E-08-08-E-00	CB11022601	130392527	130392524
131364803	FS2-275E-08-08-E-00	CB11022601	130392527	130392524
131364804	FS2-275E-08-08-E-00	CB11022601	130392527	130392524
131364805	FS2-275E-08-08-E-00	CB11022601	130392527	130392524
131364806	FS2-275E-08-08-E-00	CB11022601	130392527	130392524
131364807	FS2-275E-08-08-E-00	CB11022601	130392532	130392535
131364808	FS2-275E-08-08-E-00	CB11022601	130392532	130392535
131364809	FS2-275E-08-08-E-00	CB11022601	130392532	130392535
131364810	FS2-275E-08-08-E-00	CB11022601	130392532	130392535
131364811	FS2-275E-08-08-E-00	CB11022601	130392532	130392535
131364812	FS2-275E-08-08-E-00	CB11022601	130392532	130392535
131364813	FS2-275E-08-08-E-00	CB11022601	130392532	130392535
131364814	FS2-275E-08-08-E-00	CB11022601	130392538	130392534
131364815	FS2-275E-08-08-E-00	CB11022601	130392538	130392534
131364816	FS2-275E-08-08-E-00	CB11022601	130392538	130392534
131364817	FS2-275E-08-08-E-00	CB11022601	130392538	130392534
131364818	FS2-275E-08-08-E-00	CB11022601	130392538	130392534
131364820	FS2-275E-08-08-E-00	CB11022601	130392538	130392534
131364821	FS2-275E-08-08-E-00	CB11022601	130392538	130392534
131364822	FS2-275E-08-08-E-00	CB11022601	130392539	130392540
131364823	FS2-275E-08-08-E-00	CB11022601	130392539	130392540
131364824	FS2-275E-08-08-E-00	CB11022601	130392539	130392540
131364825	FS2-275E-08-08-E-00	CB11022601	130392539	130392540
131364826	FS2-275E-08-08-E-00	CB11022601	130392539	130392540
131364827	FS2-275E-08-08-E-00	CB11022601	130392539	130392540
131364828	FS2-275E-08-08-E-00	CB11022601	130392539	130392540
131364829	FS2-275E-08-08-E-00	CB11022601	130392529	130392521
131364830	FS2-275E-08-08-E-00	CB11022601	130392529	130392521
131364831	FS2-275E-08-08-E-00	CB11022601	130392529	130392521
131364832	FS2-275E-08-08-E-00	CB11022601	130392529	130392521
131364833	FS2-275E-08-08-E-00	CB11022601	130392529	130392521
131364834	FS2-275E-08-08-E-00	CB11022601	130392529	130392521
131364835	FS2-275E-08-08-E-00	CB11022601	130392529	130392521
131364836	FS2-275E-08-08-E-00	CB11022601	130392533	130392522
131364837	FS2-275E-08-08-E-00	CB11022601	130392533	130392522
131364838	FS2-275E-08-08-E-00	CB11022601	130392533	130392522
131364839	FS2-275E-08-08-E-00	CB21030701	130392533	130392522
131364840	FS2-275E-08-08-E-00	CB21030701	130392533	130392522
131364841	FS2-275E-08-08-E-00	CB21030701	130392533	130392522
131364842	FS2-275E-08-08-E-00	CB21030701	130392533	130392522
131364843	FS2-275E-08-08-E-00	CB21030701	130392531	130392517
131364844	FS2-275E-08-08-E-00			

131364845	FS2-275E-08-08-E-00	CB21030701	130392531	130392517
131364846	FS2-275E-08-08-E-00	CB21030701	130392531	130392517
131364847	FS2-275E-08-08-E-00	CB21030701	130392531	130392517
131364848	FS2-275E-08-08-E-00	CB21030701	130392531	130392517
131364849	FS2-275E-08-08-E-00	CB21030701	130392531	130392517
131364850	FS2-275E-08-08-E-00	CB21030701	130392531	130392517
131364851	FS2-275E-08-08-E-00	CB21030701	130392526	130392530
131364852	FS2-275E-08-08-E-00	CB21030701	130392526	130392530
131364853	FS2-275E-08-08-E-00	CB21030701	130392526	130392530
131364854	FS2-275E-08-08-E-00	CB21030701	130392526	130392530
131364855	FS2-275E-08-08-E-00	CB21030701	130392526	130392530
131364856	FS2-275E-08-08-E-00	CB21030701	130392526	130392530
131364857	FS2-275E-08-08-E-00	CB21030701	130392526	130392530
131364858	FS2-275E-08-08-E-00	CB21030701	130392536	130392520
131364859	FS2-275E-08-08-E-00	CB21030701	130392536	130392520
131364860	FS2-275E-08-08-E-00	CB21030701	130392536	130392520
131364861	FS2-275E-08-08-E-00	CB21030701	130392536	130392520
131364862	FS2-275E-08-08-E-00	CB21030701	130392536	130392520
131364863	FS2-275E-08-08-E-00	CB21030701	130392536	130392520
131364864	FS2-275E-08-08-E-00	CB21030701	130392536	130392520
131364865	FS2-275E-08-08-E-00	CB21030701	130392523	130392519
131364866	FS2-275E-08-08-E-00	CB21030701	130392523	130392519
131364867	FS2-275E-08-08-E-00	CB21030701	130392523	130392519
131364868	FS2-275E-08-08-E-00	CB21030701	130392523	130392519
131364869	FS2-275E-08-08-E-00	CB21030701	130392523	130392519
131364870	FS2-275E-08-08-E-00	CB21030701	130392523	130392519
131364871	FS2-275E-08-08-E-00	CB21030701	130392523	130392519
131364872	FS2-275E-08-08-E-00	CB21030701	130392523	130392518
131364873	FS2-275E-08-08-E-00	CB21030701	130392537	130392518
131364874	FS2-275E-08-08-E-00	CB21030701	130392537	130392518
131364875	FS2-275E-08-08-E-00	CB21030701	130392537	130392518
131364876	FS2-275E-08-08-E-00	CB21030701	130392537	130392518
131364877	FS2-275E-08-08-E-00	CB21030701	130392537	130392518
131364878	FS2-275E-08-08-E-00	CB21030701	130392537	130392518
131364879	FS2-275E-08-08-E-00	CB21030701	130392537	130392518
131364880	FS2-275E-08-08-E-00	CB21030701	130392545	130392555
131364881	FS2-275E-08-08-E-00	CB21030701	130392545	130392555
131364882	FS2-275E-08-08-E-00	CB21030701	130392545	130392555
131364883	FS2-275E-08-08-E-00	CB21030701	130392545	130392555
131364884	FS2-275E-08-08-E-00	CB21030701	130392545	130392555
131364885	FS2-275E-08-08-E-00	CB21030701	130392545	130392555

Report Date
8/21/2012

Quality Assurance Laboratory Test Results

Job Name: NELS Stock
Sales Order: 64087

Required Testing: ASTM D 3895 -- Standard Test Method for Oxidative Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D 5397 -- Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test

Frequency: D 3895 -- 1/Resin Lot
D 5397 -- Certify

Criteria: D 3895 -- 140 Minutes
D 5397 -- 1000 Hours

Product Code	Resin Lot Number	Test Results
HDT-040GE-BBB-B-W0	8201127	PASS

Approved By: Jeff Theobald
Date Approved: March 30, 2011

1245 Eastland Avenue
Kingstree, SC 29556
Phone 843-382-4603
Fax 843-382-4604

Date: March 29, 2011

Project: # 64068 Flint Road Landfill

Ref: Ultraviolet (UV) Resistance

To Whom It May Concern:

The resistance of nonwoven needle punched geotextiles to ultraviolet light depends primarily on antioxident and carbon black package mixed with resin to prepare a formulation for fiber extrusion. As long as this formulation remains the same the UV resistance of a geotextiles does not change. Therefore, GSE performs UV testing only once per resin formulation. The testing is performed according to ASTM Test Method D 4355 and results are included on GSE geotextile specification sheet. Currently, all GSE geotextiles meet or exceed a value of 70% strength retained after 500 hours of UV exposure. GSE will meet or exceed this value for the referenced project.

Although GSE geotextiles are manufactured using one of the best available antioxident packages, we recommend covering the geotextiles within 15 days of exposure to direct Sunlight. This period does not include time during which geotextiles rolls remain on site covered in black shrink-wrap. Our recommendation is based on UV performance data published in technical literature indicating geotextile strength can decrease sharply after prolonged exposure to Sunlight.

Actual data from an independent laboratory can be supplied upon request.

Jane Allen
Laboratory Manager

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/30/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	MA Charlton US	FBR-080E-EBC-E-00	

Roll Number	ASTM D5261 Mass per Unit Area (oz/yd²)	ASTM D4491 Water Flow Rate (gpm/ft²)	ASTM D4491 Permittivity (sec-1)	ASTM D4751 AOS (mm)	ASTM D4632 Grab Strength (lbs) MD	ASTM D4632 Grab Strength (lbs) TD	ASTM D4632 Grab Elongation (%) MD	ASTM D4632 Grab Elongation (%) TD	ASTM D4533 Trapezoidal Tear (lbs) MD	ASTM D4533 Trapezoidal Tear (lbs) TD	Puncture Resistance ASTM D4833(lbs)
130377051	9.0	95	1.30	0.180	250	341	105	128	136	144	159
130377411	8.2	115	1.60	0.180	232	260	95	124	144	134	141
130390463	8.3	110	1.50	0.180	246	295	97	105	132	192	126
130390464	9.1	110	1.50	0.180	267	301	104	112	147	227	138
130392517	9.7	115	1.50	0.180	270	238	96	122	156	266	168
130392518	8.5	110	1.46	0.180	243	288	89	125	164	190	135
130392519	8.5	110	1.46	0.180	243	288	89	125	164	190	135
130392520	8.5	110	1.46	0.180	243	288	89	125	164	190	135
130392521	8.5	110	1.46	0.180	243	288	89	125	164	190	135
130392522	8.7	110	1.46	0.180	240	289	90	122	148	204	159
130392523	8.7	110	1.46	0.180	240	289	90	122	148	204	159
130392524	8.7	110	1.46	0.180	240	289	90	122	148	204	159
130392525	8.7	110	1.46	0.180	240	289	90	122	148	204	159
130392526	8.1	110	1.46	0.180	223	284	93	120	157	238	132
130392527	8.1	110	1.46	0.180	223	284	93	120	157	238	132
130392528	8.1	110	1.46	0.180	223	284	93	120	157	238	132
130392529	8.1	110	1.46	0.180	223	284	93	120	157	238	132
130392530	8.3	110	1.46	0.180	238	277	98	122	165	239	136
130392531	8.3	110	1.46	0.180	238	277	98	122	165	239	136
130392532	8.3	110	1.46	0.180	238	277	98	122	165	239	136
130392533	8.3	110	1.46	0.180	238	277	98	122	165	239	136
130392534	8.4	110	1.46	0.180	230	295	100	113	167	235	132
130392535	8.4	110	1.46	0.180	230	295	100	113	167	235	132
130392536	8.4	110	1.46	0.180	230	295	100	113	167	235	132
130392537	8.4	110	1.46	0.180	230	295	100	113	167	235	132
130392538	8.6	110	1.46	0.180	236	270	98	115	146	187	143
130392539	8.6	110	1.46	0.180	236	270	98	115	146	187	143
130392540	8.6	110	1.46	0.180	236	270	98	115	146	187	143
130392541	8.6	110	1.46	0.180	236	270	98	115	146	187	143
130392542	8.7	101	1.40	0.180	236	286	93	122	118	176	149
130392543	8.7	101	1.40	0.180	236	286	93	122	118	176	149
130392544	8.7	101	1.40	0.180	236	286	93	122	118	176	149
130392545	8.7	101	1.40	0.180	236	286	93	122	118	176	149
130392546	9.0	101	1.40	0.180	231	288	100	127	152	216	144

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/30/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	MA Charlton US	FBR-080E-EBC-E-00	

Roll Number	ASTM D5261 Mass per Unit Area (oz/yd²)	ASTM D4491 Water Flow Rate (gpm/ft²)	ASTM D4491 Permittivity (sec-1)	ASTM D4751 AOS (mm)	ASTM D4632 Grab Strength (lbs) MD	ASTM D4632 Grab Strength (lbs) TD	ASTM D4632 Grab Elongation (%) MD	ASTM D4632 Grab Elongation (%) TD	ASTM D4533 Trapezoidal Tear (lbs) MD	ASTM D4533 Trapezoidal Tear (lbs) TD	Puncture Resistance ASTM D4833(lbs)
130392547	9.0	101	1.40	0.180	231	288	100	127	152	216	144
130392548	9.0	101	1.40	0.180	231	288	100	127	152	216	144
130392549	9.0	101	1.40	0.180	231	288	100	127	152	216	144
130392550	9.2	101	1.40	0.180	235	306	103	137	134	188	141
130392552	9.2	101	1.40	0.180	235	306	103	137	134	188	141
130392553	9.2	101	1.40	0.180	235	306	103	137	134	188	141
130392554	8.6	101	1.40	0.180	270	310	94	111	199	246	156
130392555	8.6	101	1.40	0.180	270	310	94	111	199	246	156
130392556	8.6	101	1.40	0.180	270	310	94	111	199	246	156
130392557	8.6	101	1.40	0.180	270	310	94	111	199	246	156

Laboratory Manager Jane Allen

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/29/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	MA Charlton US	FBR-080E-EBC-E-00	

Roll Number	ASTM D5261 Mass per Unit Area (oz/yd²)	ASTM D4491 Water Flow Rate (gpm/ft²)	ASTM D4491 Permittivity (sec-1)	ASTM D4751 AOS (mm)	ASTM D4632 Grab Strength (lbs) MD	ASTM D4632 Grab Strength (lbs) TD	ASTM D4632 Grab Elongation (%) MD	ASTM D4632 Grab Elongation (%) TD	ASTM D4533 Trapezoidal Tear (lbs) MD	ASTM D4533 Trapezoidal Tear (lbs) TD	Puncture Resistance ASTM D4833(lbs)
130392517	9.7	115	1.50	0.180	270	238	96	122	156	266	168
130392518	8.5	110	1.46	0.180	243	288	89	125	164	190	135
130392519	8.5	110	1.46	0.180	243	288	89	125	164	190	135
130392520	8.5	110	1.46	0.180	243	288	89	125	164	190	135
130392521	8.5	110	1.46	0.180	243	288	89	125	164	190	135
130392522	8.7	110	1.46	0.180	240	289	90	122	148	204	159
130392523	8.7	110	1.46	0.180	240	289	90	122	148	204	159
130392524	8.7	110	1.46	0.180	240	289	90	122	148	204	159
130392525	8.7	110	1.46	0.180	240	289	90	122	148	204	159
130392526	8.1	110	1.46	0.180	223	284	93	120	157	238	132
130392527	8.1	110	1.46	0.180	223	284	93	120	157	238	132
130392528	8.1	110	1.46	0.180	223	284	93	120	157	238	132
130392529	8.1	110	1.46	0.180	223	284	93	120	157	238	132
130392530	8.3	110	1.46	0.180	238	277	98	122	165	239	136
130392531	8.3	110	1.46	0.180	238	277	98	122	165	239	136
130392532	8.3	110	1.46	0.180	238	277	98	122	165	239	136
130392533	8.3	110	1.46	0.180	238	277	98	122	165	239	136
130392534	8.4	110	1.46	0.180	230	295	100	113	167	235	132
130392535	8.4	110	1.46	0.180	230	295	100	113	167	235	132
130392536	8.4	110	1.46	0.180	230	295	100	113	167	235	132
130392537	8.4	110	1.46	0.180	230	295	100	113	167	235	132
130392538	8.6	110	1.46	0.180	236	270	98	115	146	187	143
130392539	8.6	110	1.46	0.180	236	270	98	115	146	187	143
130392540	8.6	110	1.46	0.180	236	270	98	115	146	187	143
130392545	8.7	101	1.40	0.150	236	286	93	122	118	176	149
130392555	13.6	101	1.40	0.150	384	487	99	116	217	311	200

Laboratory Manager Jane Allen

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/29/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	Charlton MA US	FS2-275E-08-08-E-00	

Roll Number	ASTM D5199 Geonet Thickness (mils)	ASTM D7179 Tensile Strength (ppi)	Density ASTM D1505 (g/cc)	Carbon Black Content ASTM D4218 (%)	ASTM D7005 Ply Adhesion Average (ppi) Side A	ASTM D7005 Ply Adhesion Average (ppi) Side B	ASTM D7005 Ply Adhesion Minimum (ppi) Side A	ASTM D7005 Ply Adhesion Minimum (ppi) Side B
131364795	288	83	0.962	2.30	2.52	3.13	2.07	2.59
131364796	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364797	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364798	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364799	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364800	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364801	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364802	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364803	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364804	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364805	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364806	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364807	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364808	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364809	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364810	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364811	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364812	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364813	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364814	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364815	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364816	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364817	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364818	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364820	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364821	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364822	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364823	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364824	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364825	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364826	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364827	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364828	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364829	292	88	0.969	2.31	2.85	2.90	2.36	2.65

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/29/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	Charlton MA US	FS2-275E-08-08-E-00	

Roll Number	ASTM D5199 Geonet Thickness (mils)	ASTM D7179 Tensile Strength (ppi)	Density ASTM D1505 (g/cc)	Carbon Black Content ASTM D4218 (%)	ASTM D7005 Ply Adhesion Average (ppi) Side A	ASTM D7005 Ply Adhesion Average (ppi) Side B	ASTM D7005 Ply Adhesion Minimum (ppi) Side A	ASTM D7005 Ply Adhesion Minimum (ppi) Side B
131364830	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364831	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364832	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364833	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364834	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364835	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364836	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364837	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364838	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364839	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364840	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364841	295	90	0.963	2 30	1.79	2.13	1.46	1.77
131364842	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364843	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364844	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364845	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364846	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364847	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364848	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364849	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364850	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364851	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364852	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364853	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364854	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364855	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364856	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364857	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364858	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364859	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364860	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364861	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364862	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364863	293	95	0.964	2.33	1.63	1.98	1.32	1.62

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/29/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	Charlton MA US	FS2-275E-08-08-E-00	

Roll Number	ASTM D5199 Geonet Thickness (mils)	ASTM D7179 Tensile Strength (ppi)	Density ASTM D1505 (g/cc)	Carbon Black Content ASTM D4218 (%)	ASTM D7005 Ply Adhesion Average (ppi) Side A	ASTM D7005 Ply Adhesion Average (ppi) Side B	ASTM D7005 Ply Adhesion Minimum (ppi) Side A	ASTM D7005 Ply Adhesion Minimum (ppi) Side B
131364864	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364865	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364866	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364867	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364868	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364869	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364870	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364871	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364872	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364873	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364874	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364875	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364876	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364877	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364878	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364879	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364880	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364881	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364882	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364883	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364884	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364885	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364886	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364887	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364888	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364889	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364890	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364891	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364892	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364893	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364894	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364895	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364896	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364897	290	90	0.964	2.30	2.54	2.18	2.21	1.78

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/29/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	Charlton MA US	FS2-275E-08-08-E-00	

Roll Number	ASTM D5199 Geonet Thickness (mils)	ASTM D7179 Tensile Strength (ppi)	Density ASTM D1505 (g/cc)	Carbon Black Content ASTM D4218 (%)	ASTM D7005 Ply Adhesion Average (ppi) Side A	ASTM D7005 Ply Adhesion Average (ppi) Side B	ASTM D7005 Ply Adhesion Minimum (ppi) Side A	ASTM D7005 Ply Adhesion Minimum (ppi) Side B
131364898	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364899	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364900	290	90	0.964	2.30	2.54	2.18	2.21	1.78
131364901	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364902	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364903	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364904	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364905	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364906	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364907	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364908	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364909	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364910	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364911	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364912	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364913	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364914	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364915	289	88	0.964	2.29	2.02	1.80	1.56	1.56
131364916	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364917	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364918	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364919	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364920	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364921	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364922	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364923	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364924	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364925	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364926	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364927	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364928	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364929	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364930	284	81	0.962	2.18	1.94	1.96	1.57	1.75
131364931	287	82	0.965	2.23	1.32	1.09	1.04	0.83

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/29/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	Charlton MA US	FS2-275E-08-08-E-00	

Roll Number	ASTM D5199 Geonet Thickness (mils)	ASTM D7179 Tensile Strength (ppi)	Density ASTM D1505 (g/cc)	Carbon Black Content ASTM D4218 (%)	ASTM D7005 Ply Adhesion Average (ppi) Side A	ASTM D7005 Ply Adhesion Average (ppi) Side B	ASTM D7005 Ply Adhesion Minimum (ppi) Side A	ASTM D7005 Ply Adhesion Minimum (ppi) Side B
131364932	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364933	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364934	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364935	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364936	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364937	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364938	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364939	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364940	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364941	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364942	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364943	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364944	287	82	0.965	2.23	1.32	1.09	1.04	0.83
131364945	287	82	0.965	2.23	1.32	1.09	1.04	0.83

Laboratory Manager Jane Allen

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/29/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	Charlton MA US	FS2-275E-08-08-E-00	

Roll Number	ASTM D5199 Geonet Thickness (mils)	ASTM D7179 Tensile Strength (ppi)	Density ASTM D1505 (g/cc)	Carbon Black Content ASTM D4218 (%)	ASTM D7005 Ply Adhesion Average (ppi) Side A	ASTM D7005 Ply Adhesion Average (ppi) Side B	ASTM D7005 Ply Adhesion Minimum (ppi) Side A	ASTM D7005 Ply Adhesion Minimum (ppi) Side B
131364795	288	83	0.962	2.30	2.52	3.13	2.07	2.59
131364796	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364797	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364798	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364799	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364800	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364801	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364802	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364803	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364804	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364805	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364806	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364807	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364808	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364809	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364810	288	85	0.961	2.30	2.12	2.13	1.77	1.77
131364811	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364812	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364813	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364814	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364815	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364816	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364817	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364818	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364820	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364821	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364822	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364823	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364824	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364825	284	90	0.964	2.30	1.96	2.06	1.62	1.71
131364826	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364827	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364828	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364829	292	88	0.969	2.31	2.85	2.90	2.36	2.65

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/29/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	Charlton MA US	FS2-275E-08-08-E-00	

Roll Number	ASTM D5199 Geonet Thickness (mils)	ASTM D7179 Tensile Strength (ppi)	Density ASTM D1505 (g/cc)	Carbon Black Content ASTM D4218 (%)	ASTM D7005 Ply Adhesion Average (ppi) Side A	ASTM D7005 Ply Adhesion Average (ppi) Side B	ASTM D7005 Ply Adhesion Minimum (ppi) Side A	ASTM D7005 Ply Adhesion Minimum (ppi) Side B
131364830	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364831	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364832	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364833	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364834	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364835	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364836	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364837	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364838	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364839	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364840	292	88	0.969	2.31	2.85	2.90	2.36	2.65
131364841	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364842	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364843	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364844	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364845	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364846	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364847	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364848	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364849	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364850	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364851	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364852	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364853	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364854	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364855	295	90	0.963	2.30	1.79	2.13	1.46	1.77
131364856	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364857	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364858	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364859	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364860	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364861	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364862	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364863	293	95	0.964	2.33	1.63	1.98	1.32	1.62

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/29/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	Charlton MA US	FS2-275E-08-08-E-00	

Roll Number	ASTM D5199 Geonet Thickness (mils)	ASTM D7179 Tensile Strength (ppi)	Density ASTM D1505 (g/cc)	Carbon Black Content ASTM D4218 (%)	ASTM D7005 Ply Adhesion Average (ppi) Side A	ASTM D7005 Ply Adhesion Average (ppi) Side B	ASTM D7005 Ply Adhesion Minimum (ppi) Side A	ASTM D7005 Ply Adhesion Minimum (ppi) Side B
131364864	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364865	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364866	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364867	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364868	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364869	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364870	293	95	0.964	2.33	1.63	1.98	1.32	1.62
131364871	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364872	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364873	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364874	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364875	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364876	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364877	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364878	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364879	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364880	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364881	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364882	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364883	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364884	288	96	0.965	2.45	2.09	1.35	1.79	1.14
131364885	288	96	0.965	2.45	2.09	1.35	1.79	1.14

Laboratory Manager Jane Allen

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/31/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064068	New England Liner Systems	Charlton MA US	HDT-040GE-BBB-B-W0	

Roll Number	Thickness Average ASTM D5994 (mils)	Thickness Minimum ASTM D5994 (mils)	Yield Strength ASTM D6693 (ppi) MD	Yield Strength ASTM D6693 (ppi) TD	Yield Elongation ASTM D6693 (%) MD	Yield Elongation ASTM D6693 (%) TD	Break Strength ASTM D6693 (ppi) MD	Break Strength ASTM D6693 (ppi) TD	Break Elongation ASTM D6693 (%) MD	Break Elongation ASTM D6693 (%) TD	Tear Resistance ASTM D1004 (lbs) MD	Tear Resistance ASTM D1004 (lbs) TD	Puncture Resistance ASTM D4833(lbs)	Density ASTM D1505 (g/cc)	Carbon Black Content ASTM D4218 (%)	Carbon Black Dispersion ASTM D5596 (Views in Cat1-Cat2)	Asperity Height GRI GM12 (mils) Side A	Asperity Height GRI GM12 (mils) Side B
108154944	39	36	105	112	17	17	151	130	569	540	40	38	117	0.943	2.28	10	21	22
108154945	39	37	105	112	17	17	151	130	569	540	40	38	117	0.943	2.28	10	21	21

Laboratory Manager Jane Allen

GSE Lining Technology, Inc.

Transmissivity Report
ASTM D4716

Roll No. 131364795

ROLL IDENTIFICATION

Roll Number	131364795
Product Name	FS2-275E-08-08-E-00
Production Date	3/27/2011
Resin Lot #	CB11022601

CUSTOMER INFORMATION

Order Number	64068
Customer Name	New England Lining Systems
Project Name	Flint Road Landfill
Location	Charlton, MA

Pressure (psf)	Gradient	Net/Composite	Transmissivity Results (m^2/sec)	(gal/min/ft)	Seat Time (min)	Boundary
10000	0.10	Net	6.74E-03	32.58	15	SS Plates
10000	0.10	Composite	2.51E-03	11.59	15	Sand / Liner

GSE Lining Technology, LLC

ROLL TEST DATA REPORT

GSE QC APPROVED

Report Date: 3/30/2011

Sales Order No.	Customer Name	Project Location	Product Name	BOL Number
SO-064087	New England Liner Systems	Plantsville CT US	HDT-040GE-BBB-B-W0	

Roll Number	Thickness Average ASTM D5994 (mils)	Thickness Minimum ASTM D5994 (mils)	Yield Strength ASTM D6693 (ppi) MD	Yield Strength ASTM D6693 (ppi) TD	Yield Elongation ASTM D6693 (%) MD	Yield Elongation ASTM D6693 (%) TD	Break Strength ASTM D6693 (ppi) MD	Break Strength ASTM D6693 (ppi) TD	Break Elongation ASTM D6693 (%) MD	Break Elongation ASTM D6693 (%) TD	Tear Resistance ASTM D1004 (lbs) MD	Tear Resistance ASTM D1004 (lbs) TD	Puncture Resistance ASTM D4833(lbs)	Density ASTM D1505 (g/cc)	Carbon Black Content ASTM D4218 (%)	Carbon Black Dispersion ASTM D5596 (Views in Cat1-Cat2)	Asperity Height GRI GM12 (mils) Side A	Asperity Height GRI GM12 (mils) Side B
108154933	39	36	110	104	16	16	124	150	435	554	38	39	116	0.945	2.37	10	22	22
108154934	40	34	110	104	16	16	124	150	435	554	38	39	116	0.945	2.37	10	22	22

Laboratory Manager Jane Allen

Chevron Phillips Chemical Company LP

CoA Date: 10/25/2010

Certificate of Analysis

Shipped To: GSE LINING TECHNOLOGY LLC
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: Phouangsavanh
Fax:

CPC Delivery #: 88150681
PO #: 03-063552
Weight: 186200 LB
Ship Date: 10/25/2010
Package: BULK
Mode: Hopper Car
Car #: PSPX001256
Seal No: 264553

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8201127

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.1	g/10mi
HLMI Flow Rate	ASTM D1238	12.0	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Production Date		09/29/2010	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. **However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at 800-231-1212

Equistar Chemicals, LP
One Houston Center
1221 McKinney
Houston TX 77010

Certificate Of Analysis

Certificate of Analysis Contact:
GSE LINING TECHNOLOGY INC
SCOTT FRANKLIN
1245 EASTLAND AVENUE
KINGSTREE SC 29556

Ship-To Address:
GSE LINING TECHNOLOGY INC
1245 EASTLAND AVENUE
KINGSTREE SC 29556
USA

Equistar Material	: 504295 PETROTHENE® LR732001	**Customer Order No.**	: 03-064835
Batch Number	: CB11022601	**Customer Number**	: 42584
Vehicle Number	: AMCX6956	**Date Shipped**	: March 01, 2011
Estimated Quantity	: 192,350 LBS	**Equistar Order No.**	: 2095493 000010
		Delivery Item No.	: 82693510 000010

Test Description	Test Result	Unit of Measure
Vehicle ID	AMCX6956	
Vehicle Type	HOPPER CAR	
Density, Extrudate @ 23C	0.9535	g/cc
Melt Index, 2160g @ 190C	0.32	g/10 min.

Data reported was generated in an approved Quality Assurance Lab.

Print Date: March 01, 2011 BNLITTLE
This information is available 24 hours a day at
www.CustomerXPRESS.com
Questions ? Call Customer Service: 888-777-0232

Equistar Chemicals, LP
One Houston Center
1221 McKinney
Houston TX 77010

Certificate Of Analysis

Certificate of Analysis Contact:
GSE LINING TECHNOLOGY INC
SCOTT FRANKLIN
1245 EASTLAND AVENUE
KINGSTREE SC 29556

Ship-To Address:
GSE LINING TECHNOLOGY INC
1245 EASTLAND AVENUE
KINGSTREE SC 29556
USA

Equistar Material	: 504295 PETROTHENE® LR732001	**Customer Order No.**	: 03-064835
Batch Number	: CB21030701	**Customer Number**	: 42584
Vehicle Number	: CITX200112	**Date Shipped**	: March 08, 2011
Estimated Quantity	: 201,100 LBS	**Equistar Order No.**	: 2095494 000010
		Delivery Item No.	: 82709038 000010

Test Description	Test Result	Unit of Measure	
Vehicle ID	CITX200112		
Vehicle Type	HOPPER CAR		
Density, Extrudate @ 23C	0.9533	g/cc	STM 011
Melt Index, 2160g @ 190C	0.32	g/10 min	STM 002

Data reported was generated in an approved Quality Assurance Lab.

Print Date: March 08, 2011 BNLITTLE
This information is available 24 hours a day at
www.CustomerXPRESS.com
Questions ? Call Customer Service: 888-777-0232

GeoTesting EXPRESS

Client:	New England Liner Systems	
Project:	Flint Road Landfill	
Project Location:	Charlton, MA	
GTX Project No.:	10679	Tested By: jdw
Test Date:	04/11/11	Checked By: bfs
Sample ID:	Roll #131364827	
Description:	Black, biplanar geocomposite, GSE	

Hydraulic Transmissivity - ASTM D 4716

Specimen Length, in:	12
Specimen Width, in:	12
Boundary Conditions	(bottom to top): steel plate/sand/geocomposite/geomembrane/steel plate
Direction of Flow:	Machine Direction
Effluent Water Temperature, °C:	22

Normal Compressive Stress, psf	Seating Time, hours	Hydraulic Gradient	Transmissivity, m^2/sec	Unit Flow	
				gal/min/ft	gal/hr/ft
10000 ✓	0.25 ✓	0.1 ✓	1.8E-03 ✓	0.9	54.8
10000	0.25	0.1	1.8E-03	0.9	54.1
10000	0.25	0.1	1.8E-03	0.9	54.5
		Average	1.8E-03	0.9	54.5

Notes: Site specific sand and geomembrane used in test. Materials provided by client.

GeoTesting EXPRESS

Client:	New England Liner Systems	
Project:	Flint Road Landfill	
Project Location:	Charlton, MA	
GTX Project No.:	10679	Tested By: jdw
Test Date:	04/11/11	Checked By: bfs
Sample ID:	Roll #131364796	
Description:	Black, biplanar geocomposite, GSE	

Hydraulic Transmissivity - ASTM D 4716

Specimen Length, in:	12
Specimen Width, in:	12
Boundary Conditions	(bottom to top): steel plate/sand/geocomposite/geomembrane/steel plate
Direction of Flow:	Machine Direction
Effluent Water Temperature, °C:	22

Normal Compressive Stress, psf	Seating Time, hours	Hydraulic Gradient	Transmissivity, m^2/sec	Unit Flow	
				gal/min/ft	gal/hr/ft
10000	0.25	0.1	2.0E-03	1.0	61.0
10000	0.25	0.1	2.0E-03	1.0	60.8
10000	0.25	0.10	2.0E-03	1.0	60.4
		Average	2.0E-03	1.0	60.7

Notes: Site specific sand and geomembrane used in test. Materials provided by client.

GeoTesting EXPRESS

Client:	New England Liner Systems
Project:	Flint Road Landfill
Project Location:	Charlton, MA
GTX Project No.:	10679
Test Date:	04/12/11
Tested By:	bfs
Checked By:	jdt

Density of Plastics by the Density-Gradient Technique by ASTM D 1505

Sample ID	Spec. #	Density, g/cm^3
Roll #131364796	1	0.9237
	2	0.9237
Black, biplanar geocomposite, GSE	3	0.9237
	AVG.	0.9237

0.94

Sample ID	Spec. #	Density, g/cm^3
Roll #131364827	1	0.9236
	2	0.9237
Black, biplanar geocomposite, GSE	3	0.9237
	AVG.	0.9237

Sample ID	Spec. #	Density, g/cm^3
Roll #131364860	1	0.9236
	2	0.9237
Black, biplanar geocomposite, GSE	3	0.9237
	AVG.	0.9236

Sample ID	Spec. #	Density, g/cm^3
Roll #131364893	1	0.9237
	2	0.9237
Black, biplanar geocomposite, GSE	3	0.9237
	AVG.	0.9237

Sample ID	Spec. #	Density, g/cm^3
Roll #131364926	1	0.9236
	2	0.9237
Black, biplanar geocomposite, GSE	3	0.9237
	AVG.	0.9237

Comments:

Temperature: 23°C

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	New England Liner Systems	
Project Name:	Flint Road Landfill	
Project Location:	Charlton, MA	
GTX #:	10679	Tested By: bfs/mgd
Test Date:	04/13/11	Checked By: jdt

Carbon Black in Olefin Plastics by ASTM D 1603

2%

Sample ID	Specimen Number	Carbon Black, %
Roll #131364796	1	2.46
	2	2.42
Black, biplanar geocomposite, GSE	Average	2.44

Sample ID	Specimen Number	Carbon Black, %
Roll #131364827	1	2.28
	2	2.29
Black, biplanar geocomposite, GSE	Average	2.28

Sample ID	Specimen Number	Carbon Black, %
Roll #131364860	1	2.49
	2	2.02
Black, biplanar geocomposite, GSE	Average	2.25

Sample ID	Specimen Number	Carbon Black, %
Roll #131364893	1	2.31
	2	2.33
Black, biplanar geocomposite, GSE	Average	2.32

Sample ID	Specimen Number	Carbon Black, %
Roll #131364926	1	2.35
	2	2.36
Black, biplanar geocomposite, GSE	Average	2.35

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679	Tested By:	jdw
Test Date:	04/13/11	Checked By:	bfs
Sample ID:	Roll #131364860		
Description:	Black, bi-planar geocomposite, GSE Geotextile portion only tested (black non-woven)		

Breaking Force and Elongation of Textile Fabrics (Strip Method)
by ASTM D 5035
constant rate of extension (CRE) tensile testing machine

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	3 in	Grips:	Curtis "Geo" Grip
Maximum Load:	500 lb	Padding:	---
		Condition:	dry

	Machine Direction		Cross Machine Direction	
Specimen Number	Maximum Breaking Strength, lbs	Apparent Breaking Elongation, %	Maximum Breaking Strength, lbs	Apparent Breaking Elongation, %
1	86.5	53	109	74
2	112	67	143	63
3	114	67	143	84
4	96.1	57	119	80
5	136	60	151	70
6	99.1	60	123	80
7	---	---	107	63
8	---	---	170	80
Average	107	61	133	74
Standard Deviation	17.5	5.5	22.2	8.2
Coefficient of Variation, %	16.3	9.1	16.7	11

Comments: 1 inch cut strip test

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679	Tested By:	jdw
Test Date:	04/13/11	Checked By:	bfs
Sample ID:	Roll #131364893		
Description:	Black, bi-planar geocomposite, GSE Geotextile portion only tested (black non-woven)		

Breaking Force and Elongation of Textile Fabrics (Strip Method)
by ASTM D 5035
constant rate of extension (CRE) tensile testing machine

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	3 in	Grips:	Curtis "Geo" Grip
Maximum Load:	500 lb	Padding:	---
		Condition:	dry

	Machine Direction		Cross Machine Direction	
Specimen Number	Maximum Breaking Strength, lbs	Apparent Breaking Elongation, %	Maximum Breaking Strength, lbs	Apparent Breaking Elongation, %
1	82.6	60	102	77
2	87.1	57	98.5	77
3	100	53	111	80
4	88.4	40	125	80
5	74.5	53	128	90
6	81.4	60	132	87
7	---	---	128	70
8	---	---	159	87
Average	85.7	54	123	81
Standard Deviation	8.62	7.5	19.5	6.6
Coefficient of Variation, %	10.1	14	15.9	8.2

Comments: 1 inch cut strip test

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679	Tested By:	jdw
Test Date:	04/13/11	Checked By:	bfs
Sample ID:	Roll #131364926		
Description:	Black, bi-planar geocomposite, GSE Geotextile portion only tested (black non-woven)		

Breaking Force and Elongation of Textile Fabrics (Strip Method)
by ASTM D 5035
constant rate of extension (CRE) tensile testing machine

Testing Machine:	Instron 1000	Testing Speed:	12 in/min
Grip Separation:	3 in	Grips:	Curtis "Geo" Grip
Maximum Load:	500 lb	Padding:	---
		Condition:	dry

	Machine Direction		Cross Machine Direction	
Specimen Number	Maximum Breaking Strength, lbs	Apparent Breaking Elongation, %	Maximum Breaking Strength, lbs	Apparent Breaking Elongation, %
1	83.5	63	142	74
2	85.4	53	153	77
3	78.2	47	157	80
4	86.4	67	144	84
5	102	57	91.3	74
6	100	53	128	80
7	---	---	155	74
8	---	---	149	90
Average	89.2	57	140	79
Standard Deviation	9.47	7.3	21.6	5.7
Coefficient of Variation, %	10.6	13	15.5	7.2

Comments: 1 inch cut strip test

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679	Tested By:	bfs
Test Date:	04/11/11	Checked By:	jdt
Sample ID:	Roll #131364796		
Sample Decription:	Black, biplanar geocomposite, GSE (Net portion only)		

Nominal Thickness of Geotextiles and Geomembranes by ASTM D 5199

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: IDC-112E	Pressure:	63-65 g
Presser Foot:	0.25 in. diameter	Loading Time:	5 seconds

Measurement Number	Thickness, mils
1	290
2	287
3	286
4	284
5	286
6	280
7	282
8	281
9	281
10	282
11	278
12	277
13	277
14	277
15	278
16	282
17	280
18	280
19	282
20	288
Average	282
Standard Deviation	3.60
Coefficient of Variation, %	1.28

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679	Tested By:	bfs
Test Date:	04/11/11	Checked By:	jdt
Sample ID:			
Sample Decription:	Black, biplanar geocomposite, GSE (Net portion only)		

Nominal Thickness of Geotextiles and Geomembranes by ASTM D 5199

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: IDC-112E	Pressure:	63-65 g
Presser Foot:	0.25 in. diameter	Loading Time:	5 seconds

Measurement Number	Thickness, mils
1	286
2	286
3	287
4	289
5	278
6	277
7	278
8	277
9	278
10	275
11	274 OK
12	277
13	278
14	279
15	285
16	285
17	296
18	292
19	288
20	289
Average	283
Standard Deviation	6.08
Coefficient of Variation, %	2.15

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS

Client:	New England Liner Systems		
Project Name:	Flint Road Landfill		
Project Location:	Charlton, MA		
GTX #:	10679	Tested By:	bfs
Test Date:	04/11/11	Checked By:	jdt
Sample ID:			
Sample Decription:	Black, biplanar geocomposite, GSE (Net portion only)		

Nominal Thickness of Geotextiles and Geomembranes by ASTM D 5199

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: IDC-112E	Pressure:	63-65 g
Presser Foot:	0.25 in. diameter	Loading Time:	5 seconds

Measurement Number	Thickness, mils
1	289
2	288
3	287
4	289
5	280
6	279
7	281
8	280
9	279
10	279
11	285
12	280
13	288
14	286
15	292
16	291
17	283
18	283
19	288
20	287
Average	285
Standard Deviation	4.14
Coefficient of Variation, %	1.45

Comments:

Appendix F

Barrier Protection Layer: Source and Conformance Testing

Barrier Protection Material
Environmental Testing

CDM Smith

ANALYTICAL REPORT

Lab Number:	L0818553
Client:	Camp Dresser & McKee, Inc. 1 Cambridge Place 50 Hampshire Street Cambridge, MA 02139
ATTN:	Vin Recchia
Project Name:	CHARLTON LANDFILL
Project Number:	75398-67217
Report Date:	11/16/09

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (2003), NJ (MA935), RI (LAO00065), ME (MA0086), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 11/16/09

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L0818553-01	SS-1	CHARLTON, MA	12/15/08 11:00
L0818553-02	SS-2	CHARLTON, MA	12/15/08 11:02
L0818553-03	SS-3	CHARLTON, MA	12/15/08 11:04
L0818553-04	SS-4	CHARLTON, MA	12/15/08 11:06
L0818553-05	SS-5	CHARLTON, MA	12/15/08 11:08
L0818553-06	SS-6	CHARLTON, MA	12/15/08 11:10
L0818553-07	SS-7	CHARLTON, MA	12/15/08 11:12
L0818553-08	SS-8	CHARLTON, MA	12/15/08 11:14
L0818553-09	SS-9	CHARLTON, MA	12/15/08 11:16
L0818553-10	SS-10	CHARLTON, MA	12/15/08 11:18

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A, B, C & D is required for "Presumptive Certainty" status		
A	Were all samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation for the data set?	YES
B	Were all QA/QC procedures required for the specified analytical methods(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	YES
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in section 2.0 of the MADEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	YES
D	VPH and EPH methods only: Was the VPH or EPH method run without significant modifications, as specified in Section 11.3?	YES

A response to questions E and F is required for "Presumptive Certainty" status		
E	Were all QC performance standards and recommendations for the specified method(s) achieved?	NO
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

For additional information, please contact Client Services at 800-624-9220.

Report Submission

This report replaces the report issued December 24, 2008. The reported detection limits have been lowered for Napthalene, 2-Methylnapthalene, Acenapthylene and Dibenzo(a,h)anthracene on samples L0818553-03, -04, -05, and -08.

MCP Related Narratives

EPH

L0818553-03 through -05, -08 and -09 have elevated detection limits due to the dilutions required by matrix interferences encountered during the concentration of the samples.

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

Case Narrative (continued)

In reference to question E:

The WG347747-2/-3 LCS/LCSD RPDs associated with L0818553-02 through -10 are above the acceptance criteria for Nonane (C9)(36%) and Decane (C10)(27%); however, the individual LCS/LCSD recoveries are within method limits. The results of the associated samples are reported.

The WG348030-2 LCS recovery associated with L0818553-01 was outside the acceptance criteria for Decane (C10)(36%); however, the target carbon ranges and analytes were within method criteria. The results of the original analysis are reported. In addition, the associated WG348030-2/-3 LCS/LCSD RPD is above the acceptance criteria for Decane (C10)(31%).

The WG348030-2/-3 LCS/LCSD RPDs associated with L0818553-01 are above the acceptance criteria for Naphthalene (27%), 2-Methylnaphthalene (28%), Nonane (C9)(32%), and Dodecane (C12)(28%); however, the individual LCS/LCSD recoveries are within method limits. The results of the associated samples are reported.

Metals

In reference to question E:

The WG347690-1 Method Blank, associated with L0818553-02 through -10, has a concentration above the reporting limit for Chromium. Since the associated sample concentrations are 10x the blank concentration for this analyte, no corrective action is required. The results of the original analyses are reported.

In reference to question F:

All samples were analyzed for a subset of MCP elements per the Chain of Custody.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Elizabeth A. Simmons

Title: Technical Director/Representative Date: 11/16/09

ORGANICS

PETROLEUM HYDROCARBONS

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-01	Date Collected:	12/15/08 11:00
Client ID:	SS-1	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/22/08 15:25
Analytical Date:	12/24/08 08:27	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/23/08
Percent Solids:	79%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab					
C9-C18 Aliphatics	ND		mg/kg	8.44	1
C19-C36 Aliphatics	15.7		mg/kg	8.44	1
C11-C22 Aromatics	25.4		mg/kg	8.44	1
C11-C22 Aromatics, Adjusted	22.6		mg/kg	8.44	1
Naphthalene	ND		mg/kg	0.422	1
2-Methylnaphthalene	ND		mg/kg	0.422	1
Acenaphthylene	ND		mg/kg	0.422	1
Acenaphthene	ND		mg/kg	0.422	1
Fluorene	ND		mg/kg	0.422	1
Phenanthrene	0.638		mg/kg	0.422	1
Anthracene	ND		mg/kg	0.422	1
Fluoranthene	0.858		mg/kg	0.422	1
Pyrene	0.756		mg/kg	0.422	1
Benzo(a)anthracene	ND		mg/kg	0.422	1
Chrysene	0.462		mg/kg	0.422	1
Benzo(b)fluoranthene	ND		mg/kg	0.422	1
Benzo(k)fluoranthene	ND		mg/kg	0.422	1
Benzo(a)pyrene	ND		mg/kg	0.422	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.422	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.422	1
Benzo(ghi)perylene	ND		mg/kg	0.422	1

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-01	Date Collected:	12/15/08 11:00
Client ID:	SS-1	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	45		40-140
o-Terphenyl	59		40-140
2-Fluorobiphenyl	73		40-140
2-Bromonaphthalene	77		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-02	Date Collected:	12/15/08 11:02
Client ID:	SS-2	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 14:33	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	78%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab					
C9-C18 Aliphatics	ND		mg/kg	8.55	1
C19-C36 Aliphatics	33.6		mg/kg	8.55	1
C11-C22 Aromatics	51.1		mg/kg	8.55	1
C11-C22 Aromatics, Adjusted	44.7		mg/kg	8.55	1
Naphthalene	ND		mg/kg	0.427	1
2-Methylnaphthalene	ND		mg/kg	0.427	1
Acenaphthylene	ND		mg/kg	0.427	1
Acenaphthene	ND		mg/kg	0.427	1
Fluorene	ND		mg/kg	0.427	1
Phenanthrene	0.668		mg/kg	0.427	1
Anthracene	ND		mg/kg	0.427	1
Fluoranthene	1.21		mg/kg	0.427	1
Pyrene	1.15		mg/kg	0.427	1
Benzo(a)anthracene	0.529		mg/kg	0.427	1
Chrysene	0.646		mg/kg	0.427	1
Benzo(b)fluoranthene	0.540		mg/kg	0.427	1
Benzo(k)fluoranthene	0.652		mg/kg	0.427	1
Benzo(a)pyrene	0.604		mg/kg	0.427	1
Indeno(1,2,3-cd)Pyrene	0.435		mg/kg	0.427	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.427	1
Benzo(ghi)perylene	ND		mg/kg	0.427	1

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-02	Date Collected:	12/15/08 11:02
Client ID:	SS-2	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	57		40-140
o-Terphenyl	68		40-140
2-Fluorobiphenyl	74		40-140
2-Bromonaphthalene	78		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-03	Date Collected:	12/15/08 11:04
Client ID:	SS-3	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 15:36	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	84%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab					
C9-C18 Aliphatics	ND		mg/kg	15.9	2
C19-C36 Aliphatics	66.6		mg/kg	15.9	2
C11-C22 Aromatics	111		mg/kg	15.9	2
C11-C22 Aromatics, Adjusted	91.8		mg/kg	15.9	2
Naphthalene	ND		mg/kg	0.660	2
2-Methylnaphthalene	ND		mg/kg	0.660	2
Acenaphthylene	ND		mg/kg	0.660	2
Acenaphthene	ND		mg/kg	0.794	2
Fluorene	ND		mg/kg	0.794	2
Phenanthrene	2.79		mg/kg	0.794	2
Anthracene	ND		mg/kg	0.794	2
Fluoranthene	3.67		mg/kg	0.794	2
Pyrene	3.16		mg/kg	0.794	2
Benzo(a)anthracene	1.51		mg/kg	0.794	2
Chrysene	1.82		mg/kg	0.794	2
Benzo(b)fluoranthene	1.33		mg/kg	0.794	2
Benzo(k)fluoranthene	1.41		mg/kg	0.794	2
Benzo(a)pyrene	1.52		mg/kg	0.794	2
Indeno(1,2,3-cd)Pyrene	0.991		mg/kg	0.794	2
Dibenzo(a,h)anthracene	ND		mg/kg	0.660	2
Benzo(ghi)perylene	0.808		mg/kg	0.794	2

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-03	Date Collected:	12/15/08 11:04
Client ID:	SS-3	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	59		40-140
o-Terphenyl	86		40-140
2-Fluorobiphenyl	74		40-140
2-Bromonaphthalene	77		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-04	Date Collected:	12/15/08 11:06
Client ID:	SS-4	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 15:05	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	84%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab					
C9-C18 Aliphatics	ND		mg/kg	15.9	2
C19-C36 Aliphatics	70.6		mg/kg	15.9	2
C11-C22 Aromatics	107		mg/kg	15.9	2
C11-C22 Aromatics, Adjusted	91.2		mg/kg	15.9	2
Naphthalene	ND		mg/kg	0.660	2
2-Methylnaphthalene	ND		mg/kg	0.660	2
Acenaphthylene	ND		mg/kg	0.660	2
Acenaphthene	ND		mg/kg	0.794	2
Fluorene	ND		mg/kg	0.794	2
Phenanthrene	2.49		mg/kg	0.794	2
Anthracene	ND		mg/kg	0.794	2
Fluoranthene	2.79		mg/kg	0.794	2
Pyrene	2.99		mg/kg	0.794	2
Benzo(a)anthracene	1.34		mg/kg	0.794	2
Chrysene	1.56		mg/kg	0.794	2
Benzo(b)fluoranthene	1.10		mg/kg	0.794	2
Benzo(k)fluoranthene	1.16		mg/kg	0.794	2
Benzo(a)pyrene	1.31		mg/kg	0.794	2
Indeno(1,2,3-cd)Pyrene	0.822		mg/kg	0.794	2
Dibenzo(a,h)anthracene	ND		mg/kg	0.660	2
Benzo(ghi)perylene	ND		mg/kg	0.794	2

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-04	Date Collected:	12/15/08 11:06
Client ID:	SS-4	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	68		40-140
o-Terphenyl	86		40-140
2-Fluorobiphenyl	73		40-140
2-Bromonaphthalene	77		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-05	Date Collected:	12/15/08 11:08
Client ID:	SS-5	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 07:00	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	80%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab					
C9-C18 Aliphatics	ND		mg/kg	16.7	2
C19-C36 Aliphatics	94.7		mg/kg	16.7	2
C11-C22 Aromatics	105		mg/kg	16.7	2
C11-C22 Aromatics, Adjusted	104		mg/kg	16.7	2
Naphthalene	ND		mg/kg	0.660	2
2-Methylnaphthalene	ND		mg/kg	0.660	2
Acenaphthylene	ND		mg/kg	0.660	2
Acenaphthene	ND		mg/kg	0.833	2
Fluorene	ND		mg/kg	0.833	2
Phenanthrene	ND		mg/kg	0.833	2
Anthracene	ND		mg/kg	0.833	2
Fluoranthene	0.857		mg/kg	0.833	2
Pyrene	ND		mg/kg	0.833	2
Benzo(a)anthracene	ND		mg/kg	0.833	2
Chrysene	ND		mg/kg	0.833	2
Benzo(b)fluoranthene	ND		mg/kg	0.833	2
Benzo(k)fluoranthene	ND		mg/kg	0.833	2
Benzo(a)pyrene	ND		mg/kg	0.833	2
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.833	2
Dibenzo(a,h)anthracene	ND		mg/kg	0.660	2
Benzo(ghi)perylene	ND		mg/kg	0.833	2

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-05	Date Collected:	12/15/08 11:08
Client ID:	SS-5	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	55		40-140
o-Terphenyl	77		40-140
2-Fluorobiphenyl	68		40-140
2-Bromonaphthalene	77		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-06	Date Collected:	12/15/08 11:10
Client ID:	SS-6	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 12:12	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	83%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab					
C9-C18 Aliphatics	8.95		mg/kg	8.03	1
C19-C36 Aliphatics	62.9		mg/kg	8.03	1
C11-C22 Aromatics	93.5		mg/kg	8.03	1
C11-C22 Aromatics, Adjusted	79.2		mg/kg	8.03	1
Naphthalene	ND		mg/kg	0.402	1
2-Methylnaphthalene	ND		mg/kg	0.402	1
Acenaphthylene	ND		mg/kg	0.402	1
Acenaphthene	ND		mg/kg	0.402	1
Fluorene	ND		mg/kg	0.402	1
Phenanthrene	1.71		mg/kg	0.402	1
Anthracene	ND		mg/kg	0.402	1
Fluoranthene	2.22		mg/kg	0.402	1
Pyrene	2.35		mg/kg	0.402	1
Benzo(a)anthracene	1.21		mg/kg	0.402	1
Chrysene	1.44		mg/kg	0.402	1
Benzo(b)fluoranthene	1.12		mg/kg	0.402	1
Benzo(k)fluoranthene	1.13		mg/kg	0.402	1
Benzo(a)pyrene	1.40		mg/kg	0.402	1
Indeno(1,2,3-cd)Pyrene	0.902		mg/kg	0.402	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.402	1
Benzo(ghi)perylene	0.769		mg/kg	0.402	1

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-06	Date Collected:	12/15/08 11:10
Client ID:	SS-6	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	72		40-140
o-Terphenyl	88		40-140
2-Fluorobiphenyl	93		40-140
2-Bromonaphthalene	98		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-07	Date Collected:	12/15/08 11:12
Client ID:	SS-7	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 11:12	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	84%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab					
C9-C18 Aliphatics	ND		mg/kg	7.94	1
C19-C36 Aliphatics	49.8		mg/kg	7.94	1
C11-C22 Aromatics	59.7		mg/kg	7.94	1
C11-C22 Aromatics, Adjusted	49.9		mg/kg	7.94	1
Naphthalene	ND		mg/kg	0.397	1
2-Methylnaphthalene	ND		mg/kg	0.397	1
Acenaphthylene	ND		mg/kg	0.397	1
Acenaphthene	ND		mg/kg	0.397	1
Fluorene	ND		mg/kg	0.397	1
Phenanthrene	1.06		mg/kg	0.397	1
Anthracene	ND		mg/kg	0.397	1
Fluoranthene	1.66		mg/kg	0.397	1
Pyrene	1.71		mg/kg	0.397	1
Benzo(a)anthracene	0.850		mg/kg	0.397	1
Chrysene	0.948		mg/kg	0.397	1
Benzo(b)fluoranthene	0.763		mg/kg	0.397	1
Benzo(k)fluoranthene	0.760		mg/kg	0.397	1
Benzo(a)pyrene	0.923		mg/kg	0.397	1
Indeno(1,2,3-cd)Pyrene	0.615		mg/kg	0.397	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.397	1
Benzo(ghi)perylene	0.537		mg/kg	0.397	1

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-07	Date Collected:	12/15/08 11:12
Client ID:	SS-7	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	63		40-140
o-Terphenyl	67		40-140
2-Fluorobiphenyl	67		40-140
2-Bromonaphthalene	71		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-08	Date Collected:	12/15/08 11:14
Client ID:	SS-8	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 11:42	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab					
C9-C18 Aliphatics	ND		mg/kg	15.7	2
C19-C36 Aliphatics	122		mg/kg	15.7	2
C11-C22 Aromatics	158		mg/kg	15.7	2
C11-C22 Aromatics, Adjusted	143		mg/kg	15.7	2
Naphthalene	ND		mg/kg	0.660	2
2-Methylnaphthalene	ND		mg/kg	0.660	2
Acenaphthylene	ND		mg/kg	0.660	2
Acenaphthene	ND		mg/kg	0.784	2
Fluorene	ND		mg/kg	0.784	2
Phenanthrene	2.43		mg/kg	0.784	2
Anthracene	ND		mg/kg	0.784	2
Fluoranthene	2.85		mg/kg	0.784	2
Pyrene	2.80		mg/kg	0.784	2
Benzo(a)anthracene	1.24		mg/kg	0.784	2
Chrysene	1.50		mg/kg	0.784	2
Benzo(b)fluoranthene	1.17		mg/kg	0.784	2
Benzo(k)fluoranthene	1.08		mg/kg	0.784	2
Benzo(a)pyrene	1.31		mg/kg	0.784	2
Indeno(1,2,3-cd)Pyrene	0.868		mg/kg	0.784	2
Dibenzo(a,h)anthracene	ND		mg/kg	0.660	2
Benzo(ghi)perylene	ND		mg/kg	0.784	2

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-08	Date Collected:	12/15/08 11:14
Client ID:	SS-8	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	66		40-140
o-Terphenyl	82		40-140
2-Fluorobiphenyl	74		40-140
2-Bromonaphthalene	81		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-09	Date Collected:	12/15/08 11:16
Client ID:	SS-9	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 10:12	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	83%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab					
C9-C18 Aliphatics	ND		mg/kg	32.1	4
C19-C36 Aliphatics	35.1		mg/kg	32.1	4
C11-C22 Aromatics	57.5		mg/kg	32.1	4
C11-C22 Aromatics, Adjusted	57.5		mg/kg	32.1	4
Naphthalene	ND		mg/kg	1.61	4
2-Methylnaphthalene	ND		mg/kg	1.61	4
Acenaphthylene	ND		mg/kg	1.61	4
Acenaphthene	ND		mg/kg	1.61	4
Fluorene	ND		mg/kg	1.61	4
Phenanthrene	ND		mg/kg	1.61	4
Anthracene	ND		mg/kg	1.61	4
Fluoranthene	ND		mg/kg	1.61	4
Pyrene	ND		mg/kg	1.61	4
Benzo(a)anthracene	ND		mg/kg	1.61	4
Chrysene	ND		mg/kg	1.61	4
Benzo(b)fluoranthene	ND		mg/kg	1.61	4
Benzo(k)fluoranthene	ND		mg/kg	1.61	4
Benzo(a)pyrene	ND		mg/kg	1.61	4
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	1.61	4
Dibenzo(a,h)anthracene	ND		mg/kg	1.61	4
Benzo(ghi)perylene	ND		mg/kg	1.61	4

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-09	Date Collected:	12/15/08 11:16
Client ID:	SS-9	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	74		40-140
o-Terphenyl	82		40-140
2-Fluorobiphenyl	82		40-140
2-Bromonaphthalene	84		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-10	Date Collected:	12/15/08 11:18
Client ID:	SS-10	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	61,EPH-04-1	Extraction Date:	12/19/08 02:41
Analytical Date:	12/23/08 10:42	Cleanup Method1:	EPH-04-1
Analyst:	AS	Cleanup Date1:	12/22/08
Percent Solids:	82%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab					
C9-C18 Aliphatics	ND		mg/kg	8.13	1
C19-C36 Aliphatics	27.6		mg/kg	8.13	1
C11-C22 Aromatics	30.8		mg/kg	8.13	1
C11-C22 Aromatics, Adjusted	29.6		mg/kg	8.13	1
Naphthalene	ND		mg/kg	0.406	1
2-Methylnaphthalene	ND		mg/kg	0.406	1
Acenaphthylene	ND		mg/kg	0.406	1
Acenaphthene	ND		mg/kg	0.406	1
Fluorene	ND		mg/kg	0.406	1
Phenanthrene	ND		mg/kg	0.406	1
Anthracene	ND		mg/kg	0.406	1
Fluoranthene	0.610		mg/kg	0.406	1
Pyrene	0.589		mg/kg	0.406	1
Benzo(a)anthracene	ND		mg/kg	0.406	1
Chrysene	ND		mg/kg	0.406	1
Benzo(b)fluoranthene	ND		mg/kg	0.406	1
Benzo(k)fluoranthene	ND		mg/kg	0.406	1
Benzo(a)pyrene	ND		mg/kg	0.406	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.406	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.406	1
Benzo(ghi)perylene	ND		mg/kg	0.406	1

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID:	L0818553-10	Date Collected:	12/15/08 11:18
Client ID:	SS-10	Date Received:	12/17/08
Sample Location:	CHARLTON, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	68		40-140
o-Terphenyl	61		40-140
2-Fluorobiphenyl	73		40-140
2-Bromonaphthalene	76		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

Method Blank Analysis
Batch Quality Control

Analytical Method: 61,EPH-04-1
Analytical Date: 12/23/08 01:30
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 12/19/08 02:41
Cleanup Method1: EPH-04-1
Cleanup Date1: 12/22/08

Parameter	Result	Qualifier	Units	RDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 02-10 Batch: WG347747-1				
C9-C18 Aliphatics	ND		mg/kg	6.67
C19-C36 Aliphatics	ND		mg/kg	6.67
C11-C22 Aromatics	ND		mg/kg	6.67
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.67
Naphthalene	ND		mg/kg	0.333
2-Methylnaphthalene	ND		mg/kg	0.333
Acenaphthylene	ND		mg/kg	0.333
Acenaphthene	ND		mg/kg	0.333
Fluorene	ND		mg/kg	0.333
Phenanthrene	ND		mg/kg	0.333
Anthracene	ND		mg/kg	0.333
Fluoranthene	ND		mg/kg	0.333
Pyrene	ND		mg/kg	0.333
Benzo(a)anthracene	ND		mg/kg	0.333
Chrysene	ND		mg/kg	0.333
Benzo(b)fluoranthene	ND		mg/kg	0.333
Benzo(k)fluoranthene	ND		mg/kg	0.333
Benzo(a)pyrene	ND		mg/kg	0.333
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.333
Dibenzo(a,h)anthracene	ND		mg/kg	0.333
Benzo(ghi)perylene	ND		mg/kg	0.333

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	71		40-140
o-Terphenyl	59		40-140
2-Fluorobiphenyl	69		40-140
2-Bromonaphthalene	71		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

Method Blank Analysis
Batch Quality Control

Analytical Method: 61,EPH-04-1
Analytical Date: 12/24/08 03:59
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 12/22/08 15:25
Cleanup Method1: EPH-04-1
Cleanup Date1: 12/23/08

Parameter	Result	Qualifier	Units	RDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01 Batch: WG348030-1				
C9-C18 Aliphatics	ND		mg/kg	6.67
C19-C36 Aliphatics	ND		mg/kg	6.67
C11-C22 Aromatics	ND		mg/kg	6.67
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.67
Naphthalene	ND		mg/kg	0.333
2-Methylnaphthalene	ND		mg/kg	0.333
Acenaphthylene	ND		mg/kg	0.333
Acenaphthene	ND		mg/kg	0.333
Fluorene	ND		mg/kg	0.333
Phenanthrene	ND		mg/kg	0.333
Anthracene	ND		mg/kg	0.333
Fluoranthene	ND		mg/kg	0.333
Pyrene	ND		mg/kg	0.333
Benzo(a)anthracene	ND		mg/kg	0.333
Chrysene	ND		mg/kg	0.333
Benzo(b)fluoranthene	ND		mg/kg	0.333
Benzo(k)fluoranthene	ND		mg/kg	0.333
Benzo(a)pyrene	ND		mg/kg	0.333
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.333
Dibenzo(a,h)anthracene	ND		mg/kg	0.333
Benzo(ghi)perylene	ND		mg/kg	0.333

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	44		40-140
o-Terphenyl	52		40-140
2-Fluorobiphenyl	70		40-140
2-Bromonaphthalene	69		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 11/16/09

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 02-10 Batch: WG347747-2 WG347747-3								
C9-C18 Aliphatics	70		60		40-140	15		25
C19-C36 Aliphatics	69		69		40-140	0		25
C11-C22 Aromatics	70		81		40-140	15		25
Naphthalene	67		62		40-140	8		25
2-Methylnaphthalene	68		68		40-140	0		25
Acenaphthylene	65		68		40-140	5		25
Acenaphthene	68		72		40-140	6		25
Fluorene	64		73		40-140	13		25
Phenanthrene	67		77		40-140	14		25
Anthracene	73		83		40-140	13		25
Fluoranthene	67		80		40-140	18		25
Pyrene	72		83		40-140	14		25
Benzo(a)anthracene	66		81		40-140	20		25
Chrysene	67		83		40-140	21		25
Benzo(b)fluoranthene	67		84		40-140	23		25
Benzo(k)fluoranthene	68		84		40-140	21		25
Benzo(a)pyrene	67		82		40-140	20		25
Indeno(1,2,3-cd)Pyrene	66		82		40-140	22		25
Dibenzo(a,h)anthracene	66		82		40-140	22		25
Benzo(ghi)perylene	67		82		40-140	20		25
Nonane (C9)	59		41		30-140	**36**		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 11/16/09

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 02-10 Batch: WG347747-2 WG347747-3								
Decane (C10)	68		52		40-140	**27**		25
Dodecane (C12)	73		62		40-140	16		25
Tetradecane (C14)	73		66		40-140	10		25
Hexadecane (C16)	73		68		40-140	7		25
Octadecane (C18)	72		69		40-140	4		25
Nonadecane (C19)	72		70		40-140	3		25
Eicosane (C20)	71		70		40-140	1		25
Docosane (C22)	71		71		40-140	0		25
Tetracosane (C24)	70		70		40-140	0		25
Hexacosane (C26)	73		73		40-140	0		25
Octacosane (C28)	71		71		40-140	0		25
Triacontane (C30)	72		73		40-140	1		25
Hexatriacontane (C36)	78		78		40-140	0		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	64		62		40-140
o-Terphenyl	72		89		40-140
2-Fluorobiphenyl	68		76		40-140
2-Bromonaphthalene	74		79		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 11/16/09

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01 Batch: WG348030-2 WG348030-3								
C9-C18 Aliphatics	44		52		40-140	17		25
C19-C36 Aliphatics	59		63		40-140	7		25
C11-C22 Aromatics	62		74		40-140	18		25
Naphthalene	44		58		40-140	**27**		25
2-Methylnaphthalene	46		61		40-140	**28**		25
Acenaphthylene	46		58		40-140	23		25
Acenaphthene	50		62		40-140	21		25
Fluorene	54		64		40-140	17		25
Phenanthrene	60		69		40-140	14		25
Anthracene	67		77		40-140	14		25
Fluoranthene	63		73		40-140	15		25
Pyrene	67		76		40-140	13		25
Benzo(a)anthracene	64		74		40-140	14		25
Chrysene	67		76		40-140	13		25
Benzo(b)fluoranthene	66		75		40-140	13		25
Benzo(k)fluoranthene	68		78		40-140	14		25
Benzo(a)pyrene	65		73		40-140	12		25
Indeno(1,2,3-cd)Pyrene	65		74		40-140	13		25
Dibenzo(a,h)anthracene	65		74		40-140	13		25
Benzo(ghi)perylene	68		77		40-140	12		25
Nonane (C9)	32		44		30-140	**32**		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 11/16/09

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01 Batch: WG348030-2 WG348030-3								
Decane (C10)	**36**		49		40-140	**31**		25
Dodecane (C12)	40		53		40-140	**28**		25
Tetradecane (C14)	45		55		40-140	20		25
Hexadecane (C16)	53		59		40-140	11		25
Octadecane (C18)	57		61		40-140	7		25
Nonadecane (C19)	59		62		40-140	5		25
Eicosane (C20)	58		62		40-140	7		25
Docosane (C22)	59		63		40-140	7		25
Tetracosane (C24)	60		64		40-140	6		25
Hexacosane (C26)	62		67		40-140	8		25
Octacosane (C28)	61		65		40-140	6		25
Triacontane (C30)	64		67		40-140	5		25
Hexatriacontane (C36)	72		74		40-140	3		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	52		47		40-140
o-Terphenyl	67		80		40-140
2-Fluorobiphenyl	62		70		40-140
2-Bromonaphthalene	69		72		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

Fractionation Check Standard Quality Control

Fractionation check standard for 200818205

Parameter	% Recovery	QC Criteria
C9-C18 Aliphatics	77	40-140
C19-C36 Aliphatics	76	40-140
C11-C22 Aromatics	86	40-140
Naphthalene	82	40-140
2-Methylnaphthalene	78	40-140
Acenaphthylene	76	40-140
Acenaphthene	80	40-140
Fluorene	79	40-140
Phenanthrene	78	40-140
Anthracene	82	40-140
Fluoranthene	84	40-140
Pyrene	84	40-140
Benzo(a)anthracene	82	40-140
Chrysene	88	40-140
Benzo(b)fluoranthene	81	40-140
Benzo(k)fluoranthene	97	40-140
Benzo(a)pyrene	78	40-140
Indeno(1,2,3-cd)Pyrene	76	40-140
Dibenzo(a,h)anthracene	83	40-140
Benzo(g,h,i)perylene	82	40-140
Nonane	72	30-140
Decane	77	40-140
Dodecane	80	40-140
Tetradecane	76	40-140
Hexadecane	78	40-140
Octadecane	76	40-140
Nonadecane	75	40-140
Eicosane	77	40-140
Docosane	79	40-140
Tetracosane	83	40-140
Hexacosane	78	40-140
Octacosane	77	40-140
Triacontane	76	40-140
Hexatriacontane	75	40-140
% Naphthalene Breakthrough	0	0-5
% 2-Methylnaphthalene Breakthrough	0	0-5

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

Fractionation Check Standard
Quality Control

Fractionation check standard for 200818205

Surrogate	% Recovery	QC Criteria
Chloro-Octadecane	66	40-140
o-Terphenyl	83	40-140
2-Fluorobiphenyl	75	40-140
2-Bromonaphthalene	76	40-140

METALS

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-01 Date Collected: 12/15/08 11:00

Client ID: SS-1 Date Received: 12/17/08

Sample Location: CHARLTON, MA Field Prep: Not Specified

Matrix: Soil

Percent Solids: 79%

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab										
Arsenic, Total	7.4		mg/kg	0.58	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
Barium, Total	72		mg/kg	0.58	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
Cadmium, Total	ND		mg/kg	0.58	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
Chromium, Total	19		mg/kg	0.58	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
Lead, Total	170		mg/kg	2.9	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
Mercury, Total	0.19		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:16	EPA 7471A	64,7471A	DM
Selenium, Total	ND		mg/kg	2.9	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG
Silver, Total	ND		mg/kg	0.58	1	12/19/08 14:30	12/23/08 10:40	EPA 3050B	60,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L0818553
Project Number: 75398-67217
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-02
Client ID: SS-2
Sample Location: CHARLTON, MA
Matrix: Soil
Percent Solids: 78%

Date Collected: 12/15/08 11:02
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab										
Arsenic, Total	5.4		mg/kg	0.62	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
Barium, Total	74		mg/kg	0.62	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
Cadmium, Total	ND		mg/kg	0.62	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
Chromium, Total	20		mg/kg	0.62	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
Lead, Total	160		mg/kg	3.1	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
Mercury, Total	0.20		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:18	EPA 7471A	64,7471A	DM
Selenium, Total	ND		mg/kg	3.1	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD
Silver, Total	ND		mg/kg	0.62	1	12/18/08 12:00	12/20/08 23:32	EPA 3050B	60,6010B	TD

Project Name: CHARLTON LANDFILL
Lab Number: L0818553
Project Number: 75398-67217
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-03
Client ID: SS-3
Sample Location: CHARLTON, MA
Matrix: Soil
Percent Solids: 84%

Date Collected: 12/15/08 11:04
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab										
Arsenic, Total	5.5		mg/kg	0.55	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
Barium, Total	46		mg/kg	0.55	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
Cadmium, Total	ND		mg/kg	0.55	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
Chromium, Total	15		mg/kg	0.55	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
Lead, Total	92		mg/kg	2.7	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
Mercury, Total	0.65		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:19	EPA 7471A	64,7471A	DM
Selenium, Total	ND		mg/kg	2.7	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD
Silver, Total	ND		mg/kg	0.55	1	12/18/08 12:00	12/20/08 23:38	EPA 3050B	60,6010B	TD

Project Name: CHARLTON LANDFILL
Lab Number: L0818553
Project Number: 75398-67217
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-04
Client ID: SS-4
Sample Location: CHARLTON, MA
Matrix: Soil
Percent Solids: 84%

Date Collected: 12/15/08 11:06
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab										
Arsenic, Total	5.7		mg/kg	0.59	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
Barium, Total	53		mg/kg	0.59	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
Cadmium, Total	ND		mg/kg	0.59	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
Chromium, Total	16		mg/kg	0.59	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
Lead, Total	110		mg/kg	2.9	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
Mercury, Total	0.54		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:21	EPA 7471A	64,7471A	DM
Selenium, Total	ND		mg/kg	2.9	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD
Silver, Total	ND		mg/kg	0.59	1	12/18/08 12:00	12/20/08 23:41	EPA 3050B	60,6010B	TD

Project Name: CHARLTON LANDFILL
Lab Number: L0818553
Project Number: 75398-67217
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-05
Client ID: SS-5
Sample Location: CHARLTON, MA
Matrix: Soil
Percent Solids: 80%

Date Collected: 12/15/08 11:08
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab										
Arsenic, Total	4.8		mg/kg	0.60	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
Barium, Total	80		mg/kg	0.60	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
Cadmium, Total	ND		mg/kg	0.60	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
Chromium, Total	20		mg/kg	0.60	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
Lead, Total	200		mg/kg	3.0	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
Mercury, Total	0.11		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:29	EPA 7471A	64,7471A	DM
Selenium, Total	ND		mg/kg	3.0	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD
Silver, Total	ND		mg/kg	0.60	1	12/18/08 12:00	12/20/08 23:43	EPA 3050B	60,6010B	TD

Project Name: CHARLTON LANDFILL
Lab Number: L0818553
Project Number: 75398-67217
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-06
Client ID: SS-6
Sample Location: CHARLTON, MA
Matrix: Soil
Percent Solids: 83%

Date Collected: 12/15/08 11:10
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab										
Arsenic, Total	7.2		mg/kg	0.58	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
Barium, Total	230		mg/kg	0.58	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
Cadmium, Total	ND		mg/kg	0.58	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
Chromium, Total	19		mg/kg	0.58	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
Lead, Total	280		mg/kg	2.9	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
Mercury, Total	0.70		mg/kg	0.09	1	12/19/08 18:00	12/22/08 13:30	EPA 7471A	64,7471A	DM
Selenium, Total	ND		mg/kg	2.9	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD
Silver, Total	ND		mg/kg	0.58	1	12/18/08 12:00	12/20/08 23:46	EPA 3050B	60,6010B	TD

Project Name: CHARLTON LANDFILL
Lab Number: L0818553
Project Number: 75398-67217
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-07
Client ID: SS-7
Sample Location: CHARLTON, MA
Matrix: Soil
Percent Solids: 84%

Date Collected: 12/15/08 11:12
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab										
Arsenic, Total	6.4		mg/kg	0.57	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
Barium, Total	53		mg/kg	0.57	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
Cadmium, Total	ND		mg/kg	0.57	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
Chromium, Total	21		mg/kg	0.57	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
Lead, Total	98		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
Mercury, Total	0.53		mg/kg	0.09	1	12/19/08 18:00	12/22/08 13:32	EPA 7471A	64,7471A	DM
Selenium, Total	ND		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD
Silver, Total	ND		mg/kg	0.57	1	12/18/08 12:00	12/20/08 23:49	EPA 3050B	60,6010B	TD

Project Name: CHARLTON LANDFILL
Lab Number: L0818553
Project Number: 75398-67217
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-08
Client ID: SS-8
Sample Location: CHARLTON, MA
Matrix: Soil
Percent Solids: 85%

Date Collected: 12/15/08 11:14
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab										
Arsenic, Total	7.2		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
Barium, Total	68		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
Cadmium, Total	ND		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
Chromium, Total	17		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
Lead, Total	140		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
Mercury, Total	0.84		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:34	EPA 7471A	64,7471A	DM
Selenium, Total	ND		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD
Silver, Total	ND		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:52	EPA 3050B	60,6010B	TD

Project Name: CHARLTON LANDFILL
Lab Number: L0818553
Project Number: 75398-67217
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-09
Client ID: SS-9
Sample Location: CHARLTON, MA
Matrix: Soil
Percent Solids: 83%

Date Collected: 12/15/08 11:16
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab										
Arsenic, Total	3.5		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
Barium, Total	35		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
Cadmium, Total	ND		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
Chromium, Total	11		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
Lead, Total	38		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
Mercury, Total	0.19		mg/kg	0.10	1	12/19/08 18:00	12/22/08 13:36	EPA 7471A	64,7471A	DM
Selenium, Total	ND		mg/kg	2.8	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD
Silver, Total	ND		mg/kg	0.56	1	12/18/08 12:00	12/20/08 23:55	EPA 3050B	60,6010B	TD

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-10 Date Collected: 12/15/08 11:18

Client ID: SS-10 Date Received: 12/17/08

Sample Location: CHARLTON, MA Field Prep: Not Specified

Matrix: Soil

Percent Solids: 82%

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab										
Arsenic, Total	7.3		mg/kg	0.59	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
Barium, Total	54		mg/kg	0.59	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
Cadmium, Total	ND		mg/kg	0.59	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
Chromium, Total	21		mg/kg	0.59	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
Lead, Total	100		mg/kg	3.0	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
Mercury, Total	ND		mg/kg	0.09	1	12/19/08 18:00	12/22/08 13:37	EPA 7471A	64,7471A	DM
Selenium, Total	ND		mg/kg	3.0	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD
Silver, Total	ND		mg/kg	0.59	1	12/18/08 12:00	12/21/08 00:13	EPA 3050B	60,6010B	TD

Project Name: CHARLTON LANDFILL **Lab Number:** L0818553

Project Number: 75398-67217 **Report Date:** 11/16/09

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 02-10 Batch: WG347690-1									
Arsenic, Total	ND		mg/kg	0.50	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
Barium, Total	ND		mg/kg	0.50	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
Cadmium, Total	ND		mg/kg	0.50	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
Chromium, Total	0.83		mg/kg	0.50	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
Lead, Total	ND		mg/kg	2.5	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
Selenium, Total	ND		mg/kg	2.5	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD
Silver, Total	ND		mg/kg	0.50	1	12/18/08 12:00	12/20/08 23:10	60,6010B	TD

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01 Batch: WG347873-1									
Arsenic, Total	ND		mg/kg	0.50	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
Barium, Total	ND		mg/kg	0.50	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
Cadmium, Total	ND		mg/kg	0.50	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
Chromium, Total	ND		mg/kg	0.50	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
Lead, Total	ND		mg/kg	2.5	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
Selenium, Total	ND		mg/kg	2.5	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG
Silver, Total	ND		mg/kg	0.50	1	12/19/08 14:30	12/23/08 10:19	60,6010B	MG

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-10 Batch: WG347882-1									
Mercury, Total	ND		mg/kg	0.08	1	12/19/08 18:00	12/22/08 12:53	64,7471A	DM

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

Method Blank Analysis
Batch Quality Control

Prep Information

Digestion Method: EPA 7471A

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL

Project Number: 75398-67217

Lab Number: L0818553

Report Date: 11/16/09

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Westborough Lab Associated sample(s): 02-10 Batch: WG347690-2 WG347690-3								
Arsenic, Total	100		99		75-125	1		30
Barium, Total	94		93		75-125	1		30
Cadmium, Total	103		98		75-125	5		30
Chromium, Total	101		97		75-125	4		30
Lead, Total	99		94		75-125	5		30
Selenium, Total	97		94		75-125	3		30
Silver, Total	102		98		75-125	4		30
MCP Total Metals - Westborough Lab Associated sample(s): 01 Batch: WG347873-2 WG347873-3								
Arsenic, Total	100		102		75-125	2		30
Barium, Total	99		98		75-125	1		30
Cadmium, Total	103		104		75-125	1		30
Chromium, Total	102		102		75-125	0		30
Lead, Total	99		100		75-125	1		30
Selenium, Total	98		98		75-125	0		30
Silver, Total	98		102		75-125	4		30
MCP Total Metals - Westborough Lab Associated sample(s): 01-10 Batch: WG347882-2 WG347882-3								
Mercury, Total	99		97		75-125	2		30

INORGANICS
&
MISCELLANEOUS

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-01
Client ID: SS-1
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:00
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Solids, Total	79		%	0.10	1	-	12/21/08 14:35	30,2540G	NM

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-02
Client ID: SS-2
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:02
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Solids, Total	78		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-03
Client ID: SS-3
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:04
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Solids, Total	84		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-04
Client ID: SS-4
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:06
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Solids, Total	84		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-05
Client ID: SS-5
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:08
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Solids, Total	80		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-06
Client ID: SS-6
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:10
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Solids, Total	83		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-07
Client ID: SS-7
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:12
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Solids, Total	84		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-08
Client ID: SS-8
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:14
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Solids, Total	85		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-09
Client ID: SS-9
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:16
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Solids, Total	83		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217
Lab Number: L0818553
Report Date: 11/16/09

SAMPLE RESULTS

Lab ID: L0818553-10
Client ID: SS-10
Sample Location: CHARLTON, MA
Matrix: Soil
Date Collected: 12/15/08 11:18
Date Received: 12/17/08
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Solids, Total	82		%	0.10	1	-	12/19/08 11:25	30,2540G	SL

Lab Duplicate Analysis
Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 11/16/09

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02-10 QC Batch ID: WG347822-1 QC Sample: L0818443-03 Client ID: DUP Sample						
Solids, Total	70	72	%	3		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG347935-1 QC Sample: L0818480-02 Client ID: DUP Sample						
Solids, Total	80	82	%	2		20

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 11/16/09

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis
L0818553-01A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-02A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-03A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-04A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-05A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-06A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)

*Hold days indicated by values in parentheses

Project Name: CHARLTON LANDFILL
Project Number: 75398-67217

Lab Number: L0818553
Report Date: 11/16/09

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis
L0818553-07A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-08A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-09A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)
L0818553-10A	Amber 250ml unpreserved	A	N/A	2.2 c	Y	Absent	MCP-BA-6010T(180),MCP-AS-6010T(180),EPH-DELUX-04(14),TS(7),MCP-PB-6010T(180),MCP-AG-6010T(180),MCP-SE-6010T(180),MCP-7471T(28),MCP-CD-6010T(180),MCP-CR-6010T(180)

*Hold days indicated by values in parentheses

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

GLOSSARY

Acronyms

EPA · Environmental Protection Agency.

LCS · Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD · Laboratory Control Sample Duplicate: Refer to LCS.

MS · Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD · Matrix Spike Sample Duplicate: Refer to MS.

NA · Not Applicable.

NC · Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

ND · Not detected at the reported detection limit for the sample.

NI · Not Ignitable.

RDL · Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD · Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RDL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

Report Format: Data Usability Report

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L0818553
Project Number:	75398-67217	**Report Date:**	11/16/09

REFERENCES

30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

60 Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). May 2004.

61 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH). Massachusetts Department of Environmental Protection, DEA/ORS/BWSC. May 2004, Revision 1.1.

64 Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). August 2004.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certificate/Approval Program Summary

Last revised October 22, 2009 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. ***NELAP Accredited Solid Waste/Soil.***

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Haloacetic Acids, Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP), Ethylene Dibromide (EDB).)
Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Calcium Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH.)
Solid Waste/Soil (Inorganic Parameters: Lead in Paint, pH, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), Reactivity. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dicamba, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Volatile Organics, Acid Extractables (Phenols), 3.3'-Dichlorobenzidine, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Maine Department of Human Services Certificate/Lab ID: 2009024.
Drinking Water (Inorganic Parameters: SM9215B, 9221E, 9222B, 9222D, 9223B, EPA 180.1, 300.0, 353.2, SM2130B, 2320B, 4500Cl-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H+B,4500NO3-F, EPA 200.7, EPA 200.8, 245.1. Organic Parameters: 504.1, 524.2, SM 6251B.)
Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, Lachat 10-107-06-1-B, SM2320B, 2340B, 2510B, 2540C, 2540D, 426C, 4500Cl-D, 4500Cl-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NH3-H, 4500NO3-F, 4500P-B.5, 4500P-E, 5210B, 5220D, 5310C, EPA 200.7, 200.8, 245.1. Organic Parameters: 608, 624.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.
Drinking Water
Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl)
(EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate)
353.2 for: Nitrate-N, Nitrite-N; SM4500NO3-F, 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, 2320B, SM2540C, SM4500H-B.
Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics)
(504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), 314.0, 332.
Microbiology Parameters: SM9215B; MF-SM9222B; ENZ. SUB. SM9223; EC-SM9221E; MF-SM9222D
Non-Potable Water
Inorganic Parameters:, (EPA 200.8 for: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn)
(EPA 200.7 for: Al,Sb,As,Be,Cd,Cr,Co,Cu,Fe,Pb,Mn,Mo,Ni,Se,Ag,Sr,Tl,Ti,V,Zn,Ca,Mg,Na,K)
245.1, SM4500H,B, EPA 120.1, SM2510B, 2540C, 2540B, 2340B, 2320B, 4500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia-N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Nitrate-N, SM4500NH3-B,C-Titr, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 5310C, 4500CN-CE, 2540D, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1
Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics)
(608 for: Chlordane, Aldrin, Dieldrin, DDD, DDE, DDT, Heptachlor, Heptachlor Epoxide, PCBs-Water), EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables, 600/4-81-045-PCB-Oil

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM6215B, 9222B, 9223B Colilert, EPA 200.7, 200.8, 245.2, 120.1, 300.0, 314.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 331.0. Organic Parameters: 504.1, 524.2, SM6251B.)
Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 200.7, 200.8, 245.1, 245.2, SW-846 6010B, 6020, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 351.1, 353.2, 420.1, 1664A, SW-846 9010, 9030, 9040B, SM426C, SM2310B, 2540B, 2540D, 4500H+B, 4500NH3-H, 4500NH3-E, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 2320B, 2540C, 4500F-C, 5310C, 5540C, LACHAT 10-117-07-1-B, LACHAT 10-107-06-1-B, LACHAT 10-107-04-1-C, LACHAT 10-107-04-1-J, LACHAT 10-117-07-1-A, SM4500CL-E, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D. Organic Parameters: SW-846 3005A, 3015A, 3510C, 5030B, 8021B, 8260B, 8270C, 8330, EPA 624, 625, 608, SW-846 8082, 8081A.)
Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 7196A, 7471A, 7.3.3.2, 7.3.4.2, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040, 9045C, 9050C, 1311, 3005A, 3050B, 3051A. Organic Parameters: SW-846 3540C, 3545, 3580A, 5030B, 5035, 8021B, 8260B, 8270C, 8330, 8151A, 8082, 8081A.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9223B, 9215B, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 2540C, 2320B, 314.0, SM2120B, 2510B, 5310C, SM4500H-B, EPA 200.8, 245.2. Organic Parameters: 504.1, SM6251B, 524.2.)
Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500Cl-D, EPA 300.0, SM2120B, SM4500F-BC, EPA 200.7, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM4500P-B5+E, 2540B, 2540C, 2540D, EPA 120.1, SM2510B, SM15 426C, SM9221CE, 9222D, 9221B, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, SM5210B, SW-846 3015, 6020, 7470A, 5540C, 4500H-B, EPA 200.8, SM3500Cr-D, EPA 245.1, 245.2, SW-846 9040B, 3005A, EPA 6010B, 7196A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8270C, 3510C, EPA 608, 624, 625, SW-846 5030B, 8021B, 8081A, 8082, 8151A, 8330, NJ OQA-QAM-025 Rev.7.)
Solid & Chemical Materials (Inorganic Parameters: SW-846 9040B, 3005A, 6010B, 7196A, 5030B, 9010B, 9030B, 1030, 1311, 3050B, 3051, 7471A, 9014, 9012A, 9045C, 9050A, 9065. Organic Parameters: SW-846 8021B, 8081A, 8082, 8151A, 8330, 8260B, 8270C, 1311, 1312, 3540C, 3545, 3550B, 3580A, 5035L, 5035H, NJ OQA-QAM-025 Rev.7.)

New York Department of Health Certificate/Lab ID: 11148. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200.7, 245.2, SM5310C, EPA 314.0, 332.0, SM2320B, EPA 300.0, SM2120B, 4500CN-E, 4500F-C, 4500H-B, 4500NO3-F, 2540C, EPA 120.1, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)
Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222B, 9215B, 5210B, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, LACHAT 10-117-07-1A or B, SM4500Cl-E, 4500F-C, SM15 426C, EPA 350.1, LACHAT 10-107-06-1-B, SM4500NH3-H, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, LACHAT 10-107-041-C, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6020, EPA 7196A, S\M3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, SM4500-CN-E LACHAT 10-204-00-1-A, EPA 9040B, SM4500-HB, EPA 1664A, SM5310C, EPA 420.1, SM14 510C, EPA 120.1, SM2510B, SM4500S-D, SM5540C, EPA 3005A, 3015. Organic Parameters: EPA 624, 8260B, 8270C, 625, 608, 8081A, 8151A, 8330, 8082, EPA 3510C, 5030B, 9010B, 9030B.)
Solid & Hazardous Waste (Inorganic Parameters: 1010, 1030, SW-846 Ch 7 Sec 7.3, EPA 6010B, 7196A, 7471A, 9012A, 9014, 9040B, 9045C, 9065, 9050, EPA 1311, 1312, 3005A, 3050B, 9010B, 9030B. Organic Parameters: EPA 8260B, 8270C, 8081A, 8151A, 8330, 8082, 3540C, 3545, 3546, 3580, 5030B, 5035.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. Organic Parameters: MA-EPH, MA-VPH.

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. ***NELAP Accredited.***
Non-Potable Water (Organic Parameters: EPA 3510C, 5030B, 625, 624. 608, 8081A, 8082, 8151A, 8260B, 8270C, 8330)
Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, 1311, 3050B, 3051, 6010B, EPA 7.3.3.2, EPA 7.3.4.2, 7196A, 7471A, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065. Organic Parameters: 3540C, 3545, 3580A, 5035, 8021B, 8081A, 8082, 8151A, 8260B, 8270C, 8330)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. ***NELAP Accredited via NY-DOH.***
Refer to MA-DEP Certificate for Potable and Non-Potable Water.
Refer to NY-DOH Certificate for Potable and Non-Potable Water.

Utah Department of Health Certificate/Lab ID: AAMA. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: Chloride EPA 300.0)

Analytes Not Accredited by NELAP

Certification is not available by NELAP for the following analytes: **EPA 8260B:** Freon-113, 1,2,4,5-Tetramethylbenzene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl naphthalene, Dimethyl naphthalene, Total Methylnapthalenes, Total Dimethylnaphthalenes. **EPA 625:** 4-Chloroaniline. **EPA 350.1** for Ammonia in a Soil matrix.

CHAIN OF CUSTODY

PAGE _____ OF _____

Eight Walkup Drive Westborough, MA 01581
TEL: 508-898-9220 FAX: 508-898-9193

Date Rec'd in Lab: 12/17

ALPHA Job #: L0815553

Client Information

Client: CDM
Address: 50 Hampshire Street
Cambridge, MA 02139
Phone: 617-452-6659
Fax: 617-452-6659
Email: RECCHIAVM@COM.COM

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Charlton Landfill
Project Location: Charlton, MA
Project #: 75398-67217
Project Manager: Vincent Recchia
ALPHA Quote #: 2008645

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: 12/24 Time:

Other Project Specific Requirements/Comments/Detection Limits:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MCP PRESUMPTIVE CERTAINTY - THESE QUESTIONS MUST BE ANSWERED

☐ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Are Drinking Water Samples Submitted?
☐ Yes ☐ No Have you met minimum field QC requirements?

ANALYSIS: RCRA 8 metals; EPH w/PAHs (Deluxe)

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	RCRA 8 metals	EPH w/PAHs (Deluxe)	TOTAL # BOTTLES	Sample Specific Comments
85531	SS-1	12/15/08	11:20	soil	BK	X	X		
2	SS-2		11:02			X	X		
3	SS-3		11:01			X	X		
4	SS-4		11:06			X	X		
5	SS-5		11:08			X	X		
6	SS-6		11:10			X	X		
7	SS-7		11:12			X	X		
8	SS-8		11:14			X	X		
9	SS-9		11:16			X	X		
10	SS-10		11:18			X	X		
	Container Type					A	G		
	Preservative					A	A		

QUESTIONS ABOVE MUST BE ANSWERED FOR PRESUMPTIVE CERTAINTY

IS YOUR PROJECT MCP ?

Relinquished By:	Date/Time	Received By:	Date/Time
Saint Kaulb	12/7/08 11:30	Meriam Lenkeu	12/7/08 15:15
Meriam Lenkeu	12/7/08 17:25		12/7 17:25

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.

FORM NO: 01-01

Town of Charlton
Soil Stockpile Sampling Results
December 15, 2008 and August 11, 2011

LOCATION					SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10
SAMPLING DATE					15-DEC-08	15-DEC-08	15-DEC-08	15-DEC-08	15-DEC-08	15-DEC-08	15-DEC-08	15-DEC-08	15-DEC-08	15-DEC-08
LAB SAMPLE ID					L0818553-01	L0818553-02	L0818553-03	L0818553-04	L0818553-05	L0818553-06	L0818553-07	L0818553-08	L0818553-09	L0818553-10
	MCP	BUD Values												
	S-1/GW-1	S-2/GW-1	*S-3/GW-1*	Units										
Solids, Total	N/A	N/A	N/A	%	79	78	84	84	80	83	84	85	83	82
Total Metals by MCP 6000/7000 series														
Arsenic, Total	**20**	**11**	**11**	mg/kg	7.4	5.4	5.5	5.7	4.8	7.2	6.4	7.2	3.5	7.3
Barium, Total	**1000**	**2100**	**2100**	mg/kg	72	74	46	53	80	230	53	68	35	54
Cadmium, Total	**2**	**16**	**16**	mg/kg	<0.58	<0.62	<0.55	<0.59	<0.6	<0.58	<0.57	<0.56	<0.56	<0.59
Chromium, Total	**30**	**570**	**570**	mg/kg	19	20	15	16	20	19	21	17	11	21
Lead, Total	**300**	**110**	**110**	mg/kg	***170***	***160***	92	***110***	***200***	***280***	98	***140***	38	100
Mercury, Total	**20**	**16**	**16**	mg/kg	0.19	0.2	0.65	0.54	0.11	0.7	0.53	0.84	0.19	<0.09
Selenium, Total	**400**	**390**	**390**	mg/kg	<2.9	<3.1	<2.7	<2.9	<3	<2.9	<2.8	<2.8	<2.8	<3
Silver, Total	**100**	**110**	**110**	mg/kg	<0.58	<0.62	<0.55	<0.59	<0.6	<0.58	<0.57	<0.56	<0.56	<0.59
Extractable Petroleum Hydrocarbons														
2-Methylnaphthalene	**0.7**	**0.66**	**0.66**	mg/kg	<0.422	<0.427	***<0.794***	***<0.794***	***<0.833***	<0.402	<0.397	***<0.784***	***<1.61***	<0.406
Acenaphthene	**4**	**3.9**	**3.9**	mg/kg	<0.422	<0.427	<0.794	<0.794	<0.833	<0.402	<0.397	<0.784	<1.61	<0.406
Acenaphthylene	**1**	**1.1**	**1.1**	mg/kg	<0.422	<0.427	<0.794	<0.794	<0.833	<0.402	<0.397	<0.784	***<1.61***	<0.406
Anthracene	**1000**	**3000**	**5000**	mg/kg	<0.422	<0.427	<0.794	<0.794	<0.833	<0.402	<0.397	<0.784	<1.61	<0.406
Benzo(a)anthracene	**7**	**21**	**160**	mg/kg	<0.422	0.529	1.51	1.34	<0.833	1.21	0.85	1.24	<1.61	<0.406
Benzo(a)pyrene	**2**	**2.1**	**16**	mg/kg	<0.422	0.604	1.52	1.31	<0.833	1.4	0.923	1.31	<1.61	<0.406
Benzo(b)fluoranthene	**7**	**21**	**160**	mg/kg	<0.422	0.54	1.33	1.1	<0.833	1.12	0.763	1.17	<1.61	<0.406
Benzo(ghi)perylene	**1000**	**3000**	**5000**	mg/kg	<0.422	<0.427	0.808	<0.794	<0.833	0.769	0.537	<0.784	<1.61	<0.406
Benzo(k)fluoranthene	**70**	**210**	**1600**	mg/kg	<0.422	0.652	1.41	1.16	<0.833	1.13	0.76	1.08	<1.61	<0.406
C11-C22 Aromatics	-	-	-	mg/kg	25.4	51.1	111	107	105	93.5	59.7	158	57.5	30.8
C11-C22 Aromatics, Adjusted	**1000**	**48**	**48**	mg/kg	22.6	44.7	***91.8***	***91.2***	***104***	***79.2***	***49.9***	***143***	***57.5***	29.6
C19-C36 Aliphatics	**3000**	**5000**	**5000**	mg/kg	15.7	33.6	66.6	70.6	94.7	62.9	49.8	122	35.1	27.6
C9-C18 Aliphatics	**1000**	**3000**	**5000**	mg/kg	<8.44	<8.55	<15.9	<15.9	<16.7	8.95	<7.94	<15.7	<32.1	<8.13
Chrysene	**70**	**2100**	**3400**	mg/kg	0.462	0.646	1.82	1.56	<0.833	1.44	0.948	1.5	<1.61	<0.406
Dibenzo(a,h)anthracene	**0.7**	**2.1**	**16**	mg/kg	<0.422	<0.427	<0.794	<0.794	<0.833	<0.402	<0.397	<0.784	<1.61	<0.406
Fluoranthene	**1000**	**3000**	**5000**	mg/kg	0.858	1.21	3.67	2.79	0.857	2.22	1.66	2.85	<1.61	0.61
Fluorene	**1000**	**3000**	**5000**	mg/kg	<0.422	<0.427	<0.794	<0.794	<0.833	<0.402	<0.397	<0.784	<1.61	<0.406
Indeno(1,2,3-cd)Pyrene	**7**	**21**	**160**	mg/kg	<0.422	0.435	0.991	0.822	<0.833	0.902	0.615	0.868	<1.61	<0.406
Naphthalene	**4**	**0.66**	**0.66**	mg/kg	<0.422	<0.427	***<0.794***	***<0.794***	***<0.833***	<0.402	<0.397	***<0.784***	***<1.61***	<0.406
Phenanthrene	**10**	**10**	**10**	mg/kg	0.638	0.668	2.79	2.49	<0.833	1.71	1.06	2.43	<1.61	<0.406
Pyrene	**1000**	**3000**	**5000**	mg/kg	0.756	1.15	3.16	2.99	<0.833	2.35	1.71	2.8	<1.61	0.589

Notes:
1. Gray shaded areas: Concentration exceeds the S-1/ GW-1 standards per the MCP, version dated 12/14/2007.
2. Red bolded text: Concentration exceeds the S-2/GW-1 BUD values, per Table 7 of the proposed BUD chemical specific values as part of the Draft beneficial Use Determination (BUD) Guidance document, dated March 2004.
3. Italicized text: Concentration exceeds the S-3/GW-1 BUD values, per Table 10 of the proposed BUD chemical specific values as part of the Draft Beneficial Use Determination (BUD) Guidance document, dated March 2004.

Town of Charlton
Soil Stockpile Sampling Results
December 15, 2008 and August 11, 2011

LOCATION					SP-1	SP-2	SP-3	SP-4	SP-5	SP-6	SP-7	SP-8	SP-9	SP-10
SAMPLING DATE					11-AUG-11	11-AUG-11	11-AUG-11	11-AUG-11	11-AUG-11	11-AUG-11	11-AUG-11	11-AUG-11	11-AUG-11	11-AUG-11
LAB SAMPLE ID					L1112235-11	L1112235-12	L1112235-13	L1112235-14	L1112235-15	L1112235-16	L1112235-17	L1112235-18	L1112235-19	L1112235-20
	MCP	BUD Values												
	S-1/GW-1	S-2/GW-1	*S-3/GW-1*	Units										
Solids, Total	N/A	N/A	N/A	%	88	86	86	85	85	85	84	85	85	86
Total Metals by MCP 6000/7000 series														
Arsenic, Total	**20**	**11**	**11**	mg/kg	5.5	7.5	7.1	6.7	6.9	6.3	6.3	7.9	***12***	7
Barium, Total	**1000**	**2100**	**2100**	mg/kg	60	68	76	72	76	73	86	140	67	68
Cadmium, Total	**2**	**16**	**16**	mg/kg	<0.41	<0.43	<0.44	<0.44	<0.45	<0.43	<0.43	<0.45	<0.44	<0.42
Chromium, Total	**30**	**570**	**570**	mg/kg	36	38	32	33	35	33	43	50	35	36
Lead, Total	**300**	**110**	**110**	mg/kg	18	52	67	75	90	82	32	52	56	40
Mercury, Total	**20**	**16**	**16**	mg/kg	<0.08	0.16	0.16	0.23	0.18	0.28	0.08	0.24	0.2	0.1
Selenium, Total	**400**	**390**	**390**	mg/kg	<2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.1
Silver, Total	**100**	**110**	**110**	mg/kg	<0.41	<0.43	<0.44	<0.44	<0.45	<0.43	<0.43	<0.45	<0.44	<0.42
Extractable Petroleum Hydrocarbons														
2-Methylnaphthalene	**0.7**	**0.66**	**0.66**	mg/kg	<0.36	<0.362	<0.368	<0.376	0.377	<0.388	<0.385	<0.386	<0.361	<0.382
Acenaphthene	**4**	**3.9**	**3.9**	mg/kg	<0.36	<0.362	<0.368	<0.376	0.534	<0.388	<0.385	<0.386	<0.361	<0.382
Acenaphthylene	**1**	**1.1**	**1.1**	mg/kg	<0.36	<0.362	<0.368	<0.376	<0.369	<0.388	<0.385	<0.386	<0.361	<0.382
Anthracene	**1000**	**3000**	**5000**	mg/kg	<0.36	<0.362	<0.368	<0.376	0.986	1.01	<0.385	<0.386	<0.361	<0.382
Benzo(a)anthracene	**7**	**21**	**160**	mg/kg	<0.36	<0.362	0.506	<0.376	1.26	1.94	<0.385	<0.386	<0.361	0.475
Benzo(a)pyrene	**2**	**2.1**	**16**	mg/kg	<0.36	<0.362	0.592	<0.376	1.37	1.88	<0.385	<0.386	<0.361	0.447
Benzo(b)fluoranthene	**7**	**21**	**160**	mg/kg	<0.36	<0.362	0.494	<0.376	1.05	1.55	<0.385	<0.386	<0.361	<0.382
Benzo(ghi)perylene	**1000**	**3000**	**5000**	mg/kg	<0.36	<0.362	0.612	<0.376	1.16	1.25	<0.385	<0.386	<0.361	<0.382
Benzo(k)fluoranthene	**70**	**210**	**1600**	mg/kg	<0.36	<0.362	<0.368	<0.376	1	1.37	<0.385	<0.386	<0.361	<0.382
C11-C22 Aromatics	-	-	-	mg/kg	<7.2	25.6	44.9	21.2	107	95	24.5	29.1	<7.23	23
C11-C22 Aromatics, Adjusted	**1000**	**48**	**48**	mg/kg	<7.2	24.2	38.7	19.6	***85.1***	***69.5***	24.5	29.1	<7.23	18.3
C19-C36 Aliphatics	**3000**	**5000**	**5000**	mg/kg	<7.2	10.1	39.9	17	49.5	34.3	<7.7	<7.72	<7.23	<7.64
C9-C18 Aliphatics	**1000**	**3000**	**5000**	mg/kg	<7.2	<7.24	<7.36	<7.53	8.47	19.5	<7.7	<7.72	<7.23	<7.64
Chrysene	**70**	**2100**	**3400**	mg/kg	<0.36	<0.362	0.557	<0.376	1.3	2	<0.385	<0.386	<0.361	0.46
Dibenzo(a,h)anthracene	**0.7**	**2.1**	**16**	mg/kg	<0.36	<0.362	<0.368	<0.376	<0.369	<0.388	<0.385	<0.386	<0.361	<0.382
Fluoranthene	**1000**	**3000**	**5000**	mg/kg	<0.36	0.533	1.12	0.545	3.31	4.49	<0.385	<0.386	<0.361	1.22
Fluorene	**1000**	**3000**	**5000**	mg/kg	<0.36	<0.362	<0.368	<0.376	0.593	0.47	<0.385	<0.386	<0.361	<0.382
Indeno(1,2,3-cd)Pyrene	**7**	**21**	**160**	mg/kg	<0.36	<0.362	0.381	<0.376	0.814	1.04	<0.385	<0.386	<0.361	<0.382
Naphthalene	**4**	**0.66**	**0.66**	mg/kg	<0.36	<0.362	<0.368	<0.376	***1.06***	0.465	<0.385	<0.386	<0.361	<0.382
Phenanthrene	**10**	**10**	**10**	mg/kg	<0.36	0.381	0.855	0.426	3.71	4.15	<0.385	<0.386	<0.361	1.2
Pyrene	**1000**	**3000**	**5000**	mg/kg	<0.36	0.518	1.07	0.549	3.05	3.93	<0.385	<0.386	<0.361	0.978

Notes:
1. Gray shaded areas: Concentration exceeds the S-1/ GW-1 standards per the MCP, version dated 12/14/2007.
2. Red bolded text: Concentration exceeds the S-2/GW-1 BUD values, per Table 7 of the proposed BUD chemical specific values as part of the Draft beneficial Use Determination (BUD) Guidance document, dated March 2004.
3. Italicized text: Concentration exceeds the S-3/GW-1 BUD values, per Table 10 of the proposed BUD chemical specific values as part of the Draft Beneficial Use Determination (BUD) Guidance document, dated March 2004.

Town of Charlton
Soil Stockpile Sampling Results
December 15, 2008 and August 11, 2011

LOCATION					SP-11	SP-12	SP-13	SP-14	SP-15	2008 Samples	2011 Samples
SAMPLING DATE					11-AUG-11	11-AUG-11	11-AUG-11	11-AUG-11	11-AUG-11		
LAB SAMPLE ID					L1112235-21	L1112235-22	L1112235-23	L1112235-24	L1112235-25	range of results	range of results
	MCP	BUD Values									
	S-1/GW-1	S-2/GW-1	*S-3/GW-1*	Units							
Solids, Total	N/A	N/A	N/A	%	85	82	84	86	84		
Total Metals by MCP 6000/7000 series											
Arsenic, Total	**20**	**11**	**11**	mg/kg	6.7	7.4	6.2	6.2	6.6	3.5-7.4	5.5-12
Barium, Total	**1000**	**2100**	**2100**	mg/kg	61	66	57	54	52	35-230	52-140
Cadmium, Total	**2**	**16**	**16**	mg/kg	<0.43	<0.45	<0.42	<0.41	<0.44	<0.55-<0.62	<0.41-<0.45
Chromium, Total	**30**	**570**	**570**	mg/kg	24	25	26	22	21	11-21	21-50
Lead, Total	**300**	**110**	**110**	mg/kg	***110***	***120***	***130***	***140***	***130***	38-280	18-140
Mercury, Total	**20**	**16**	**16**	mg/kg	0.76	0.5	0.48	0.42	0.46	<0.09-0.84	<0.08-0.76
Selenium, Total	**400**	**390**	**390**	mg/kg	<2.2	<2.2	<2.1	<2	<2.2	<2.7-<3.1	<2-<2.2
Silver, Total	**100**	**110**	**110**	mg/kg	<0.43	<0.45	<0.42	<0.41	<0.44	<0.55-<0.62	<0.41-<0.45
Extractable Petroleum Hydrocarbons											
2-Methylnaphthalene	**0.7**	**0.66**	**0.66**	mg/kg	<0.388	<0.401	<0.387	<0.387	<0.394	<0.397-<1.61	<0.36-0.377
Acenaphthene	**4**	**3.9**	**3.9**	mg/kg	<0.388	<0.401	<0.387	<0.387	<0.394	<0.397-<1.61	<0.36-0.534
Acenaphthylene	**1**	**1.1**	**1.1**	mg/kg	<0.388	<0.401	<0.387	<0.387	<0.394	<0.397-<1.61	<0.36-<0.401
Anthracene	**1000**	**3000**	**5000**	mg/kg	<0.388	0.497	0.445	<0.387	0.42	<0.397-<1.61	<0.36-1.01
Benzo(a)anthracene	**7**	**21**	**160**	mg/kg	0.977	1.17	1.06	0.844	1.06	<0.406-1.51	<0.36-1.94
Benzo(a)pyrene	**2**	**2.1**	**16**	mg/kg	1.08	1.42	1.28	0.9	1.08	<0.406-1.52	<0.36-1.88
Benzo(b)fluoranthene	**7**	**21**	**160**	mg/kg	0.598	0.886	0.78	0.867	0.929	<0.406-1.33	<0.36-1.55
Benzo(ghi)perylene	**1000**	**3000**	**5000**	mg/kg	0.464	0.633	0.68	0.813	0.934	<0.406-0.88	<0.36-1.25
Benzo(k)fluoranthene	**70**	**210**	**1600**	mg/kg	0.721	0.962	0.838	0.561	0.796	<0.406-1.41	<0.36-1.37
C11-C22 Aromatics	-	-	-	mg/kg	72.2	68.8	104	83.5	101	25.4-158	<7.2-107
C11-C22 Aromatics, Adjusted	**1000**	**48**	**48**	mg/kg	***62***	***55.2***	***91.3***	***73.2***	***88***	22.6-143	<7.2-91.3
C19-C36 Aliphatics	**3000**	**5000**	**5000**	mg/kg	100	107	108	79	141	15.7-122	<7.2-141
C9-C18 Aliphatics	**1000**	**3000**	**5000**	mg/kg	10.1	8.16	<7.74	<7.74	<7.87	<7.2-19.5	<7.2-19.5
Chrysene	**70**	**2100**	**3400**	mg/kg	0.964	1.13	1.08	0.824	1.08	<0.406-1.82	<0.36-2
Dibenzo(a,h)anthracene	**0.7**	**2.1**	**16**	mg/kg	<0.388	<0.401	<0.387	<0.387	<0.394	<0.397-<1.61	<0.36-<0.401
Fluoranthene	**1000**	**3000**	**5000**	mg/kg	1.74	2.31	1.9	1.74	2.28	<1.61-3.67	<0.36-4.49
Fluorene	**1000**	**3000**	**5000**	mg/kg	<0.388	<0.401	<0.387	<0.387	<0.394	<0.397-<1.61	<0.36-4.49
Indeno(1,2,3-cd)Pyrene	**7**	**21**	**160**	mg/kg	0.516	0.702	0.675	0.574	0.634	<0.406-0.991	<0.36-0.47
Naphthalene	**4**	**0.66**	**0.66**	mg/kg	<0.388	<0.401	<0.387	<0.387	<0.394	<0.397-<1.61	<0.36-1.06
Phenanthrene	**10**	**10**	**10**	mg/kg	1.44	1.77	1.78	1.39	1.8	<0.406-2.79	<0.36-4.15
Pyrene	**1000**	**3000**	**5000**	mg/kg	1.77	2.18	2.09	1.8	2.38	<0.833-3.16	<0.36-3.93

Notes:
1. Gray shaded areas: Concentration exceeds the S-1/ GW-1 standards per the MCP, version dated 12/14/2007.
2. Red bolded text: Concentration exceeds the S-2/GW-1 BUD values, per Table 7 of the proposed BUD chemical specific values as part of the Draft beneficial Use Determination (BUD) Guidance document, dated March 2004.
3. Italicized text: Concentration exceeds the S-3/GW-1 BUD values, per Table 10 of the proposed BUD chemical specific values as part of the Draft Beneficial Use Determination (BUD) Guidance document, dated March 2004.

ANALYTICAL REPORT

Lab Number:	L1112235
Client:	Camp Dresser & McKee, Inc. 1 Cambridge Place 50 Hampshire Street Cambridge, MA 02139
ATTN:	Laura Bugay
Phone:	(617) 452-6589
Project Name:	CHARLTON LANDFILL
Project Number:	75398-72037
Report Date:	08/23/11

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (2003), NJ (MA935), RI (LAO00065), ME (MA0086), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1112235-01	SE-1	CHARLTON, MASSACHUSETTS	08/11/11 09:30
L1112235-02	SE-2	CHARLTON, MASSACHUSETTS	08/11/11 09:45
L1112235-03	SE-3	CHARLTON, MASSACHUSETTS	08/11/11 10:00
L1112235-04	SE-4	CHARLTON, MASSACHUSETTS	08/11/11 10:15
L1112235-05	SE-5	CHARLTON, MASSACHUSETTS	08/11/11 10:30
L1112235-06	PR-1	CHARLTON, MASSACHUSETTS	08/11/11 08:00
L1112235-07	PR-2	CHARLTON, MASSACHUSETTS	08/11/11 08:20
L1112235-08	PR-3	CHARLTON, MASSACHUSETTS	08/11/11 08:35
L1112235-09	PR-4	CHARLTON, MASSACHUSETTS	08/11/11 08:55
L1112235-10	PR-5	CHARLTON, MASSACHUSETTS	08/11/11 09:10
L1112235-11	SP-1	CHARLTON, MASSACHUSETTS	08/11/11 06:40
L1112235-12	SP-2	CHARLTON, MASSACHUSETTS	08/11/11 06:45
L1112235-13	SP-3	CHARLTON, MASSACHUSETTS	08/11/11 06:50
L1112235-14	SP-4	CHARLTON, MASSACHUSETTS	08/11/11 06:55
L1112235-15	SP-5	CHARLTON, MASSACHUSETTS	08/11/11 07:00
L1112235-16	SP-6	CHARLTON, MASSACHUSETTS	08/11/11 07:05
L1112235-17	SP-7	CHARLTON, MASSACHUSETTS	08/11/11 07:10
L1112235-18	SP-8	CHARLTON, MASSACHUSETTS	08/11/11 07:15
L1112235-19	SP-9	CHARLTON, MASSACHUSETTS	08/11/11 07:20
L1112235-20	SP-10	CHARLTON, MASSACHUSETTS	08/11/11 07:25
L1112235-21	SP-11	CHARLTON, MASSACHUSETTS	08/11/11 07:30
L1112235-22	SP-12	CHARLTON, MASSACHUSETTS	08/11/11 07:35
L1112235-23	SP-13	CHARLTON, MASSACHUSETTS	08/11/11 07:40
L1112235-24	SP-14	CHARLTON, MASSACHUSETTS	08/11/11 07:45
L1112235-25	SP-15	CHARLTON, MASSACHUSETTS	08/11/11 07:50

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L1112235
Project Number:	75398-72037	**Report Date:**	08/23/11

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	YES
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235
Project Number: 75398-72037 **Report Date:** 08/23/11

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

For additional information, please contact Client Services at 800-624-9220.

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Metals.

EPH

In reference to question H:

The surrogate recoveries for L1112235-19 were below the acceptance criteria for Chloro-Octadecane (25%) and o-Terphenyl (39%); however, re-extraction achieved similar results for Chloro-Octadecane (30%) and o-Terphenyl (34%). The results of both extractions are reported; however, all associated compounds are considered to have a potentially low bias.

The surrogate recovery for L1112235-25 is outside the acceptance criteria for Chloro-Octadecane (148%);

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L1112235
Project Number:	75398-72037	**Report Date:**	08/23/11

Case Narrative (continued)

however, the sample was not re-analyzed due to coelution with obvious interferences. A copy of the chromatogram is included as an attachment to this report. The results are not considered to be biased.
The WG484402-2/-3 LCS/LCSD RPDs, associated with L1112235-01 through -13, are above the acceptance criteria for C9-C18 Aliphatics (27%), C19-C36 Aliphatics (29%), Decane (C10) (29%), Dodecane (C12) (28%), Tetradecane (C14) (27%), Hexadecane (C16) (27%), Octadecane (C18) (28%), Nonadecane (C19) (29%), Eicosane (C20) (28%), Docosane (C22) (29%), Tetracosane (C24) (28%), Hexacosane (C26) (29%),Octacosane (C28) (28%), Triacontane (C30) (28%) and Hexatriacontane (C36) (28%); however, the individual LCS/LCSD recoveries are within method limits.

Metals
In reference to question I:
All samples were analyzed for a subset of MCP elements per the Chain of Custody.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Lisa Westerlind

Title: Technical Director/Representative Date: 08/23/11

ORGANICS

PETROLEUM HYDROCARBONS

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-01	Date Collected:	08/11/11 09:30
Client ID:	SE-1	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 07:31	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/17/11
Percent Solids:	92%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	6.91	--	1
C19-C36 Aliphatics	33.8		mg/kg	6.91	--	1
C11-C22 Aromatics	55.6		mg/kg	6.91	--	1
C11-C22 Aromatics, Adjusted	47.4		mg/kg	6.91	--	1
Naphthalene	ND		mg/kg	0.346	--	1
2-Methylnaphthalene	ND		mg/kg	0.346	--	1
Acenaphthylene	ND		mg/kg	0.346	--	1
Acenaphthene	ND		mg/kg	0.346	--	1
Fluorene	ND		mg/kg	0.346	--	1
Phenanthrene	0.991		mg/kg	0.346	--	1
Anthracene	ND		mg/kg	0.346	--	1
Fluoranthene	1.37		mg/kg	0.346	--	1
Pyrene	1.41		mg/kg	0.346	--	1
Benzo(a)anthracene	0.646		mg/kg	0.346	--	1
Chrysene	0.716		mg/kg	0.346	--	1
Benzo(b)fluoranthene	0.675		mg/kg	0.346	--	1
Benzo(k)fluoranthene	0.360		mg/kg	0.346	--	1
Benzo(a)pyrene	0.822		mg/kg	0.346	--	1
Indeno(1,2,3-cd)Pyrene	0.504		mg/kg	0.346	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.346	--	1
Benzo(ghi)perylene	0.715		mg/kg	0.346	--	1

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-01	Date Collected:	08/11/11 09:30
Client ID:	SE-1	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	68		40-140
o-Terphenyl	105		40-140
2-Fluorobiphenyl	97		40-140
2-Bromonaphthalene	99		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-02	Date Collected:	08/11/11 09:45
Client ID:	SE-2	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 08:03	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/17/11
Percent Solids:	90%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	7.48		mg/kg	6.97	--	1
C19-C36 Aliphatics	54.6		mg/kg	6.97	--	1
C11-C22 Aromatics	121		mg/kg	6.97	--	1
C11-C22 Aromatics, Adjusted	98.4		mg/kg	6.97	--	1
Naphthalene	ND		mg/kg	0.348	--	1
2-Methylnaphthalene	ND		mg/kg	0.348	--	1
Acenaphthylene	ND		mg/kg	0.348	--	1
Acenaphthene	0.493		mg/kg	0.348	--	1
Fluorene	0.410		mg/kg	0.348	--	1
Phenanthrene	3.54		mg/kg	0.348	--	1
Anthracene	0.791		mg/kg	0.348	--	1
Fluoranthene	3.70		mg/kg	0.348	--	1
Pyrene	3.71		mg/kg	0.348	--	1
Benzo(a)anthracene	1.76		mg/kg	0.348	--	1
Chrysene	2.00		mg/kg	0.348	--	1
Benzo(b)fluoranthene	1.31		mg/kg	0.348	--	1
Benzo(k)fluoranthene	0.882		mg/kg	0.348	--	1
Benzo(a)pyrene	1.66		mg/kg	0.348	--	1
Indeno(1,2,3-cd)Pyrene	1.01		mg/kg	0.348	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.348	--	1
Benzo(ghi)perylene	1.21		mg/kg	0.348	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-02	Date Collected:	08/11/11 09:45
Client ID:	SE-2	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	63		40-140
o-Terphenyl	101		40-140
2-Fluorobiphenyl	88		40-140
2-Bromonaphthalene	88		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-03	Date Collected:	08/11/11 10:00
Client ID:	SE-3	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 09:07	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/17/11
Percent Solids:	89%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	7.25		mg/kg	7.17	--	1
C19-C36 Aliphatics	65.7		mg/kg	7.17	--	1
C11-C22 Aromatics	103		mg/kg	7.17	--	1
C11-C22 Aromatics, Adjusted	92.1		mg/kg	7.17	--	1
Naphthalene	ND		mg/kg	0.359	--	1
2-Methylnaphthalene	ND		mg/kg	0.359	--	1
Acenaphthylene	ND		mg/kg	0.359	--	1
Acenaphthene	ND		mg/kg	0.359	--	1
Fluorene	ND		mg/kg	0.359	--	1
Phenanthrene	0.639		mg/kg	0.359	--	1
Anthracene	ND		mg/kg	0.359	--	1
Fluoranthene	0.921		mg/kg	0.359	--	1
Pyrene	0.849		mg/kg	0.359	--	1
Benzo(a)anthracene	0.462		mg/kg	0.359	--	1
Chrysene	0.578		mg/kg	0.359	--	1
Benzo(b)fluoranthene	1.35		mg/kg	0.359	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.359	--	1
Benzo(a)pyrene	1.76		mg/kg	0.359	--	1
Indeno(1,2,3-cd)Pyrene	0.933		mg/kg	0.359	--	1
Dibenzo(a,h)anthracene	1.25		mg/kg	0.359	--	1
Benzo(ghi)perylene	2.18		mg/kg	0.359	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-03	Date Collected:	08/11/11 10:00
Client ID:	SE-3	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	41		40-140
o-Terphenyl	82		40-140
2-Fluorobiphenyl	75		40-140
2-Bromonaphthalene	77		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-04	Date Collected:	08/11/11 10:15
Client ID:	SE-4	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 09:39	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/17/11
Percent Solids:	93%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	15.8		mg/kg	6.81	--	1
C19-C36 Aliphatics	24.2		mg/kg	6.81	--	1
C11-C22 Aromatics	41.7		mg/kg	6.81	--	1
C11-C22 Aromatics, Adjusted	41.4		mg/kg	6.81	--	1
Naphthalene	ND		mg/kg	0.340	--	1
2-Methylnaphthalene	ND		mg/kg	0.340	--	1
Acenaphthylene	ND		mg/kg	0.340	--	1
Acenaphthene	ND		mg/kg	0.340	--	1
Fluorene	ND		mg/kg	0.340	--	1
Phenanthrene	ND		mg/kg	0.340	--	1
Anthracene	ND		mg/kg	0.340	--	1
Fluoranthene	ND		mg/kg	0.340	--	1
Pyrene	0.354		mg/kg	0.340	--	1
Benzo(a)anthracene	ND		mg/kg	0.340	--	1
Chrysene	ND		mg/kg	0.340	--	1
Benzo(b)fluoranthene	ND		mg/kg	0.340	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.340	--	1
Benzo(a)pyrene	ND		mg/kg	0.340	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.340	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.340	--	1
Benzo(ghi)perylene	ND		mg/kg	0.340	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-04	Date Collected:	08/11/11 10:15
Client ID:	SE-4	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	59		40-140
o-Terphenyl	88		40-140
2-Fluorobiphenyl	82		40-140
2-Bromonaphthalene	81		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-05	Date Collected:	08/11/11 10:30
Client ID:	SE-5	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 08:35	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/17/11
Percent Solids:	90%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	10.6		mg/kg	7.07	--	1
C19-C36 Aliphatics	60.3		mg/kg	7.07	--	1
C11-C22 Aromatics	80.1		mg/kg	7.07	--	1
C11-C22 Aromatics, Adjusted	72.8		mg/kg	7.07	--	1
Naphthalene	ND		mg/kg	0.353	--	1
2-Methylnaphthalene	ND		mg/kg	0.353	--	1
Acenaphthylene	ND		mg/kg	0.353	--	1
Acenaphthene	ND		mg/kg	0.353	--	1
Fluorene	ND		mg/kg	0.353	--	1
Phenanthrene	1.73		mg/kg	0.353	--	1
Anthracene	ND		mg/kg	0.353	--	1
Fluoranthene	1.36		mg/kg	0.353	--	1
Pyrene	1.23		mg/kg	0.353	--	1
Benzo(a)anthracene	0.578		mg/kg	0.353	--	1
Chrysene	0.598		mg/kg	0.353	--	1
Benzo(b)fluoranthene	0.411		mg/kg	0.353	--	1
Benzo(k)fluoranthene	0.374		mg/kg	0.353	--	1
Benzo(a)pyrene	0.486		mg/kg	0.353	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.353	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.353	--	1
Benzo(ghi)perylene	0.584		mg/kg	0.353	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-05	Date Collected:	08/11/11 10:30
Client ID:	SE-5	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	55		40-140
o-Terphenyl	101		40-140
2-Fluorobiphenyl	97		40-140
2-Bromonaphthalene	99		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-06	Date Collected:	08/11/11 08:00
Client ID:	PR-1	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 01:09	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	89%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.15	--	1
C19-C36 Aliphatics	10.9		mg/kg	7.15	--	1
C11-C22 Aromatics	25.6		mg/kg	7.15	--	1
C11-C22 Aromatics, Adjusted	19.4		mg/kg	7.15	--	1
Naphthalene	ND		mg/kg	0.358	--	1
2-Methylnaphthalene	ND		mg/kg	0.358	--	1
Acenaphthylene	ND		mg/kg	0.358	--	1
Acenaphthene	ND		mg/kg	0.358	--	1
Fluorene	ND		mg/kg	0.358	--	1
Phenanthrene	0.621		mg/kg	0.358	--	1
Anthracene	ND		mg/kg	0.358	--	1
Fluoranthene	1.06		mg/kg	0.358	--	1
Pyrene	0.958		mg/kg	0.358	--	1
Benzo(a)anthracene	0.526		mg/kg	0.358	--	1
Chrysene	0.542		mg/kg	0.358	--	1
Benzo(b)fluoranthene	0.575		mg/kg	0.358	--	1
Benzo(k)fluoranthene	0.410		mg/kg	0.358	--	1
Benzo(a)pyrene	0.612		mg/kg	0.358	--	1
Indeno(1,2,3-cd)Pyrene	0.400		mg/kg	0.358	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.358	--	1
Benzo(ghi)perylene	0.558		mg/kg	0.358	--	1

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-06	Date Collected:	08/11/11 08:00
Client ID:	PR-1	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	66		40-140
o-Terphenyl	85		40-140
2-Fluorobiphenyl	83		40-140
2-Bromonaphthalene	83		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-07	Date Collected:	08/11/11 08:20
Client ID:	PR-2	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 23:04	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/19/11
Percent Solids:	92%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	6.88	--	1
C19-C36 Aliphatics	36.7		mg/kg	6.88	--	1
C11-C22 Aromatics	57.0		mg/kg	6.88	--	1
C11-C22 Aromatics, Adjusted	40.0		mg/kg	6.88	--	1
Naphthalene	ND		mg/kg	0.344	--	1
2-Methylnaphthalene	ND		mg/kg	0.344	--	1
Acenaphthylene	ND		mg/kg	0.344	--	1
Acenaphthene	ND		mg/kg	0.344	--	1
Fluorene	ND		mg/kg	0.344	--	1
Phenanthrene	1.36		mg/kg	0.344	--	1
Anthracene	ND		mg/kg	0.344	--	1
Fluoranthene	2.97		mg/kg	0.344	--	1
Pyrene	2.86		mg/kg	0.344	--	1
Benzo(a)anthracene	1.36		mg/kg	0.344	--	1
Chrysene	1.52		mg/kg	0.344	--	1
Benzo(b)fluoranthene	1.69		mg/kg	0.344	--	1
Benzo(k)fluoranthene	1.04		mg/kg	0.344	--	1
Benzo(a)pyrene	1.83		mg/kg	0.344	--	1
Indeno(1,2,3-cd)Pyrene	1.17		mg/kg	0.344	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.344	--	1
Benzo(ghi)perylene	1.09		mg/kg	0.344	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-07	Date Collected:	08/11/11 08:20
Client ID:	PR-2	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	72		40-140
o-Terphenyl	65		40-140
2-Fluorobiphenyl	57		40-140
2-Bromonaphthalene	53		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-08	Date Collected:	08/11/11 08:35
Client ID:	PR-3	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 02:13	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	92%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	6.78	--	1
C19-C36 Aliphatics	22.8		mg/kg	6.78	--	1
C11-C22 Aromatics	50.8		mg/kg	6.78	--	1
C11-C22 Aromatics, Adjusted	38.3		mg/kg	6.78	--	1
Naphthalene	ND		mg/kg	0.339	--	1
2-Methylnaphthalene	ND		mg/kg	0.339	--	1
Acenaphthylene	ND		mg/kg	0.339	--	1
Acenaphthene	ND		mg/kg	0.339	--	1
Fluorene	ND		mg/kg	0.339	--	1
Phenanthrene	1.52		mg/kg	0.339	--	1
Anthracene	0.381		mg/kg	0.339	--	1
Fluoranthene	2.01		mg/kg	0.339	--	1
Pyrene	2.05		mg/kg	0.339	--	1
Benzo(a)anthracene	1.01		mg/kg	0.339	--	1
Chrysene	1.13		mg/kg	0.339	--	1
Benzo(b)fluoranthene	0.934		mg/kg	0.339	--	1
Benzo(k)fluoranthene	0.798		mg/kg	0.339	--	1
Benzo(a)pyrene	1.13		mg/kg	0.339	--	1
Indeno(1,2,3-cd)Pyrene	0.716		mg/kg	0.339	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.339	--	1
Benzo(ghi)perylene	0.851		mg/kg	0.339	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-08	Date Collected:	08/11/11 08:35
Client ID:	PR-3	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	62		40-140
o-Terphenyl	77		40-140
2-Fluorobiphenyl	77		40-140
2-Bromonaphthalene	75		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-09	Date Collected:	08/11/11 08:55
Client ID:	PR-4	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 02:45	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	91%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	72.0		mg/kg	6.90	--	1
C19-C36 Aliphatics	77.0		mg/kg	6.90	--	1
C11-C22 Aromatics	82.1		mg/kg	6.90	--	1
C11-C22 Aromatics, Adjusted	71.0		mg/kg	6.90	--	1
Naphthalene	ND		mg/kg	0.345	--	1
2-Methylnaphthalene	ND		mg/kg	0.345	--	1
Acenaphthylene	ND		mg/kg	0.345	--	1
Acenaphthene	ND		mg/kg	0.345	--	1
Fluorene	ND		mg/kg	0.345	--	1
Phenanthrene	1.02		mg/kg	0.345	--	1
Anthracene	ND		mg/kg	0.345	--	1
Fluoranthene	1.83		mg/kg	0.345	--	1
Pyrene	1.63		mg/kg	0.345	--	1
Benzo(a)anthracene	0.924		mg/kg	0.345	--	1
Chrysene	1.12		mg/kg	0.345	--	1
Benzo(b)fluoranthene	0.933		mg/kg	0.345	--	1
Benzo(k)fluoranthene	0.832		mg/kg	0.345	--	1
Benzo(a)pyrene	1.05		mg/kg	0.345	--	1
Indeno(1,2,3-cd)Pyrene	0.694		mg/kg	0.345	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.345	--	1
Benzo(ghi)perylene	1.08		mg/kg	0.345	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-09	Date Collected:	08/11/11 08:55
Client ID:	PR-4	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	68		40-140
o-Terphenyl	87		40-140
2-Fluorobiphenyl	82		40-140
2-Bromonaphthalene	81		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-10	Date Collected:	08/11/11 09:10
Client ID:	PR-5	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 23:49	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/19/11
Percent Solids:	91%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	6.89	--	1
C19-C36 Aliphatics	29.2		mg/kg	6.89	--	1
C11-C22 Aromatics	20.0		mg/kg	6.89	--	1
C11-C22 Aromatics, Adjusted	17.6		mg/kg	6.89	--	1
Naphthalene	ND		mg/kg	0.345	--	1
2-Methylnaphthalene	ND		mg/kg	0.345	--	1
Acenaphthylene	ND		mg/kg	0.345	--	1
Acenaphthene	ND		mg/kg	0.345	--	1
Fluorene	ND		mg/kg	0.345	--	1
Phenanthrene	ND		mg/kg	0.345	--	1
Anthracene	ND		mg/kg	0.345	--	1
Fluoranthene	0.599		mg/kg	0.345	--	1
Pyrene	0.548		mg/kg	0.345	--	1
Benzo(a)anthracene	ND		mg/kg	0.345	--	1
Chrysene	0.354		mg/kg	0.345	--	1
Benzo(b)fluoranthene	0.380		mg/kg	0.345	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.345	--	1
Benzo(a)pyrene	0.478		mg/kg	0.345	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.345	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.345	--	1
Benzo(ghi)perylene	ND		mg/kg	0.345	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-10	Date Collected:	08/11/11 09:10
Client ID:	PR-5	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	84		40-140
o-Terphenyl	66		40-140
2-Fluorobiphenyl	70		40-140
2-Bromonaphthalene	71		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-11	Date Collected:	08/11/11 06:40
Client ID:	SP-1	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 04:52	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	88%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.20	--	1
C19-C36 Aliphatics	ND		mg/kg	7.20	--	1
C11-C22 Aromatics	ND		mg/kg	7.20	--	1
C11-C22 Aromatics, Adjusted	ND		mg/kg	7.20	--	1
Naphthalene	ND		mg/kg	0.360	--	1
2-Methylnaphthalene	ND		mg/kg	0.360	--	1
Acenaphthylene	ND		mg/kg	0.360	--	1
Acenaphthene	ND		mg/kg	0.360	--	1
Fluorene	ND		mg/kg	0.360	--	1
Phenanthrene	ND		mg/kg	0.360	--	1
Anthracene	ND		mg/kg	0.360	--	1
Fluoranthene	ND		mg/kg	0.360	--	1
Pyrene	ND		mg/kg	0.360	--	1
Benzo(a)anthracene	ND		mg/kg	0.360	--	1
Chrysene	ND		mg/kg	0.360	--	1
Benzo(b)fluoranthene	ND		mg/kg	0.360	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.360	--	1
Benzo(a)pyrene	ND		mg/kg	0.360	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.360	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.360	--	1
Benzo(ghi)perylene	ND		mg/kg	0.360	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-11	Date Collected:	08/11/11 06:40
Client ID:	SP-1	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	59		40-140
o-Terphenyl	72		40-140
2-Fluorobiphenyl	79		40-140
2-Bromonaphthalene	76		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-12	Date Collected:	08/11/11 06:45
Client ID:	SP-2	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 05:24	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	86%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.24	--	1
C19-C36 Aliphatics	10.1		mg/kg	7.24	--	1
C11-C22 Aromatics	25.6		mg/kg	7.24	--	1
C11-C22 Aromatics, Adjusted	24.2		mg/kg	7.24	--	1
Naphthalene	ND		mg/kg	0.362	--	1
2-Methylnaphthalene	ND		mg/kg	0.362	--	1
Acenaphthylene	ND		mg/kg	0.362	--	1
Acenaphthene	ND		mg/kg	0.362	--	1
Fluorene	ND		mg/kg	0.362	--	1
Phenanthrene	0.381		mg/kg	0.362	--	1
Anthracene	ND		mg/kg	0.362	--	1
Fluoranthene	0.533		mg/kg	0.362	--	1
Pyrene	0.518		mg/kg	0.362	--	1
Benzo(a)anthracene	ND		mg/kg	0.362	--	1
Chrysene	ND		mg/kg	0.362	--	1
Benzo(b)fluoranthene	ND		mg/kg	0.362	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.362	--	1
Benzo(a)pyrene	ND		mg/kg	0.362	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.362	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.362	--	1
Benzo(ghi)perylene	ND		mg/kg	0.362	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-12	Date Collected:	08/11/11 06:45
Client ID:	SP-2	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	45		40-140
o-Terphenyl	64		40-140
2-Fluorobiphenyl	87		40-140
2-Bromonaphthalene	86		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-13	Date Collected:	08/11/11 06:50
Client ID:	SP-3	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/13/11 00:15
Analytical Date:	08/19/11 05:56	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	86%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.36	--	1
C19-C36 Aliphatics	39.9		mg/kg	7.36	--	1
C11-C22 Aromatics	44.9		mg/kg	7.36	--	1
C11-C22 Aromatics, Adjusted	38.7		mg/kg	7.36	--	1
Naphthalene	ND		mg/kg	0.368	--	1
2-Methylnaphthalene	ND		mg/kg	0.368	--	1
Acenaphthylene	ND		mg/kg	0.368	--	1
Acenaphthene	ND		mg/kg	0.368	--	1
Fluorene	ND		mg/kg	0.368	--	1
Phenanthrene	0.855		mg/kg	0.368	--	1
Anthracene	ND		mg/kg	0.368	--	1
Fluoranthene	1.12		mg/kg	0.368	--	1
Pyrene	1.07		mg/kg	0.368	--	1
Benzo(a)anthracene	0.506		mg/kg	0.368	--	1
Chrysene	0.557		mg/kg	0.368	--	1
Benzo(b)fluoranthene	0.494		mg/kg	0.368	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.368	--	1
Benzo(a)pyrene	0.592		mg/kg	0.368	--	1
Indeno(1,2,3-cd)Pyrene	0.381		mg/kg	0.368	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.368	--	1
Benzo(ghi)perylene	0.612		mg/kg	0.368	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-13	Date Collected:	08/11/11 06:50
Client ID:	SP-3	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	70		40-140
o-Terphenyl	77		40-140
2-Fluorobiphenyl	80		40-140
2-Bromonaphthalene	77		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-14	Date Collected:	08/11/11 06:55
Client ID:	SP-4	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/15/11 13:16
Analytical Date:	08/19/11 20:06	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/19/11
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.53	--	1
C19-C36 Aliphatics	17.0		mg/kg	7.53	--	1
C11-C22 Aromatics	21.2		mg/kg	7.53	--	1
C11-C22 Aromatics, Adjusted	19.6		mg/kg	7.53	--	1
Naphthalene	ND		mg/kg	0.376	--	1
2-Methylnaphthalene	ND		mg/kg	0.376	--	1
Acenaphthylene	ND		mg/kg	0.376	--	1
Acenaphthene	ND		mg/kg	0.376	--	1
Fluorene	ND		mg/kg	0.376	--	1
Phenanthrene	0.426		mg/kg	0.376	--	1
Anthracene	ND		mg/kg	0.376	--	1
Fluoranthene	0.545		mg/kg	0.376	--	1
Pyrene	0.549		mg/kg	0.376	--	1
Benzo(a)anthracene	ND		mg/kg	0.376	--	1
Chrysene	ND		mg/kg	0.376	--	1
Benzo(b)fluoranthene	ND		mg/kg	0.376	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.376	--	1
Benzo(a)pyrene	ND		mg/kg	0.376	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.376	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.376	--	1
Benzo(ghi)perylene	ND		mg/kg	0.376	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-14	Date Collected:	08/11/11 06:55
Client ID:	SP-4	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	43		40-140
o-Terphenyl	40		40-140
2-Fluorobiphenyl	68		40-140
2-Bromonaphthalene	70		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-15	Date Collected:	08/11/11 07:00
Client ID:	SP-5	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/21/11 14:03
Analytical Date:	08/22/11 22:02	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/22/11
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	8.47		mg/kg	7.38	--	1
C19-C36 Aliphatics	49.5		mg/kg	7.38	--	1
C11-C22 Aromatics	107		mg/kg	7.38	--	1
C11-C22 Aromatics, Adjusted	85.1		mg/kg	7.38	--	1
Naphthalene	1.06		mg/kg	0.369	--	1
2-Methylnaphthalene	0.377		mg/kg	0.369	--	1
Acenaphthylene	ND		mg/kg	0.369	--	1
Acenaphthene	0.534		mg/kg	0.369	--	1
Fluorene	0.593		mg/kg	0.369	--	1
Phenanthrene	3.71		mg/kg	0.369	--	1
Anthracene	0.986		mg/kg	0.369	--	1
Fluoranthene	3.31		mg/kg	0.369	--	1
Pyrene	3.05		mg/kg	0.369	--	1
Benzo(a)anthracene	1.26		mg/kg	0.369	--	1
Chrysene	1.30		mg/kg	0.369	--	1
Benzo(b)fluoranthene	1.05		mg/kg	0.369	--	1
Benzo(k)fluoranthene	1.00		mg/kg	0.369	--	1
Benzo(a)pyrene	1.37		mg/kg	0.369	--	1
Indeno(1,2,3-cd)Pyrene	0.814		mg/kg	0.369	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.369	--	1
Benzo(ghi)perylene	1.16		mg/kg	0.369	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-15	Date Collected:	08/11/11 07:00
Client ID:	SP-5	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	77		40-140
o-Terphenyl	112		40-140
2-Fluorobiphenyl	92		40-140
2-Bromonaphthalene	91		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-16	Date Collected:	08/11/11 07:05
Client ID:	SP-6	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/21/11 14:03
Analytical Date:	08/22/11 22:33	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/22/11
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	19.5		mg/kg	7.76	--	1
C19-C36 Aliphatics	34.3		mg/kg	7.76	--	1
C11-C22 Aromatics	95.0		mg/kg	7.76	--	1
C11-C22 Aromatics, Adjusted	69.5		mg/kg	7.76	--	1
Naphthalene	0.465		mg/kg	0.388	--	1
2-Methylnaphthalene	ND		mg/kg	0.388	--	1
Acenaphthylene	ND		mg/kg	0.388	--	1
Acenaphthene	ND		mg/kg	0.388	--	1
Fluorene	0.470		mg/kg	0.388	--	1
Phenanthrene	4.15		mg/kg	0.388	--	1
Anthracene	1.01		mg/kg	0.388	--	1
Fluoranthene	4.49		mg/kg	0.388	--	1
Pyrene	3.93		mg/kg	0.388	--	1
Benzo(a)anthracene	1.94		mg/kg	0.388	--	1
Chrysene	2.00		mg/kg	0.388	--	1
Benzo(b)fluoranthene	1.55		mg/kg	0.388	--	1
Benzo(k)fluoranthene	1.37		mg/kg	0.388	--	1
Benzo(a)pyrene	1.88		mg/kg	0.388	--	1
Indeno(1,2,3-cd)Pyrene	1.04		mg/kg	0.388	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.388	--	1
Benzo(ghi)perylene	1.25		mg/kg	0.388	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-16	Date Collected:	08/11/11 07:05
Client ID:	SP-6	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	72		40-140
o-Terphenyl	108		40-140
2-Fluorobiphenyl	86		40-140
2-Bromonaphthalene	83		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-17	Date Collected:	08/11/11 07:10
Client ID:	SP-7	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/19/11 14:50
Analytical Date:	08/22/11 20:28	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/20/11
Percent Solids:	84%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.70	--	1
C19-C36 Aliphatics	ND		mg/kg	7.70	--	1
C11-C22 Aromatics	24.5		mg/kg	7.70	--	1
C11-C22 Aromatics, Adjusted	24.5		mg/kg	7.70	--	1
Naphthalene	ND		mg/kg	0.385	--	1
2-Methylnaphthalene	ND		mg/kg	0.385	--	1
Acenaphthylene	ND		mg/kg	0.385	--	1
Acenaphthene	ND		mg/kg	0.385	--	1
Fluorene	ND		mg/kg	0.385	--	1
Phenanthrene	ND		mg/kg	0.385	--	1
Anthracene	ND		mg/kg	0.385	--	1
Fluoranthene	ND		mg/kg	0.385	--	1
Pyrene	ND		mg/kg	0.385	--	1
Benzo(a)anthracene	ND		mg/kg	0.385	--	1
Chrysene	ND		mg/kg	0.385	--	1
Benzo(b)fluoranthene	ND		mg/kg	0.385	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.385	--	1
Benzo(a)pyrene	ND		mg/kg	0.385	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.385	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.385	--	1
Benzo(ghi)perylene	ND		mg/kg	0.385	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-17	Date Collected:	08/11/11 07:10
Client ID:	SP-7	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	85		40-140
o-Terphenyl	86		40-140
2-Fluorobiphenyl	89		40-140
2-Bromonaphthalene	87		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-18	Date Collected:	08/11/11 07:15
Client ID:	SP-8	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/21/11 14:03
Analytical Date:	08/22/11 23:05	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/22/11
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.72	--	1
C19-C36 Aliphatics	ND		mg/kg	7.72	--	1
C11-C22 Aromatics	29.1		mg/kg	7.72	--	1
C11-C22 Aromatics, Adjusted	29.1		mg/kg	7.72	--	1
Naphthalene	ND		mg/kg	0.386	--	1
2-Methylnaphthalene	ND		mg/kg	0.386	--	1
Acenaphthylene	ND		mg/kg	0.386	--	1
Acenaphthene	ND		mg/kg	0.386	--	1
Fluorene	ND		mg/kg	0.386	--	1
Phenanthrene	ND		mg/kg	0.386	--	1
Anthracene	ND		mg/kg	0.386	--	1
Fluoranthene	ND		mg/kg	0.386	--	1
Pyrene	ND		mg/kg	0.386	--	1
Benzo(a)anthracene	ND		mg/kg	0.386	--	1
Chrysene	ND		mg/kg	0.386	--	1
Benzo(b)fluoranthene	ND		mg/kg	0.386	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.386	--	1
Benzo(a)pyrene	ND		mg/kg	0.386	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.386	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.386	--	1
Benzo(ghi)perylene	ND		mg/kg	0.386	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-18	Date Collected:	08/11/11 07:15
Client ID:	SP-8	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	83		40-140
o-Terphenyl	80		40-140
2-Fluorobiphenyl	75		40-140
2-Bromonaphthalene	75		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-19	Date Collected:	08/11/11 07:20
Client ID:	SP-9	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/15/11 13:16
Analytical Date:	08/19/11 00:06	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.70	--	1
C19-C36 Aliphatics	ND		mg/kg	7.70	--	1
C11-C22 Aromatics	ND		mg/kg	7.70	--	1
C11-C22 Aromatics, Adjusted	ND		mg/kg	7.70	--	1
Naphthalene	ND		mg/kg	0.385	--	1
2-Methylnaphthalene	ND		mg/kg	0.385	--	1
Acenaphthylene	ND		mg/kg	0.385	--	1
Acenaphthene	ND		mg/kg	0.385	--	1
Fluorene	ND		mg/kg	0.385	--	1
Phenanthrene	ND		mg/kg	0.385	--	1
Anthracene	ND		mg/kg	0.385	--	1
Fluoranthene	ND		mg/kg	0.385	--	1
Pyrene	ND		mg/kg	0.385	--	1
Benzo(a)anthracene	ND		mg/kg	0.385	--	1
Chrysene	ND		mg/kg	0.385	--	1
Benzo(b)fluoranthene	ND		mg/kg	0.385	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.385	--	1
Benzo(a)pyrene	ND		mg/kg	0.385	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.385	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.385	--	1
Benzo(ghi)perylene	ND		mg/kg	0.385	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-19	Date Collected:	08/11/11 07:20
Client ID:	SP-9	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**25**	Q	40-140
o-Terphenyl	**39**	Q	40-140
2-Fluorobiphenyl	88		40-140
2-Bromonaphthalene	91		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-19 RE	Date Collected:	08/11/11 07:20
Client ID:	SP-9	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/19/11 14:50
Analytical Date:	08/21/11 12:01	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/20/11
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.23	--	1
C19-C36 Aliphatics	ND		mg/kg	7.23	--	1
C11-C22 Aromatics	ND		mg/kg	7.23	--	1
C11-C22 Aromatics, Adjusted	ND		mg/kg	7.23	--	1
Naphthalene	ND		mg/kg	0.361	--	1
2-Methylnaphthalene	ND		mg/kg	0.361	--	1
Acenaphthylene	ND		mg/kg	0.361	--	1
Acenaphthene	ND		mg/kg	0.361	--	1
Fluorene	ND		mg/kg	0.361	--	1
Phenanthrene	ND		mg/kg	0.361	--	1
Anthracene	ND		mg/kg	0.361	--	1
Fluoranthene	ND		mg/kg	0.361	--	1
Pyrene	ND		mg/kg	0.361	--	1
Benzo(a)anthracene	ND		mg/kg	0.361	--	1
Chrysene	ND		mg/kg	0.361	--	1
Benzo(b)fluoranthene	ND		mg/kg	0.361	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.361	--	1
Benzo(a)pyrene	ND		mg/kg	0.361	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.361	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.361	--	1
Benzo(ghi)perylene	ND		mg/kg	0.361	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-19 RE	Date Collected:	08/11/11 07:20
Client ID:	SP-9	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**30**	Q	40-140
o-Terphenyl	**34**	Q	40-140
2-Fluorobiphenyl	83		40-140
2-Bromonaphthalene	82		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-20	Date Collected:	08/11/11 07:25
Client ID:	SP-10	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/19/11 14:50
Analytical Date:	08/22/11 21:30	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/20/11
Percent Solids:	86%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.64	--	1
C19-C36 Aliphatics	ND		mg/kg	7.64	--	1
C11-C22 Aromatics	23.0		mg/kg	7.64	--	1
C11-C22 Aromatics, Adjusted	18.3		mg/kg	7.64	--	1
Naphthalene	ND		mg/kg	0.382	--	1
2-Methylnaphthalene	ND		mg/kg	0.382	--	1
Acenaphthylene	ND		mg/kg	0.382	--	1
Acenaphthene	ND		mg/kg	0.382	--	1
Fluorene	ND		mg/kg	0.382	--	1
Phenanthrene	1.20		mg/kg	0.382	--	1
Anthracene	ND		mg/kg	0.382	--	1
Fluoranthene	1.22		mg/kg	0.382	--	1
Pyrene	0.978		mg/kg	0.382	--	1
Benzo(a)anthracene	0.475		mg/kg	0.382	--	1
Chrysene	0.460		mg/kg	0.382	--	1
Benzo(b)fluoranthene	ND		mg/kg	0.382	--	1
Benzo(k)fluoranthene	ND		mg/kg	0.382	--	1
Benzo(a)pyrene	0.447		mg/kg	0.382	--	1
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.382	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.382	--	1
Benzo(ghi)perylene	ND		mg/kg	0.382	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-20	Date Collected:	08/11/11 07:25
Client ID:	SP-10	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	81		40-140
o-Terphenyl	87		40-140
2-Fluorobiphenyl	83		40-140
2-Bromonaphthalene	80		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-21	Date Collected:	08/11/11 07:30
Client ID:	SP-11	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/17/11 16:22
Analytical Date:	08/18/11 20:55	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	10.1		mg/kg	7.76	--	1
C19-C36 Aliphatics	100		mg/kg	7.76	--	1
C11-C22 Aromatics	72.2		mg/kg	7.76	--	1
C11-C22 Aromatics, Adjusted	62.0		mg/kg	7.76	--	1
Naphthalene	ND		mg/kg	0.388	--	1
2-Methylnaphthalene	ND		mg/kg	0.388	--	1
Acenaphthylene	ND		mg/kg	0.388	--	1
Acenaphthene	ND		mg/kg	0.388	--	1
Fluorene	ND		mg/kg	0.388	--	1
Phenanthrene	1.44		mg/kg	0.388	--	1
Anthracene	ND		mg/kg	0.388	--	1
Fluoranthene	1.74		mg/kg	0.388	--	1
Pyrene	1.77		mg/kg	0.388	--	1
Benzo(a)anthracene	0.977		mg/kg	0.388	--	1
Chrysene	0.964		mg/kg	0.388	--	1
Benzo(b)fluoranthene	0.598		mg/kg	0.388	--	1
Benzo(k)fluoranthene	0.721		mg/kg	0.388	--	1
Benzo(a)pyrene	1.08		mg/kg	0.388	--	1
Indeno(1,2,3-cd)Pyrene	0.516		mg/kg	0.388	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.388	--	1
Benzo(ghi)perylene	0.464		mg/kg	0.388	--	1

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-21	Date Collected:	08/11/11 07:30
Client ID:	SP-11	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	88		40-140
o-Terphenyl	90		40-140
2-Fluorobiphenyl	70		40-140
2-Bromonaphthalene	76		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-22	Date Collected:	08/11/11 07:35
Client ID:	SP-12	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/17/11 16:22
Analytical Date:	08/18/11 21:40	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	82%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	8.16		mg/kg	8.02	--	1
C19-C36 Aliphatics	107		mg/kg	8.02	--	1
C11-C22 Aromatics	68.8		mg/kg	8.02	--	1
C11-C22 Aromatics, Adjusted	55.2		mg/kg	8.02	--	1
Naphthalene	ND		mg/kg	0.401	--	1
2-Methylnaphthalene	ND		mg/kg	0.401	--	1
Acenaphthylene	ND		mg/kg	0.401	--	1
Acenaphthene	ND		mg/kg	0.401	--	1
Fluorene	ND		mg/kg	0.401	--	1
Phenanthrene	1.77		mg/kg	0.401	--	1
Anthracene	0.497		mg/kg	0.401	--	1
Fluoranthene	2.31		mg/kg	0.401	--	1
Pyrene	2.18		mg/kg	0.401	--	1
Benzo(a)anthracene	1.17		mg/kg	0.401	--	1
Chrysene	1.13		mg/kg	0.401	--	1
Benzo(b)fluoranthene	0.886		mg/kg	0.401	--	1
Benzo(k)fluoranthene	0.962		mg/kg	0.401	--	1
Benzo(a)pyrene	1.42		mg/kg	0.401	--	1
Indeno(1,2,3-cd)Pyrene	0.702		mg/kg	0.401	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.401	--	1
Benzo(ghi)perylene	0.633		mg/kg	0.401	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-22	Date Collected:	08/11/11 07:35
Client ID:	SP-12	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	104		40-140
o-Terphenyl	93		40-140
2-Fluorobiphenyl	72		40-140
2-Bromonaphthalene	71		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-23	Date Collected:	08/11/11 07:40
Client ID:	SP-13	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/17/11 16:22
Analytical Date:	08/18/11 22:25	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	84%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.74	--	1
C19-C36 Aliphatics	108		mg/kg	7.74	--	1
C11-C22 Aromatics	104		mg/kg	7.74	--	1
C11-C22 Aromatics, Adjusted	91.3		mg/kg	7.74	--	1
Naphthalene	ND		mg/kg	0.387	--	1
2-Methylnaphthalene	ND		mg/kg	0.387	--	1
Acenaphthylene	ND		mg/kg	0.387	--	1
Acenaphthene	ND		mg/kg	0.387	--	1
Fluorene	ND		mg/kg	0.387	--	1
Phenanthrene	1.78		mg/kg	0.387	--	1
Anthracene	0.445		mg/kg	0.387	--	1
Fluoranthene	1.90		mg/kg	0.387	--	1
Pyrene	2.09		mg/kg	0.387	--	1
Benzo(a)anthracene	1.06		mg/kg	0.387	--	1
Chrysene	1.08		mg/kg	0.387	--	1
Benzo(b)fluoranthene	0.780		mg/kg	0.387	--	1
Benzo(k)fluoranthene	0.838		mg/kg	0.387	--	1
Benzo(a)pyrene	1.28		mg/kg	0.387	--	1
Indeno(1,2,3-cd)Pyrene	0.675		mg/kg	0.387	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.387	--	1
Benzo(ghi)perylene	0.680		mg/kg	0.387	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-23	Date Collected:	08/11/11 07:40
Client ID:	SP-13	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	98		40-140
o-Terphenyl	115		40-140
2-Fluorobiphenyl	83		40-140
2-Bromonaphthalene	82		40-140

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-24	Date Collected:	08/11/11 07:45
Client ID:	SP-14	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/17/11 16:22
Analytical Date:	08/22/11 19:57	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	86%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.74	--	1
C19-C36 Aliphatics	79.0		mg/kg	7.74	--	1
C11-C22 Aromatics	83.5		mg/kg	7.74	--	1
C11-C22 Aromatics, Adjusted	73.2		mg/kg	7.74	--	1
Naphthalene	ND		mg/kg	0.387	--	1
2-Methylnaphthalene	ND		mg/kg	0.387	--	1
Acenaphthylene	ND		mg/kg	0.387	--	1
Acenaphthene	ND		mg/kg	0.387	--	1
Fluorene	ND		mg/kg	0.387	--	1
Phenanthrene	1.39		mg/kg	0.387	--	1
Anthracene	ND		mg/kg	0.387	--	1
Fluoranthene	1.74		mg/kg	0.387	--	1
Pyrene	1.80		mg/kg	0.387	--	1
Benzo(a)anthracene	0.844		mg/kg	0.387	--	1
Chrysene	0.824		mg/kg	0.387	--	1
Benzo(b)fluoranthene	0.867		mg/kg	0.387	--	1
Benzo(k)fluoranthene	0.561		mg/kg	0.387	--	1
Benzo(a)pyrene	0.900		mg/kg	0.387	--	1
Indeno(1,2,3-cd)Pyrene	0.574		mg/kg	0.387	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.387	--	1
Benzo(ghi)perylene	0.813		mg/kg	0.387	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-24	Date Collected:	08/11/11 07:45
Client ID:	SP-14	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	118		40-140
o-Terphenyl	125		40-140
2-Fluorobiphenyl	97		40-140
2-Bromonaphthalene	103		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-25	Date Collected:	08/11/11 07:50
Client ID:	SP-15	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	08/17/11 16:22
Analytical Date:	08/22/11 19:25	Cleanup Method1:	EPH-04-1
Analyst:	NH	Cleanup Date1:	08/18/11
Percent Solids:	84%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.87	--	1
C19-C36 Aliphatics	141		mg/kg	7.87	--	1
C11-C22 Aromatics	101		mg/kg	7.87	--	1
C11-C22 Aromatics, Adjusted	88.0		mg/kg	7.87	--	1
Naphthalene	ND		mg/kg	0.394	--	1
2-Methylnaphthalene	ND		mg/kg	0.394	--	1
Acenaphthylene	ND		mg/kg	0.394	--	1
Acenaphthene	ND		mg/kg	0.394	--	1
Fluorene	ND		mg/kg	0.394	--	1
Phenanthrene	1.80		mg/kg	0.394	--	1
Anthracene	0.420		mg/kg	0.394	--	1
Fluoranthene	2.28		mg/kg	0.394	--	1
Pyrene	2.38		mg/kg	0.394	--	1
Benzo(a)anthracene	1.06		mg/kg	0.394	--	1
Chrysene	1.08		mg/kg	0.394	--	1
Benzo(b)fluoranthene	0.929		mg/kg	0.394	--	1
Benzo(k)fluoranthene	0.796		mg/kg	0.394	--	1
Benzo(a)pyrene	1.08		mg/kg	0.394	--	1
Indeno(1,2,3-cd)Pyrene	0.634		mg/kg	0.394	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.394	--	1
Benzo(ghi)perylene	0.934		mg/kg	0.394	--	1

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

SAMPLE RESULTS

Lab ID:	L1112235-25	Date Collected:	08/11/11 07:50
Client ID:	SP-15	Date Received:	08/11/11
Sample Location:	CHARLTON, MASSACHUSETTS	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**148**	Q	40-140
o-Terphenyl	133		40-140
2-Fluorobiphenyl	108		40-140
2-Bromonaphthalene	117		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 08/17/11 17:46
Analyst: NH

Extraction Method: EPA 3546
Extraction Date: 08/13/11 00:15
Cleanup Method1: EPH-04-1
Cleanup Date1: 08/17/11

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-13 Batch: WG484402-1					
C9-C18 Aliphatics	ND		mg/kg	6.66	--
C19-C36 Aliphatics	ND		mg/kg	6.66	--
C11-C22 Aromatics	ND		mg/kg	6.66	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.66	--
Naphthalene	ND		mg/kg	0.333	--
2-Methylnaphthalene	ND		mg/kg	0.333	--
Acenaphthylene	ND		mg/kg	0.333	--
Acenaphthene	ND		mg/kg	0.333	--
Fluorene	ND		mg/kg	0.333	--
Phenanthrene	ND		mg/kg	0.333	--
Anthracene	ND		mg/kg	0.333	--
Fluoranthene	ND		mg/kg	0.333	--
Pyrene	ND		mg/kg	0.333	--
Benzo(a)anthracene	ND		mg/kg	0.333	--
Chrysene	ND		mg/kg	0.333	--
Benzo(b)fluoranthene	ND		mg/kg	0.333	--
Benzo(k)fluoranthene	ND		mg/kg	0.333	--
Benzo(a)pyrene	ND		mg/kg	0.333	--
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.333	--
Dibenzo(a,h)anthracene	ND		mg/kg	0.333	--
Benzo(ghi)perylene	ND		mg/kg	0.333	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	58		40-140
o-Terphenyl	79		40-140
2-Fluorobiphenyl	77		40-140
2-Bromonaphthalene	75		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 08/18/11 16:18
Analyst: NH

Extraction Method: EPA 3546
Extraction Date: 08/15/11 13:16
Cleanup Method1: EPH-04-1
Cleanup Date1: 08/18/11

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 14 Batch: WG484569-1					
C9-C18 Aliphatics	ND		mg/kg	6.67	--
C19-C36 Aliphatics	ND		mg/kg	6.67	--
C11-C22 Aromatics	ND		mg/kg	6.67	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.67	--
Naphthalene	ND		mg/kg	0.333	--
2-Methylnaphthalene	ND		mg/kg	0.333	--
Acenaphthylene	ND		mg/kg	0.333	--
Acenaphthene	ND		mg/kg	0.333	--
Fluorene	ND		mg/kg	0.333	--
Phenanthrene	ND		mg/kg	0.333	--
Anthracene	ND		mg/kg	0.333	--
Fluoranthene	ND		mg/kg	0.333	--
Pyrene	ND		mg/kg	0.333	--
Benzo(a)anthracene	ND		mg/kg	0.333	--
Chrysene	ND		mg/kg	0.333	--
Benzo(b)fluoranthene	ND		mg/kg	0.333	--
Benzo(k)fluoranthene	ND		mg/kg	0.333	--
Benzo(a)pyrene	ND		mg/kg	0.333	--
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.333	--
Dibenzo(a,h)anthracene	ND		mg/kg	0.333	--
Benzo(ghi)perylene	ND		mg/kg	0.333	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	51		40-140
o-Terphenyl	61		40-140
2-Fluorobiphenyl	80		40-140
2-Bromonaphthalene	79		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 08/18/11 15:51
Analyst: NH

Extraction Method: EPA 3546
Extraction Date: 08/17/11 16:22
Cleanup Method1: EPH-04-1
Cleanup Date1: 08/18/11

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 21-25 Batch: WG485093-1					
C9-C18 Aliphatics	ND		mg/kg	6.62	--
C19-C36 Aliphatics	ND		mg/kg	6.62	--
C11-C22 Aromatics	ND		mg/kg	6.62	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.62	--
Naphthalene	ND		mg/kg	0.331	--
2-Methylnaphthalene	ND		mg/kg	0.331	--
Acenaphthylene	ND		mg/kg	0.331	--
Acenaphthene	ND		mg/kg	0.331	--
Fluorene	ND		mg/kg	0.331	--
Phenanthrene	ND		mg/kg	0.331	--
Anthracene	ND		mg/kg	0.331	--
Fluoranthene	ND		mg/kg	0.331	--
Pyrene	ND		mg/kg	0.331	--
Benzo(a)anthracene	ND		mg/kg	0.331	--
Chrysene	ND		mg/kg	0.331	--
Benzo(b)fluoranthene	ND		mg/kg	0.331	--
Benzo(k)fluoranthene	ND		mg/kg	0.331	--
Benzo(a)pyrene	ND		mg/kg	0.331	--
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.331	--
Dibenzo(a,h)anthracene	ND		mg/kg	0.331	--
Benzo(ghi)perylene	ND		mg/kg	0.331	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	74		40-140
o-Terphenyl	89		40-140
2-Fluorobiphenyl	77		40-140
2-Bromonaphthalene	85		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 08/21/11 16:13
Analyst: NH

Extraction Method: EPA 3546
Extraction Date: 08/19/11 14:50
Cleanup Method1: EPH-04-1
Cleanup Date1: 08/20/11

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 17,19-20 Batch: WG485524-1					
C9-C18 Aliphatics	ND		mg/kg	6.67	--
C19-C36 Aliphatics	ND		mg/kg	6.67	--
C11-C22 Aromatics	ND		mg/kg	6.67	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.67	--
Naphthalene	ND		mg/kg	0.333	--
2-Methylnaphthalene	ND		mg/kg	0.333	--
Acenaphthylene	ND		mg/kg	0.333	--
Acenaphthene	ND		mg/kg	0.333	--
Fluorene	ND		mg/kg	0.333	--
Phenanthrene	ND		mg/kg	0.333	--
Anthracene	ND		mg/kg	0.333	--
Fluoranthene	ND		mg/kg	0.333	--
Pyrene	ND		mg/kg	0.333	--
Benzo(a)anthracene	ND		mg/kg	0.333	--
Chrysene	ND		mg/kg	0.333	--
Benzo(b)fluoranthene	ND		mg/kg	0.333	--
Benzo(k)fluoranthene	ND		mg/kg	0.333	--
Benzo(a)pyrene	ND		mg/kg	0.333	--
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.333	--
Dibenzo(a,h)anthracene	ND		mg/kg	0.333	--
Benzo(ghi)perylene	ND		mg/kg	0.333	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	57		40-140
o-Terphenyl	85		40-140
2-Fluorobiphenyl	82		40-140
2-Bromonaphthalene	78		40-140

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 08/22/11 12:54
Analyst: NH

Extraction Method: EPA 3546
Extraction Date: 08/21/11 14:03
Cleanup Method1: EPH-04-1
Cleanup Date1: 08/22/11

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 15-16,18 Batch: WG485659-1					
C9-C18 Aliphatics	ND		mg/kg	6.62	--
C19-C36 Aliphatics	ND		mg/kg	6.62	--
C11-C22 Aromatics	ND		mg/kg	6.62	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.62	--
Naphthalene	ND		mg/kg	0.331	--
2-Methylnaphthalene	ND		mg/kg	0.331	--
Acenaphthylene	ND		mg/kg	0.331	--
Acenaphthene	ND		mg/kg	0.331	--
Fluorene	ND		mg/kg	0.331	--
Phenanthrene	ND		mg/kg	0.331	--
Anthracene	ND		mg/kg	0.331	--
Fluoranthene	ND		mg/kg	0.331	--
Pyrene	ND		mg/kg	0.331	--
Benzo(a)anthracene	ND		mg/kg	0.331	--
Chrysene	ND		mg/kg	0.331	--
Benzo(b)fluoranthene	ND		mg/kg	0.331	--
Benzo(k)fluoranthene	ND		mg/kg	0.331	--
Benzo(a)pyrene	ND		mg/kg	0.331	--
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.331	--
Dibenzo(a,h)anthracene	ND		mg/kg	0.331	--
Benzo(ghi)perylene	ND		mg/kg	0.331	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	51		40-140
o-Terphenyl	75		40-140
2-Fluorobiphenyl	69		40-140
2-Bromonaphthalene	71		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-13 Batch: WG484402-2 WG484402-3								
C9-C18 Aliphatics	51		67		40-140	**27**	Q	25
C19-C36 Aliphatics	63		84		40-140	**29**	Q	25
C11-C22 Aromatics	78		91		40-140	15		25
Naphthalene	57		73		40-140	25		25
2-Methylnaphthalene	65		81		40-140	22		25
Acenaphthylene	64		78		40-140	20		25
Acenaphthene	69		84		40-140	20		25
Fluorene	74		88		40-140	17		25
Phenanthrene	78		91		40-140	15		25
Anthracene	77		90		40-140	16		25
Fluoranthene	81		93		40-140	14		25
Pyrene	82		94		40-140	14		25
Benzo(a)anthracene	78		90		40-140	14		25
Chrysene	80		92		40-140	14		25
Benzo(b)fluoranthene	80		92		40-140	14		25
Benzo(k)fluoranthene	82		94		40-140	14		25
Benzo(a)pyrene	79		92		40-140	15		25
Indeno(1,2,3-cd)Pyrene	82		94		40-140	14		25
Dibenzo(a,h)anthracene	77		88		40-140	13		25
Benzo(ghi)perylene	79		91		40-140	14		25
Nonane (C9)	42		54		30-140	25		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-13 Batch: WG484402-2 WG484402-3								
Decane (C10)	48		64		40-140	**29**	Q	25
Dodecane (C12)	53		70		40-140	**28**	Q	25
Tetradecane (C14)	58		76		40-140	**27**	Q	25
Hexadecane (C16)	62		81		40-140	**27**	Q	25
Octadecane (C18)	64		85		40-140	**28**	Q	25
Nonadecane (C19)	64		86		40-140	**29**	Q	25
Eicosane (C20)	64		85		40-140	**28**	Q	25
Docosane (C22)	63		84		40-140	**29**	Q	25
Tetracosane (C24)	64		85		40-140	**28**	Q	25
Hexacosane (C26)	64		86		40-140	**29**	Q	25
Octacosane (C28)	64		85		40-140	**28**	Q	25
Triacontane (C30)	67		89		40-140	**28**	Q	25
Hexatriacontane (C36)	72		95		40-140	**28**	Q	25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	59		76		40-140
o-Terphenyl	83		86		40-140
2-Fluorobiphenyl	78		82		40-140
2-Bromonaphthalene	78		81		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 14 Batch: WG484569-2 WG484569-3								
C9-C18 Aliphatics	44		46		40-140	4		25
C19-C36 Aliphatics	57		54		40-140	5		25
C11-C22 Aromatics	68		65		40-140	5		25
Naphthalene	54		58		40-140	7		25
2-Methylnaphthalene	57		61		40-140	7		25
Acenaphthylene	54		58		40-140	7		25
Acenaphthene	56		60		40-140	7		25
Fluorene	57		58		40-140	2		25
Phenanthrene	62		61		40-140	2		25
Anthracene	63		61		40-140	3		25
Fluoranthene	66		62		40-140	6		25
Pyrene	69		66		40-140	4		25
Benzo(a)anthracene	65		61		40-140	6		25
Chrysene	65		61		40-140	6		25
Benzo(b)fluoranthene	66		63		40-140	5		25
Benzo(k)fluoranthene	66		62		40-140	6		25
Benzo(a)pyrene	68		65		40-140	5		25
Indeno(1,2,3-cd)Pyrene	66		63		40-140	5		25
Dibenzo(a,h)anthracene	63		60		40-140	5		25
Benzo(ghi)perylene	66		61		40-140	8		25
Nonane (C9)	38		40		30-140	5		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL

Project Number: 75398-72037

Lab Number: L1112235

Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 14 Batch: WG484569-2 WG484569-3								
Decane (C10)	41		43		40-140	5		25
Dodecane (C12)	44		46		40-140	4		25
Tetradecane (C14)	45		48		40-140	6		25
Hexadecane (C16)	50		50		40-140	0		25
Octadecane (C18)	56		54		40-140	4		25
Nonadecane (C19)	58		55		40-140	5		25
Eicosane (C20)	58		55		40-140	5		25
Docosane (C22)	58		54		40-140	7		25
Tetracosane (C24)	58		55		40-140	5		25
Hexacosane (C26)	59		55		40-140	7		25
Octacosane (C28)	58		55		40-140	5		25
Triacontane (C30)	61		58		40-140	5		25
Hexatriacontane (C36)	66		61		40-140	8		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	50		56		40-140
o-Terphenyl	64		66		40-140
2-Fluorobiphenyl	85		80		40-140
2-Bromonaphthalene	86		81		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 21-25 Batch: WG485093-2 WG485093-3								
C9-C18 Aliphatics	64		76		40-140	17		25
C19-C36 Aliphatics	76		91		40-140	18		25
C11-C22 Aromatics	105		111		40-140	6		25
Naphthalene	97		104		40-140	7		25
2-Methylnaphthalene	100		108		40-140	8		25
Acenaphthylene	96		106		40-140	10		25
Acenaphthene	95		104		40-140	9		25
Fluorene	93		97		40-140	4		25
Phenanthrene	97		104		40-140	7		25
Anthracene	97		105		40-140	8		25
Fluoranthene	95		101		40-140	6		25
Pyrene	98		107		40-140	9		25
Benzo(a)anthracene	94		101		40-140	7		25
Chrysene	95		102		40-140	7		25
Benzo(b)fluoranthene	102		108		40-140	6		25
Benzo(k)fluoranthene	90		98		40-140	9		25
Benzo(a)pyrene	99		107		40-140	8		25
Indeno(1,2,3-cd)Pyrene	98		106		40-140	8		25
Dibenzo(a,h)anthracene	95		103		40-140	8		25
Benzo(ghi)perylene	98		105		40-140	7		25
Nonane (C9)	57		68		30-140	18		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 21-25 Batch: WG485093-2 WG485093-3								
Decane (C10)	63		75		40-140	17		25
Dodecane (C12)	66		79		40-140	18		25
Tetradecane (C14)	68		80		40-140	16		25
Hexadecane (C16)	70		83		40-140	17		25
Octadecane (C18)	72		87		40-140	19		25
Nonadecane (C19)	73		88		40-140	19		25
Eicosane (C20)	74		89		40-140	18		25
Docosane (C22)	75		90		40-140	18		25
Tetracosane (C24)	76		92		40-140	19		25
Hexacosane (C26)	76		92		40-140	19		25
Octacosane (C28)	75		90		40-140	18		25
Triacontane (C30)	78		93		40-140	18		25
Hexatriacontane (C36)	83		100		40-140	19		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	68		81		40-140
o-Terphenyl	96		101		40-140
2-Fluorobiphenyl	81		90		40-140
2-Bromonaphthalene	89		93		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 17,19-20 Batch: WG485524-2 WG485524-3								
C9-C18 Aliphatics	56		62		40-140	10		25
C19-C36 Aliphatics	72		77		40-140	7		25
C11-C22 Aromatics	88		92		40-140	4		25
Naphthalene	74		79		40-140	7		25
2-Methylnaphthalene	79		85		40-140	7		25
Acenaphthylene	77		84		40-140	9		25
Acenaphthene	78		84		40-140	7		25
Fluorene	80		86		40-140	7		25
Phenanthrene	83		88		40-140	6		25
Anthracene	83		88		40-140	6		25
Fluoranthene	86		90		40-140	5		25
Pyrene	88		92		40-140	4		25
Benzo(a)anthracene	86		90		40-140	5		25
Chrysene	86		90		40-140	5		25
Benzo(b)fluoranthene	90		92		40-140	2		25
Benzo(k)fluoranthene	88		91		40-140	3		25
Benzo(a)pyrene	92		96		40-140	4		25
Indeno(1,2,3-cd)Pyrene	86		88		40-140	2		25
Dibenzo(a,h)anthracene	83		87		40-140	5		25
Benzo(ghi)perylene	79		86		40-140	8		25
Nonane (C9)	50		56		30-140	11		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 17,19-20 Batch: WG485524-2 WG485524-3								
Decane (C10)	56		62		40-140	10		25
Dodecane (C12)	58		64		40-140	10		25
Tetradecane (C14)	60		67		40-140	11		25
Hexadecane (C16)	65		72		40-140	10		25
Octadecane (C18)	70		76		40-140	8		25
Nonadecane (C19)	72		77		40-140	7		25
Eicosane (C20)	72		77		40-140	7		25
Docosane (C22)	72		77		40-140	7		25
Tetracosane (C24)	72		77		40-140	7		25
Hexacosane (C26)	73		78		40-140	7		25
Octacosane (C28)	73		78		40-140	7		25
Triacontane (C30)	77		82		40-140	6		25
Hexatriacontane (C36)	84		90		40-140	7		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	61		71		40-140
o-Terphenyl	83		84		40-140
2-Fluorobiphenyl	85		87		40-140
2-Bromonaphthalene	82		84		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 15-16,18 Batch: WG485659-2 WG485659-3								
C9-C18 Aliphatics	73		92		40-140	23		25
C19-C36 Aliphatics	77		92		40-140	18		25
C11-C22 Aromatics	89		78		40-140	13		25
Naphthalene	78		67		40-140	15		25
2-Methylnaphthalene	83		71		40-140	16		25
Acenaphthylene	81		69		40-140	16		25
Acenaphthene	81		69		40-140	16		25
Fluorene	78		68		40-140	14		25
Phenanthrene	83		72		40-140	14		25
Anthracene	84		71		40-140	17		25
Fluoranthene	80		70		40-140	13		25
Pyrene	84		71		40-140	17		25
Benzo(a)anthracene	74		66		40-140	11		25
Chrysene	77		68		40-140	12		25
Benzo(b)fluoranthene	74		68		40-140	8		25
Benzo(k)fluoranthene	74		67		40-140	10		25
Benzo(a)pyrene	74		65		40-140	13		25
Indeno(1,2,3-cd)Pyrene	66		60		40-140	10		25
Dibenzo(a,h)anthracene	62		57		40-140	8		25
Benzo(ghi)perylene	67		60		40-140	11		25
Nonane (C9)	58		66		30-140	13		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL

Project Number: 75398-72037

Lab Number: L1112235

Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 15-16,18 Batch: WG485659-2 WG485659-3								
Decane (C10)	63		71		40-140	12		25
Dodecane (C12)	66		75		40-140	13		25
Tetradecane (C14)	65		75		40-140	14		25
Hexadecane (C16)	70		80		40-140	13		25
Octadecane (C18)	70		80		40-140	13		25
Nonadecane (C19)	71		81		40-140	13		25
Eicosane (C20)	71		82		40-140	14		25
Docosane (C22)	75		81		40-140	8		25
Tetracosane (C24)	70		81		40-140	15		25
Hexacosane (C26)	70		78		40-140	11		25
Octacosane (C28)	69		79		40-140	14		25
Triacontane (C30)	70		80		40-140	13		25
Hexatriacontane (C36)	72		82		40-140	13		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	77		77		40-140
o-Terphenyl	84		72		40-140
2-Fluorobiphenyl	85		64		40-140
2-Bromonaphthalene	86		69		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

METALS

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-01
Client ID: SE-1
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 92%

Date Collected: 08/11/11 09:30
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.4		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:11	EPA 3050B	97,6010B	MG
Barium, Total	52		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:11	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:11	EPA 3050B	97,6010B	MG
Chromium, Total	18		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:11	EPA 3050B	97,6010B	MG
Lead, Total	64		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:11	EPA 3050B	97,6010B	MG
Mercury, Total	0.20		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:13	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:11	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:11	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-02
Client ID: SE-2
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 90%

Date Collected: 08/11/11 09:45
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	5.4		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:17	EPA 3050B	97,6010B	MG
Barium, Total	61		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:17	EPA 3050B	97,6010B	MG
Cadmium, Total	0.65		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:17	EPA 3050B	97,6010B	MG
Chromium, Total	20		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:17	EPA 3050B	97,6010B	MG
Lead, Total	71		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:17	EPA 3050B	97,6010B	MG
Mercury, Total	0.24		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:15	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:17	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:17	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-03
Client ID: SE-3
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 89%

Date Collected: 08/11/11 10:00
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	3.9		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:20	EPA 3050B	97,6010B	MG
Barium, Total	89		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:20	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:20	EPA 3050B	97,6010B	MG
Chromium, Total	19		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:20	EPA 3050B	97,6010B	MG
Lead, Total	48		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:20	EPA 3050B	97,6010B	MG
Mercury, Total	ND		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:16	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:20	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:20	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-04
Client ID: SE-4
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 93%

Date Collected: 08/11/11 10:15
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	5.2		mg/kg	0.38	--	1	08/16/11 09:15	08/16/11 22:24	EPA 3050B	97,6010B	MG
Barium, Total	48		mg/kg	0.38	--	1	08/16/11 09:15	08/16/11 22:24	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.38	--	1	08/16/11 09:15	08/16/11 22:24	EPA 3050B	97,6010B	MG
Chromium, Total	17		mg/kg	0.38	--	1	08/16/11 09:15	08/16/11 22:24	EPA 3050B	97,6010B	MG
Lead, Total	19		mg/kg	1.9	--	1	08/16/11 09:15	08/16/11 22:24	EPA 3050B	97,6010B	MG
Mercury, Total	ND		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 11:18	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	1.9	--	1	08/16/11 09:15	08/16/11 22:24	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.38	--	1	08/16/11 09:15	08/16/11 22:24	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-05
Client ID: SE-5
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 90%

Date Collected: 08/11/11 10:30
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	3.9		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 22:27	EPA 3050B	97,6010B	MG
Barium, Total	36		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 22:27	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 22:27	EPA 3050B	97,6010B	MG
Chromium, Total	14		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 22:27	EPA 3050B	97,6010B	MG
Lead, Total	56		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:27	EPA 3050B	97,6010B	MG
Mercury, Total	0.10		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:20	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:27	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 22:27	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-06
Client ID: PR-1
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 89%

Date Collected: 08/11/11 08:00
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.2		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:30	EPA 3050B	97,6010B	MG
Barium, Total	46		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:30	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:30	EPA 3050B	97,6010B	MG
Chromium, Total	16		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:30	EPA 3050B	97,6010B	MG
Lead, Total	100		mg/kg	1.9	--	1	08/16/11 09:15	08/16/11 22:30	EPA 3050B	97,6010B	MG
Mercury, Total	0.26		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:22	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	1.9	--	1	08/16/11 09:15	08/16/11 22:30	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:30	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-07
Client ID: PR-2
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 92%

Date Collected: 08/11/11 08:20
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.5		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 22:34	EPA 3050B	97,6010B	MG
Barium, Total	55		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 22:34	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 22:34	EPA 3050B	97,6010B	MG
Chromium, Total	17		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 22:34	EPA 3050B	97,6010B	MG
Lead, Total	66		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:34	EPA 3050B	97,6010B	MG
Mercury, Total	0.21		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:24	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:34	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 22:34	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-08
Client ID: PR-3
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 92%

Date Collected: 08/11/11 08:35
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	7.3		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:37	EPA 3050B	97,6010B	MG
Barium, Total	63		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:37	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:37	EPA 3050B	97,6010B	MG
Chromium, Total	19		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:37	EPA 3050B	97,6010B	MG
Lead, Total	140		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:37	EPA 3050B	97,6010B	MG
Mercury, Total	0.31		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 11:29	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:37	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:37	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-09
Client ID: PR-4
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 91%

Date Collected: 08/11/11 08:55
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	4.9		mg/kg	0.42	--	1	08/16/11 09:15	08/16/11 22:40	EPA 3050B	97,6010B	MG
Barium, Total	60		mg/kg	0.42	--	1	08/16/11 09:15	08/16/11 22:40	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.42	--	1	08/16/11 09:15	08/16/11 22:40	EPA 3050B	97,6010B	MG
Chromium, Total	17		mg/kg	0.42	--	1	08/16/11 09:15	08/16/11 22:40	EPA 3050B	97,6010B	MG
Lead, Total	100		mg/kg	2.1	--	1	08/16/11 09:15	08/16/11 22:40	EPA 3050B	97,6010B	MG
Mercury, Total	0.37		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 11:31	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.1	--	1	08/16/11 09:15	08/16/11 22:40	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.42	--	1	08/16/11 09:15	08/16/11 22:40	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-10
Client ID: PR-5
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 91%

Date Collected: 08/11/11 09:10
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	11		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:50	EPA 3050B	97,6010B	MG
Barium, Total	57		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:50	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:50	EPA 3050B	97,6010B	MG
Chromium, Total	23		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:50	EPA 3050B	97,6010B	MG
Lead, Total	66		mg/kg	1.9	--	1	08/16/11 09:15	08/16/11 22:50	EPA 3050B	97,6010B	MG
Mercury, Total	0.18		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:32	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	1.9	--	1	08/16/11 09:15	08/16/11 22:50	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.39	--	1	08/16/11 09:15	08/16/11 22:50	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-11
Client ID: SP-1
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 88%

Date Collected: 08/11/11 06:40
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	5.5		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:54	EPA 3050B	97,6010B	MG
Barium, Total	60		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:54	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:54	EPA 3050B	97,6010B	MG
Chromium, Total	36		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:54	EPA 3050B	97,6010B	MG
Lead, Total	18		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:54	EPA 3050B	97,6010B	MG
Mercury, Total	ND		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 11:34	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 22:54	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.41	--	1	08/16/11 09:15	08/16/11 22:54	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-12
Client ID: SP-2
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 86%

Date Collected: 08/11/11 06:45
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	7.5		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 22:57	EPA 3050B	97,6010B	MG
Barium, Total	68		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 22:57	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 22:57	EPA 3050B	97,6010B	MG
Chromium, Total	38		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 22:57	EPA 3050B	97,6010B	MG
Lead, Total	52		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 22:57	EPA 3050B	97,6010B	MG
Mercury, Total	0.16		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:36	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 22:57	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 22:57	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-13
Client ID: SP-3
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 86%

Date Collected: 08/11/11 06:50
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	7.1		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:00	EPA 3050B	97,6010B	MG
Barium, Total	76		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:00	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:00	EPA 3050B	97,6010B	MG
Chromium, Total	32		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:00	EPA 3050B	97,6010B	MG
Lead, Total	67		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:00	EPA 3050B	97,6010B	MG
Mercury, Total	0.16		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:38	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:00	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:00	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-14
Client ID: SP-4
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 85%

Date Collected: 08/11/11 06:55
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.7		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:04	EPA 3050B	97,6010B	MG
Barium, Total	72		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:04	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:04	EPA 3050B	97,6010B	MG
Chromium, Total	33		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:04	EPA 3050B	97,6010B	MG
Lead, Total	75		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:04	EPA 3050B	97,6010B	MG
Mercury, Total	0.23		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 11:39	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:04	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:04	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-15
Client ID: SP-5
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 85%

Date Collected: 08/11/11 07:00
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.9		mg/kg	0.45	--	1	08/16/11 09:15	08/16/11 23:07	EPA 3050B	97,6010B	MG
Barium, Total	76		mg/kg	0.45	--	1	08/16/11 09:15	08/16/11 23:07	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.45	--	1	08/16/11 09:15	08/16/11 23:07	EPA 3050B	97,6010B	MG
Chromium, Total	35		mg/kg	0.45	--	1	08/16/11 09:15	08/16/11 23:07	EPA 3050B	97,6010B	MG
Lead, Total	90		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:07	EPA 3050B	97,6010B	MG
Mercury, Total	0.18		mg/kg	0.10	--	1	08/16/11 19:00	08/17/11 11:41	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:07	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.45	--	1	08/16/11 09:15	08/16/11 23:07	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-16
Client ID: SP-6
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 85%

Date Collected: 08/11/11 07:05
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.3		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 23:10	EPA 3050B	97,6010B	MG
Barium, Total	73		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 23:10	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 23:10	EPA 3050B	97,6010B	MG
Chromium, Total	33		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 23:10	EPA 3050B	97,6010B	MG
Lead, Total	82		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:10	EPA 3050B	97,6010B	MG
Mercury, Total	0.28		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:43	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:10	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 23:10	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-17
Client ID: SP-7
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 84%

Date Collected: 08/11/11 07:10
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.3		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 23:13	EPA 3050B	97,6010B	MG
Barium, Total	86		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 23:13	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 23:13	EPA 3050B	97,6010B	MG
Chromium, Total	43		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 23:13	EPA 3050B	97,6010B	MG
Lead, Total	32		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:13	EPA 3050B	97,6010B	MG
Mercury, Total	0.08		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 11:45	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:13	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.43	--	1	08/16/11 09:15	08/16/11 23:13	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-18
Client ID: SP-8
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 85%

Date Collected: 08/11/11 07:15
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	7.9		mg/kg	0.45	--	1	08/16/11 09:15	08/16/11 23:17	EPA 3050B	97,6010B	MG
Barium, Total	140		mg/kg	0.45	--	1	08/16/11 09:15	08/16/11 23:17	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.45	--	1	08/16/11 09:15	08/16/11 23:17	EPA 3050B	97,6010B	MG
Chromium, Total	50		mg/kg	0.45	--	1	08/16/11 09:15	08/16/11 23:17	EPA 3050B	97,6010B	MG
Lead, Total	52		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:17	EPA 3050B	97,6010B	MG
Mercury, Total	0.24		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 11:50	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:17	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.45	--	1	08/16/11 09:15	08/16/11 23:17	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-19
Client ID: SP-9
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 85%

Date Collected: 08/11/11 07:20
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	12		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:20	EPA 3050B	97,6010B	MG
Barium, Total	67		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:20	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:20	EPA 3050B	97,6010B	MG
Chromium, Total	35		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:20	EPA 3050B	97,6010B	MG
Lead, Total	56		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:20	EPA 3050B	97,6010B	MG
Mercury, Total	0.20		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 11:52	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:15	08/16/11 23:20	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.44	--	1	08/16/11 09:15	08/16/11 23:20	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-20
Client ID: SP-10
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 86%

Date Collected: 08/11/11 07:25
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	7.0		mg/kg	0.42	--	1	08/16/11 09:15	08/16/11 23:30	EPA 3050B	97,6010B	MG
Barium, Total	68		mg/kg	0.42	--	1	08/16/11 09:15	08/16/11 23:30	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.42	--	1	08/16/11 09:15	08/16/11 23:30	EPA 3050B	97,6010B	MG
Chromium, Total	36		mg/kg	0.42	--	1	08/16/11 09:15	08/16/11 23:30	EPA 3050B	97,6010B	MG
Lead, Total	40		mg/kg	2.1	--	1	08/16/11 09:15	08/16/11 23:30	EPA 3050B	97,6010B	MG
Mercury, Total	0.10		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 11:54	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.1	--	1	08/16/11 09:15	08/16/11 23:30	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.42	--	1	08/16/11 09:15	08/16/11 23:30	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-21
Client ID: SP-11
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 85%

Date Collected: 08/11/11 07:30
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.7		mg/kg	0.43	--	1	08/16/11 09:18	08/16/11 23:47	EPA 3050B	97,6010B	MG
Barium, Total	61		mg/kg	0.43	--	1	08/16/11 09:18	08/16/11 23:47	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.43	--	1	08/16/11 09:18	08/16/11 23:47	EPA 3050B	97,6010B	MG
Chromium, Total	24		mg/kg	0.43	--	1	08/16/11 09:18	08/16/11 23:47	EPA 3050B	97,6010B	MG
Lead, Total	110		mg/kg	2.2	--	1	08/16/11 09:18	08/16/11 23:47	EPA 3050B	97,6010B	MG
Mercury, Total	0.76		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 12:01	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:18	08/16/11 23:47	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.43	--	1	08/16/11 09:18	08/16/11 23:47	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-22
Client ID: SP-12
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 82%

Date Collected: 08/11/11 07:35
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	7.4		mg/kg	0.45	--	1	08/16/11 09:18	08/16/11 23:53	EPA 3050B	97,6010B	MG
Barium, Total	66		mg/kg	0.45	--	1	08/16/11 09:18	08/16/11 23:53	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.45	--	1	08/16/11 09:18	08/16/11 23:53	EPA 3050B	97,6010B	MG
Chromium, Total	25		mg/kg	0.45	--	1	08/16/11 09:18	08/16/11 23:53	EPA 3050B	97,6010B	MG
Lead, Total	120		mg/kg	2.2	--	1	08/16/11 09:18	08/16/11 23:53	EPA 3050B	97,6010B	MG
Mercury, Total	0.50		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 12:03	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:18	08/16/11 23:53	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.45	--	1	08/16/11 09:18	08/16/11 23:53	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-23
Client ID: SP-13
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 84%

Date Collected: 08/11/11 07:40
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.2		mg/kg	0.42	--	1	08/16/11 09:18	08/16/11 23:57	EPA 3050B	97,6010B	MG
Barium, Total	57		mg/kg	0.42	--	1	08/16/11 09:18	08/16/11 23:57	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.42	--	1	08/16/11 09:18	08/16/11 23:57	EPA 3050B	97,6010B	MG
Chromium, Total	26		mg/kg	0.42	--	1	08/16/11 09:18	08/16/11 23:57	EPA 3050B	97,6010B	MG
Lead, Total	130		mg/kg	2.1	--	1	08/16/11 09:18	08/16/11 23:57	EPA 3050B	97,6010B	MG
Mercury, Total	0.48		mg/kg	0.10	--	1	08/16/11 19:00	08/17/11 12:05	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.1	--	1	08/16/11 09:18	08/16/11 23:57	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.42	--	1	08/16/11 09:18	08/16/11 23:57	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-24
Client ID: SP-14
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 86%

Date Collected: 08/11/11 07:45
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.2		mg/kg	0.41	--	1	08/16/11 09:18	08/17/11 00:00	EPA 3050B	97,6010B	MG
Barium, Total	54		mg/kg	0.41	--	1	08/16/11 09:18	08/17/11 00:00	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.41	--	1	08/16/11 09:18	08/17/11 00:00	EPA 3050B	97,6010B	MG
Chromium, Total	22		mg/kg	0.41	--	1	08/16/11 09:18	08/17/11 00:00	EPA 3050B	97,6010B	MG
Lead, Total	140		mg/kg	2.0	--	1	08/16/11 09:18	08/17/11 00:00	EPA 3050B	97,6010B	MG
Mercury, Total	0.42		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 12:06	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.0	--	1	08/16/11 09:18	08/17/11 00:00	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.41	--	1	08/16/11 09:18	08/17/11 00:00	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL
Lab Number: L1112235
Project Number: 75398-72037
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-25
Client ID: SP-15
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Percent Solids: 84%

Date Collected: 08/11/11 07:50
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.6		mg/kg	0.44	--	1	08/16/11 09:18	08/17/11 00:10	EPA 3050B	97,6010B	MG
Barium, Total	52		mg/kg	0.44	--	1	08/16/11 09:18	08/17/11 00:10	EPA 3050B	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.44	--	1	08/16/11 09:18	08/17/11 00:10	EPA 3050B	97,6010B	MG
Chromium, Total	21		mg/kg	0.44	--	1	08/16/11 09:18	08/17/11 00:10	EPA 3050B	97,6010B	MG
Lead, Total	130		mg/kg	2.2	--	1	08/16/11 09:18	08/17/11 00:10	EPA 3050B	97,6010B	MG
Mercury, Total	0.46		mg/kg	0.09	--	1	08/16/11 19:00	08/17/11 12:12	EPA 7471A	97,7471A	AH
Selenium, Total	ND		mg/kg	2.2	--	1	08/16/11 09:18	08/17/11 00:10	EPA 3050B	97,6010B	MG
Silver, Total	ND		mg/kg	0.44	--	1	08/16/11 09:18	08/17/11 00:10	EPA 3050B	97,6010B	MG

Project Name: CHARLTON LANDFILL **Lab Number:** L1112235

Project Number: 75398-72037 **Report Date:** 08/23/11

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-20 Batch: WG484837-1										
Arsenic, Total	ND		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 21:51	97,6010B	MG
Barium, Total	ND		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 21:51	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 21:51	97,6010B	MG
Chromium, Total	ND		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 21:51	97,6010B	MG
Lead, Total	ND		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 21:51	97,6010B	MG
Selenium, Total	ND		mg/kg	2.0	--	1	08/16/11 09:15	08/16/11 21:51	97,6010B	MG
Silver, Total	ND		mg/kg	0.40	--	1	08/16/11 09:15	08/16/11 21:51	97,6010B	MG

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 21-25 Batch: WG484841-1										
Arsenic, Total	ND		mg/kg	0.40	--	1	08/16/11 09:18	08/16/11 23:33	97,6010B	MG
Barium, Total	ND		mg/kg	0.40	--	1	08/16/11 09:18	08/16/11 23:33	97,6010B	MG
Cadmium, Total	ND		mg/kg	0.40	--	1	08/16/11 09:18	08/16/11 23:33	97,6010B	MG
Chromium, Total	ND		mg/kg	0.40	--	1	08/16/11 09:18	08/16/11 23:33	97,6010B	MG
Lead, Total	ND		mg/kg	2.0	--	1	08/16/11 09:18	08/16/11 23:33	97,6010B	MG
Selenium, Total	ND		mg/kg	2.0	--	1	08/16/11 09:18	08/16/11 23:33	97,6010B	MG
Silver, Total	ND		mg/kg	0.40	--	1	08/16/11 09:18	08/16/11 23:33	97,6010B	MG

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-20 Batch: WG484989-1										
Mercury, Total	ND		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 11:08	97,7471A	AH

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

Method Blank Analysis
Batch Quality Control

Prep Information

Digestion Method: EPA 7471A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 21-25 Batch: WG484990-1										
Mercury, Total	ND		mg/kg	0.08	--	1	08/16/11 19:00	08/17/11 11:56	97,7471A	AH

Prep Information

Digestion Method: EPA 7471A

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL

Project Number: 75398-72037

Lab Number: L1112235

Report Date: 08/23/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Westborough Lab Associated sample(s): 01-20 Batch: WG484837-2 WG484837-3 SRM Lot Number: 0518-10-02								
Arsenic, Total	100		93		81-119	7		30
Barium, Total	108		94		83-118	14		30
Cadmium, Total	102		91		82-117	11		30
Chromium, Total	101		92		80-119	9		30
Lead, Total	100		88		80-120	13		30
Selenium, Total	102		94		80-120	8		30
Silver, Total	105		96		66-134	9		30
MCP Total Metals - Westborough Lab Associated sample(s): 21-25 Batch: WG484841-2 WG484841-3 SRM Lot Number: 0518-10-02								
Arsenic, Total	100		100		81-119	0		30
Barium, Total	104		108		83-118	4		30
Cadmium, Total	98		102		82-117	4		30
Chromium, Total	101		101		80-119	0		30
Lead, Total	95		98		80-120	3		30
Selenium, Total	98		98		80-120	0		30
Silver, Total	102		104		66-134	2		30
MCP Total Metals - Westborough Lab Associated sample(s): 01-20 Batch: WG484989-2 WG484989-3 SRM Lot Number: 0518-10-02								
Mercury, Total	92		92		67-133	0		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
MCP Total Metals - Westborough Lab Associated sample(s): 21-25 Batch: WG484990-2 WG484990-3 SRM Lot Number: 0518-10-02					
Mercury, Total	114	111	67-133	3	30

INORGANICS
&
MISCELLANEOUS

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-01
Client ID: SE-1
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil

Date Collected: 08/11/11 09:30
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	92		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-02
Client ID: SE-2
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 09:45
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-03
Client ID: SE-3
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 10:00
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	89		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-04
Client ID: SE-4
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 10:15
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	93		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-05
Client ID: SE-5
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 10:30
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-06
Client ID: PR-1
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 08:00
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	89		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-07
Client ID: PR-2
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 08:20
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	92		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-08
Client ID: PR-3
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 08:35
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	92		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-09
Client ID: PR-4
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 08:55
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	91		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-10
Client ID: PR-5
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 09:10
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	91		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-11
Client ID: SP-1
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 06:40
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-12
Client ID: SP-2
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 06:45
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-13
Client ID: SP-3
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 06:50
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-14
Client ID: SP-4
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 06:55
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-15
Client ID: SP-5
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 07:00
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-16
Client ID: SP-6
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 07:05
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-17
Client ID: SP-7
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 07:10
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-18
Client ID: SP-8
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 07:15
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-19
Client ID: SP-9
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 07:20
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-20
Client ID: SP-10
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 07:25
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86		%	0.10	NA	1	-	08/12/11 00:21	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-21
Client ID: SP-11
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 07:30
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85		%	0.10	NA	1	-	08/12/11 00:54	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-22
Client ID: SP-12
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 07:35
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	82		%	0.10	NA	1	-	08/12/11 00:54	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-23
Client ID: SP-13
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil

Date Collected: 08/11/11 07:40
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84		%	0.10	NA	1	-	08/12/11 00:54	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-24
Client ID: SP-14
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 07:45
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86		%	0.10	NA	1	-	08/12/11 00:54	30,2540G	RD

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037
Lab Number: L1112235
Report Date: 08/23/11

SAMPLE RESULTS

Lab ID: L1112235-25
Client ID: SP-15
Sample Location: CHARLTON, MASSACHUSETTS
Matrix: Soil
Date Collected: 08/11/11 07:50
Date Received: 08/11/11
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84		%	0.10	NA	1	-	08/12/11 00:54	30,2540G	RD

Lab Duplicate Analysis
Batch Quality Control

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-20 QC Batch ID: WG484191-1 QC Sample: L1112235-01 Client ID: SE-1						
Solids, Total	92	92	%	0		20
General Chemistry - Westborough Lab Associated sample(s): 21-25 QC Batch ID: WG484193-1 QC Sample: L1112228-04 Client ID: DUP Sample						
Solids, Total	81	81	%	0		20

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1112235-01A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-02A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-03A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-04A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-05A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1112235-06A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-07A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-08A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-09A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-10A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-11A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-12A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1112235-13A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-14A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-15A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-16A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-17A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-18A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-19A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name: CHARLTON LANDFILL
Project Number: 75398-72037

Lab Number: L1112235
Report Date: 08/23/11

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1112235-20A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-21A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-22A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-23A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-24A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)
L1112235-25A	Amber 250ml unpreserved	A	N/A	2	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),EPH-DELUX-10(14),MCP-PB-6010T-10(180)

Container Comments

L1112235-18A

*Values in parentheses indicate holding time in days

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L1112235
Project Number:	75398-72037	**Report Date:**	08/23/11

GLOSSARY

Acronyms

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NI - Not Ignitable.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank.

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The RPD between the results for the two columns exceeds the method-specified criteria; however, the lower value has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less

Report Format: Data Usability Report

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L1112235
Project Number:	75398-72037	**Report Date:**	08/23/11

Data Qualifiers

than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	CHARLTON LANDFILL	**Lab Number:**	L1112235
Project Number:	75398-72037	**Report Date:**	08/23/11

REFERENCES

30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, July 2010.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certificate/Approval Program Summary

Last revised July 28, 2011 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. ***NELAP Accredited Solid Waste/Soil.***

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP), Ethylene Dibromide (EDB), 1,4-Dioxane (Mod 8270). Microbiology Parameters: Total Coliform-MF mEndo (SM9222B), Total Coliform – Colilert (SM9223 P/A), E. Coli. – Colilert (SM9223 P/A), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D))

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, TPH (HEM/SGT), Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH. Microbiology Parameters: Total Coliform – MF mEndo (SM9222B), Total Coliform – MTF (SM9221B), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform – A-1 Broth (SM9221E).)

Solid Waste/Soil (Inorganic Parameters: pH, Sulfide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), SPLP Leach (1312 metals only), Reactivity. Organic Parameters: PCBs, PCBs in Oil, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dicamba, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Volatile Organics, Acid Extractables (Phenols), 3.3'-Dichlorobenzidine, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Maine Department of Human Services Certificate/Lab ID: 2009024.
Drinking Water (Inorganic Parameters: SM9215B, 9222D, 9223B, EPA 180.1, 353.2, SM2130B, 2320B, 2540C, 4500Cl-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H+B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1, EPA 300.0. Organic Parameters: 504.1, 524.2.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, SM2320B, 2510B, 2540C, 2540D, 426C, 4500Cl-D, 4500Cl-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NH3-H, 4500NO3-F, 4500P-B, 4500P-E, 5210B, 5220D, 5310C, 9010B, 9040B, 9030B, 7470A, 7196A, 2340B, EPA 200.7, 6010, 200.8, 6020, 245.1, 1311, 1312, 3005A, Enterolert, 9223D, 9222D. Organic Parameters: 608, 8081, 8082, 8330, 8151A, 624, 8260, 3510C, 3630C, 5030B, ME-DRO, ME-GRO, MA-EPH, MA-VPH.)

Solid Waste/Soil (Inorganic Parameters: 9010B, 9012A, 9014A, 9040B, 9045C, 6010B, 7471A, 7196A, 9050A, 1010, 1030, 9065, 1311, 1312, 3005A, 3050B. Organic Parameters: ME-DRO, ME-GRO, MA-EPH, MA-VPH, 8260B, 8270C, 8330, 8151A, 8081A, 8082, 3540C, 3546, 3580A, 3630C, 5030B, 5035.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.
*Drinking Water (*Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl) (EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate); (EPA 353.2 for: Nitrate-N, Nitrite-N); (SM4500NO3-F for: Nitrate-N and Nitrite-N); 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, 2320B, SM2540C, SM4500H-B. Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics); (504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), EPA 332. Microbiology Parameters: SM9215B; ENZ. SUB. SM9223; ColilertQT SM9223B; MF-SM9222D.)

*Non-Potable Water (*Inorganic Parameters:, (EPA 200.8 for: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn); (EPA 200.7 for: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl, V,Zn); 245.1, SM4500H,B, EPA 120.1,

SM2510B, 2540C, 2340B, 2320B, 4500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia-N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Nitrate-N, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 5310C, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.
Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics),(608 for: Chlordane, Aldrin, Dieldrin, DDD, DDE, DDT, Heptachlor, Heptachlor Epoxide, PCBs-Water), (EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables), 600/4-81-045-PCB-Oil. Microbiology Parameters: (ColilertQT SM9223B;Enterolert-QT: SM9222D-MF.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM 9222B, 9223B, 9215B, EPA 200.7, 200.8, 245.2, 300.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 332.0. Organic Parameters: 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 3005A, 200.7, 200.8, 245.1, 245.2, SW-846 6010B, 6020, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 351.1, 353.2, 410.4, 420.1, 1664A, SW-846 9010, 9030, 9040B, 9050A, SM426C, SM2120B, 2310B, 2320B, 2540B, 2540D, 4500H+B, 4500CL-E, 4500CN-E, 4500NH3-H, 4500NO3-F, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 5220D, 2510B, 2540C, 4500F-C, 5310C, 5540C, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D. Organic Parameters: SW-846 3510C, 5030B, 8260B, 8270C, 8330, EPA 624, 625, 608, SW-846 8082, 8081A, 8151A.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 7196A, 7471A, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040B, 9045C, 9050C, 9065,1311, 1312, 3005A, 3050B. Organic Parameters: SW-846 3540C, 3546, 3580A, 5030B, 5035, 8260B, 8270C, 8330, 8151A, 8015B, 8082, 8081A.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9223B, 9215B, 4500CN-CE, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 200.8, 245.2, 2540C, SM2120B, 2320B, 2510B, 5310C, SM4500H-B. Organic Parameters: EPA 332, 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500Cl-E, EPA 300.0, SM2120B, SM4500F-BC, EPA 200.7, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM510ABC, SM4500P-B5+E, 2540B, 2540C, 2540D, EPA 120.1, SM2510B, SM15 426C, 9222D, 9221B, 9221C, 9221E, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, 350.2, SW-846 1312, 6020, 6020A, 7470A, 5540C, 4500H-B, EPA 200.8, SM3500Cr-D, 4500CN-CE, EPA 245.1, 245.2, SW-846 9040B, 3005A, 3015, EPA 6010B, 6010C, 7196A, 3060A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3510C, EPA 608, 624, 625, SW-846 3630C, 5030B, 8081A, 8081B, 8082, 8082A, 8151A, 8330, NJ OQA-QAM-025 Rev.7, NJ EPH.)

Solid & Chemical Materials (Inorganic Parameters: SW-846, 6010B, 6010C, 7196A, 3060A, 9010B, 9030B, 1010, 1030, 1311, 1312, 3005A, 3050B, 7471A, 7471B, 9014, 9012A, 9040B, 9045C, 9050A, 9065. Organic Parameters: SW-846 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3540C, 3545, 3546, 3550B, 3580A, 3630C, 5030B, 5035L, 5035H, NJ OQA-QAM-025 Rev.7, NJ EPH.)

New York Department of Health Certificate/Lab ID: 11148. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200.7, 245.2, SM5310C, EPA 332.0, SM2320B, EPA 300.0, SM2120B, 4500CN-E, 4500F-C, 4500H-B, 4500NO3-F, 2540C, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222B, 9215B, 5210B, 5310C, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, SM4500CL-E, 4500F-C, SM15 426C, EPA 350.1, SM4500NH3-BH, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, LACHAT 10-107-04-1-C, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6020, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, LACHAT 10-204-00-1-A, EPA 9040B, SM4500-HB, EPA 1664A, EPA 420.1, SM14 510C, EPA 120.1, SM2510B, SM4500S-D, SM5540C, EPA 3005A, 9010B, 9030B.. Organic Parameters: EPA 624, 8260B, 8270C, 625, 608, 8081A, 8151A, 8330, 8082, EPA 3510C, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: 1010, 1030, EPA 6010B, 7196A, 7471A, 9012A, 9014, 9040B, 9045C, 9065, 9050, EPA 1311, 1312, 3005A, 3050B, 9010B, 9030B. Organic Parameters: EPA 8260B, 8270C, 8015B, 8081A, 8151A, 8330, 8082, 3540C, 3545, 3546, 3580, 5030B, 5035.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. Organic Parameters: MA-EPH, MA-VPH.

Drinking Water Program Certificate/Lab ID: 25700. (Inorganic Parameters: Chloride EPA 300.0. Organic Parameters: 524.2)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. ***NELAP Accredited.***
Drinking Water (Organic Parameters: EPA 524.2, 504.1)

Non-Potable Water (Inorganic Parameters: EPA 1312, 200.7, 410.4, 1664A, SM2540D, 5210B, 5220D, 4500-P,BE. Organic Parameters: EPA 3510C, 5030B, 625, 624, 608, 8081A, 8082, 8151A, 8260B, 8270C, 8330)

Solid & Hazardous Waste (Inorganic Parameters: EPA 350.1, 1010, 1030, 1311, 1312, 3050B, 6010B, 7196A, 7471A, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065, SM 4500NH3-H. Organic Parameters: 3540C, 3545, 3546, 3550B**,** 3580A, 3630C, 5035, 8015B, 8081A, 8082, 8151A, 8260B, 8270C, 8330)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. ***NELAP Accredited via NY-DOH.***
Refer to MA-DEP Certificate for Potable and Non-Potable Water.
Refer to NJ-DEP Certificate for Potable and Non-Potable Water.

Texas Commisson on Environmental Quality Certificate/Lab ID: T104704476-09-1. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664, 200.7, 200.8, 245.1, 245.2, 300.0, 350.1, 351.1, 353.2, 376.2, 410.4, 420.1, 6010, 6020, 7196, 7470, 9040, SM 2120B, 2310B, 2320B, 2510B, 2540B, 2540C, 2540D, 426C, 4500CL-E, 4500CN-E, 4500F-C, 4500H+B, 4500NH3-H, 4500NO2B, 4500P-E, 4500 $S2^{-}$D, 510C, 5210B, 5220D, 5310C, 5540C. Organic Parameters: EPA 608, 624, 625, 8081, 8082, 8151, 8260, 8270, 8330.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1311, 1312, 9012, 9014, 9040, 9045, 9050, 9065.)

Department of Defense Certificate/Lab ID: L2217.
Drinking Water (Inorganic Parameters: SM 4500H-B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: EPA 200.7, 200.8, 6010B, 6020, 245.1, 245.2, 7470A, 9040B, 300.0, 332.0, 6860, 353.2, 410.4, 9060, 1664A, SM 4500CN-E, 4500H-B, 4500NO3-F, 5220D, 5310C, 2320B, 2540C, 3005A, 3015, 9010B, 9056. Organic Parameters: EPA 8260B, 8270C, 8330A, 625, 8082, 8081A, 3510C, 5030B, MassDEP EPH, MassDEP VPH.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 200.7, 6010B, 7471A, 9010, 9012A, 6860, 1311, 1312, 3050B, 7196A, 9010B, 3500-CR-D, 4500CN-CE, 2540G, Organic Parameters: EPA 8260B, 8270C, 8330A/B-prep, 8082, 8081A, 3540C, 3546, 3580A, 5035A, MassDEP EPH, MassDEP VPH.)

The following analytes are not included in our current NELAP/TNI Scope of Accreditation:
EPA 8260B: Freon-113, 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl naphthalene, Dimethyl naphthalene, Total Methylnapthalenes, Total Dimethylnaphthalenes, 1,4-Diphenylhydrazine (Azobenzene). **EPA 625:** 4-Chloroaniline, 4-Methylphenol. Total Phosphorus in a soil matrix, Chloride in a soil matrix, TKN in a soil matrix, NO2 in a soil matrix, NO3 in a soil matrix, SO4 in a soil matrix.

Serial_No:08231117:03

CHAIN OF CUSTODY

PAGE 1 OF 3

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 8/11/11

ALPHA Job #: L1112235

Client Information

Client: CDM - Laura A. Bugay
Address: One Cambridge Place
50 Hampshire St, Cambridge, MA 02139
Phone: (617) 452-6589
Fax: 617) 452-6589
Email: BugayLA@cdm.com
☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name: Charlton Landfill
Project Location: Charlton, Massachusetts
Project #: 75398 - 72037
Project Manager: Laura A. Bugay
ALPHA Quote #: 2008645

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)
Due Date: Time:

Other Project Specific Requirements/Comments/Detection Limits:
(If MS is required, indicate in Sample Specific Comments which samples and what tests MS to be performed. (Note: All CAM methods for inorganic analyses require MS every 20 soil samples)

Report Information — Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program: MCP Criteria:

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☒ Yes	☐ No	Are MCP Analytical Methods Required?
☐ Yes	☒ No	Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes	☒ No	Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☒ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	RCRA 8 Metals Method 6010B	EPH with GC Targets											Sample Specific Comments	TOTAL # BOTTLES
12235.1	SE-1	8/11/11	930	Soil	DV	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		1
2	SE-2		945	Soil		☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
3	SE-3		1000	Soil		☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
4	SE-4		1015	Soil		☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
5	SE-5		1030	Soil		☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
6	PR-1		800	Soil		☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
7	PR-2		820	Soil		☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
8	PR-3		835	Soil		☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
9	PR-4		855	Soil		☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
10	PR-5		910	Soil		☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						Container Type		A	A	-	-	-	-	-	-	-	-	-	-		
						Preservative		BA	BA	-	-	-	-	-	-	-	-	-	-		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

FORM NO. 01-01(I) (rev. 20-JAN-2010)

Relinquished By:	Date/Time	Received By:	Date/Time
	8/11/11 11:15		8/11/11 11:15

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

CHAIN OF CUSTODY

ALPHA ANALYTICAL
Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Serial_No:08231117:03

Date Rec'd in Lab: 8/11/11

ALPHA Job #: L1112235

Client Information

Client: CDM - Laura A. Bugay
Address: One Cambridge Place
50 Hampshire St, Cambridge, MA 02139
Phone: (617) 452-6589
Fax: 617) 452-6589
Email: BugayLA@cdm.com
☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name: Charlton Landfill
Project Location: Charlton, Massachusetts
Project #: 75398 - 72037
Project Manager: Laura A. Bugay
ALPHA Quote #: 2008645

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)
Due Date: Time:

Report Information Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☒ Yes	☐ No	Are MCP Analytical Methods Required?
☐ Yes	☒ No	Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes	☒ No	Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:
(If MS is required, indicate in Sample Specific Comments which samples and what tests MS to be performed. (Note: All CAM methods for inorganic analyses require MS every 20 soil samples)

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☒ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	RCRA 8 Metals Method 6010B	EPH with GC Targets	Sample Specific Comments	TOTAL # BOTTLES
1223 11	SP-1	8/11/11	6:40	Soil	DV	☒	☒		1
12	SP-2		6:45	Soil		☒	☒		
13	SP-3		6:50	Soil		☒	☒		
14	SP-4		6:55	Soil		☒	☒		
15	SP-5		7:00	Soil		☒	☒		
16	SP-6		7:05	Soil		☒	☒		
17	SP-7		7:10	Soil		☒	☒		
18	SP-8		7:15	Soil		☒	☒		
19	SP-9		7:20	Soil		☒	☒		
20	SP-10		7:25	Soil		☒	☒		
	Container Type					A	A		
	Preservative					A	A		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

FORM NO: 01-01(I) (rev. 20-JAN-2010)

Relinquished By:	Date/Time	Received By:	Date/Time
	8/11/11 1115		8/11/11 1115

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

CHAIN OF CUSTODY

PAGE 3 OF 3

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 8/11/11

ALPHA Job #: L1112235

Client Information

Client: CDM - Laura A. Bugay
Address: One Cambridge Place
50 Hampshire St, Cambridge, MA 02139
Phone: (617) 452-6589
Fax: 617) 452-6589
Email: BugayLA@cdm.com

☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name: Charlton Landfill
Project Location: Charlton, Massachusetts
Project #: 75398 - 72037
Project Manager: Laura A. Bugay
ALPHA Quote #: 2008645

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Other Project Specific Requirements/Comments/Detection Limits:
(If MS is required, indicate in Sample Specific Comments which samples and what tests MS to be performed. (Note: All CAM methods for inorganic analyses require MS every 20 soil samples)

Report Information Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☒ Yes	☐ No	Are MCP Analytical Methods Required?
☐ Yes	☒ No	Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes	☒ No	Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☒ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	RCRA 8 Metals Method 6010B	EPH with GC Targets	Sample Specific Comments	TOTAL # BOTTLES
12235 21	SP-11	8/11/11	730	Soil	DV	☒	☒		1
22	SP-12		735	Soil		☒	☒		
23	SP-13		740	Soil		☒	☒		
24	SP-14		745	Soil		☒	☒		
25	SP-15		750	Soil		☒	☒		
						☐	☐		
						☐	☐		
						☐	☐		
						☐	☐		
						☐	☐		

Container Type	-	-	-	-	-	-	-	-	-	-	-	-	
Preservative	-	-	-	-	-	-	-	-	-	-	-	-	

PLEASE ANSWER QUESTIONS ABOVE!

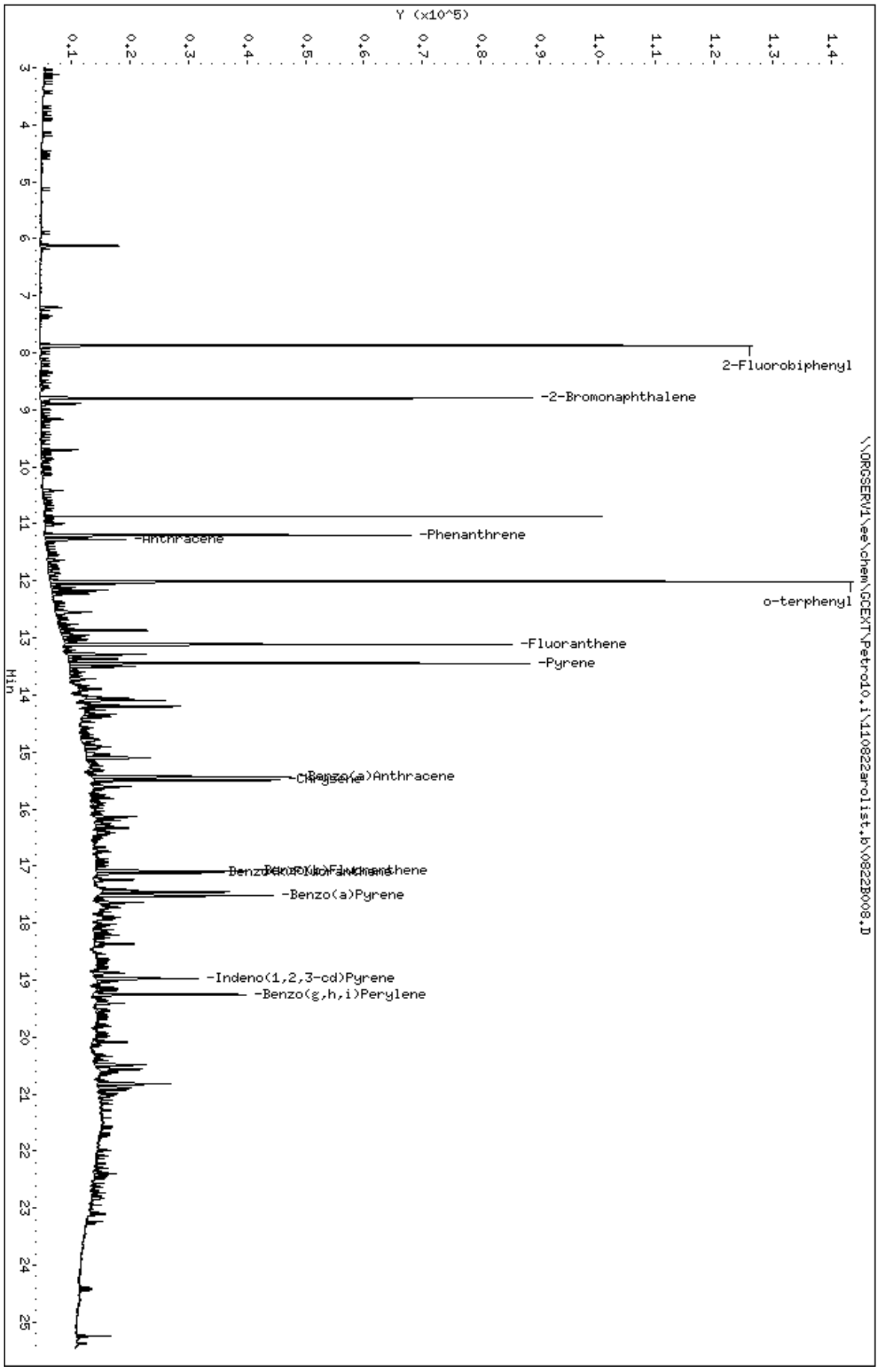
IS YOUR PROJECT MA MCP *or* CT RCP?

FORM NO: 01-01(I) (rev. 20-JAN-2010)

Relinquished By:	Date/Time	Received By:	Date/Time
	8/11/11 1115		8/11/11 1115

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

Serial No:08231117:03


Data File: \\ORGSERV1\ee\chem\GCEXT\Petrol0,i\110822arolist,b\0822B008.D
Date : 22-AUG-2011 19:25
Client ID:
Sample Info: 11112235-25,42,
Column phase:
Instrument: Petrol0,i
Operator: nh
Column diameter: 0.53
Page 3
Y (x10^5)
Min
2-Fluorobiphenyl
-2-Bromonaphthalene
-Anthracene
-Phenanthrene
o-terphenyl
-Fluoranthene
-Pyrene
-Benzo(a)Anthracene
-Benzo(a)Pyrene
-Indeno(1,2,3-cd)Pyrene
-Benzo(g,h,i)Perylene
\\ORGSERV1\ee\chem\GCEXT\Petrol0,i\110822arolist,b\0822B008.D

5 samples - perimeter road
5 samples from stockpile
5 samples from site entrance

10 grab / composite sample
2'+ depth in road & site entrance

EA-P metals
PH

WETLAND RESTORATION AND REPLICATION PLAN

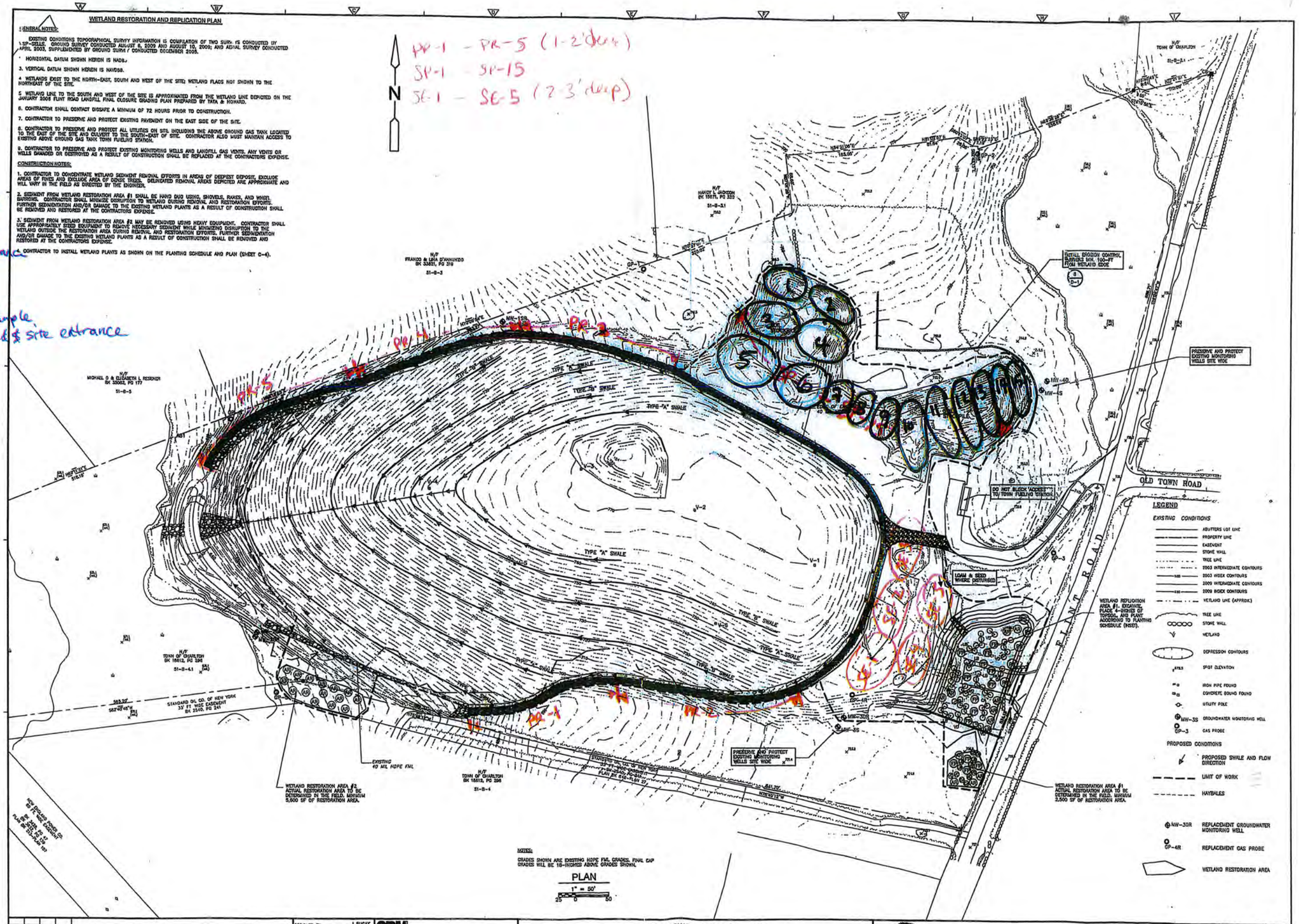
PR-1 - PR-5 (1-2' deep)
SP-1 - SP-15
SE-1 - SE-5 (2-3' deep)

GENERAL NOTES:

1. EXISTING CONDITIONS TOPOGRAPHICAL SURVEY INFORMATION IS COMPILATION OF TWO SURVEYS CONDUCTED BY SPF-SELLS GROUND SURVEY CONDUCTED AUGUST 6, 2009 AND AUGUST 10, 2009; AND AERIAL SURVEY CONDUCTED APRIL 2003, SUPPLEMENTED BY GROUND SURVEY CONDUCTED DECEMBER 2005.
2. HORIZONTAL DATUM SHOWN HEREON IS NAD83.
3. VERTICAL DATUM SHOWN HEREON IS NAVD88.
4. WETLANDS EXIST TO THE NORTH-EAST, SOUTH AND WEST OF THE SITE; WETLAND FLAGS NOT SHOWN TO THE NORTHEAST OF THE SITE.
5. WETLAND LINE TO THE SOUTH AND WEST OF THE SITE IS APPROXIMATED FROM THE WETLAND LINE DEPICTED ON THE JANUARY 2008 FLINT ROAD LANDFILL FINAL CLOSURE GRADING PLAN PREPARED BY TATA & HOWARD.
6. CONTRACTOR SHALL CONTACT DIGSAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
7. CONTRACTOR TO PRESERVE AND PROTECT EXISTING PAVEMENT ON THE EAST SIDE OF THE SITE.
8. CONTRACTOR TO PRESERVE AND PROTECT ALL UTILITIES ON SITE, INCLUDING THE ABOVE GROUND GAS TANK LOCATED TO THE EAST OF THE SITE AND CULVERT TO THE SOUTH-EAST OF SITE. CONTRACTOR ALSO MUST MAINTAIN ACCESS TO EXISTING ABOVE GROUND GAS TANK TOWN FUELING STATION.
9. CONTRACTOR TO PRESERVE AND PROTECT EXISTING MONITORING WELLS AND LANDFILL GAS VENTS. ANY VENTS OR WELLS DAMAGED OR DESTROYED AS A RESULT OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

CONSTRUCTION NOTES:

1. CONTRACTOR TO CONCENTRATE WETLAND SEDIMENT REMOVAL EFFORTS IN AREAS OF DEEPEST DEPOSIT, EXCLUDE AREAS OF FINES AND EXCLUDE AREA OF DENSE TREES. DELINEATED REMOVAL AREAS DEPICTED ARE APPROXIMATE AND WILL VARY IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SEDIMENT FROM WETLAND RESTORATION AREA #1 SHALL BE HAND DUG USING, SHOVELS, RAKES, AND WHEEL BARROWS. CONTRACTOR SHALL MINIMIZE DISRUPTION TO WETLAND DURING REMOVAL AND RESTORATION EFFORTS. FURTHER SEDIMENTATION AND/OR DAMAGE TO THE EXISTING WETLAND PLANTS AS A RESULT OF CONSTRUCTION SHALL BE REMOVED AND RESTORED AT THE CONTRACTORS EXPENSE.
3. SEDIMENT FROM WETLAND RESTORATION AREA #2 MAY BE REMOVED USING HEAVY EQUIPMENT. CONTRACTOR SHALL USE APPROPRIATELY SIZED EQUIPMENT TO REMOVE NECESSARY SEDIMENT WHILE MINIMIZING DISRUPTION TO THE WETLAND OUTSIDE THE RESTORATION AREA DURING REMOVAL AND RESTORATION EFFORTS. FURTHER SEDIMENTATION AND/OR DAMAGE TO THE EXISTING WETLAND PLANTS AS A RESULT OF CONSTRUCTION SHALL BE REMOVED AND RESTORED AT THE CONTRACTORS EXPENSE.
4. CONTRACTOR TO INSTALL WETLAND PLANTS AS SHOWN ON THE PLANTING SCHEDULE AND PLAN (SHEET C-4).



NOTES:
GRADES SHOWN ARE EXISTING HDPE FML GRADES. FINAL CAP GRADES WILL BE 18-INCHES ABOVE GRADES SHOWN.

PLAN
1" = 50'
25 0 50

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: L.RUGAY
DRAWN BY: L. RUGAY
SHEET CHK'D BY: S.HASKELL
CROSS CHK'D BY:
APPROVED BY: S. HASKELL
DATE: SEPTEMBER 2010

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting • engineering • construction • operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH

LANDFILL CLOSURE PROJECT

WETLAND RESTORATION PLAN

PROJECT NO. 75398-72037
FILE NAME: CSTPL004
SHEET NO.
C-3

Barrier Protection Material
Geotechnical Testing

CDM Smith

02200 -

YANKEE ENGINEERING & TESTING, INC.

April 21, 2011

RECEIVED
4/22/11
Per

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton, MA 01510

RE: "Barrier Soil" Test Result
Charlton S.L.F.
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

The purpose of this letter is to present the results of laboratory tests performed on sample #L-18936, submitted April 12th 2011. The sample, 50± lb., was stated to represent "onsite soil". Laboratory testing consisted of a gradation/hydrometer (ASTM D-422) analysis, modified moisture/density (proctor) relationship, and a one (1) point triaxial cell permeability test. The soil permeability was measured using ASTM D-5084 ("triaxial") instead of ASTM D2434 ("constant head") method as the 26% silt/clay content exceeded the 10% maximum allowable for ASTM D-2434. The soil, for use as "barrier soil", was specified to have a maximum hydraulic conductivity (permeability) of 1.0×10^{-4} cm/sec.

The gradation/hydrometer/atterberg results classified the soil as a dark gray SM: silty sand with gravel. The maximum dry density (proctor value) was found to be 122.2 pcf, at 9.5% optimum moisture, in accordance with ASTM D-698. The curves associated with these tests are shown on the attached data sheets. The atterberg limits, consisting of the soil's plastic and liquid limits, were 23 and 26, (resulting in a plasticity index of only 3), in accordance with ASTM D-4318, indicating the soil fines to have limited "clayeyness".

The soil specimen for testing was compacted into a nominal 1/50 cubic foot mold in six lifts using a 5.5 lb. hammer falling twelve inches. The number of blows on each layer was determined by trial and error until the resulting dry density was about 90% of the soil's maximum dry density. The soil was compacted at a moisture content of 14%, which was about 5% over the "compaction optimum", to simulate expected field conditions.

It should be noted that the measured dry density of the specimen was determined using the physical dimensions as measured in the laboratory. A ruler, circumference gauge, and digital balance were used to determine the volume and density of the test specimen. There are slight deficiencies inherent in determining the dry density in this manner, as the specimen ends may not be trimmed to form the exact shape of a right circular cylinder.

The specimen was sealed in a membrane and subjected to confining pressure and initial vacuum pressures, that were applied to achieve a minimum 95% saturation level. Once theoretical saturation was noted, the permeability coefficient was measured by monitoring the inflow/outflow volumes. The Table below summarizes the permeability test conditions:

Sample I.D.	Test Cell No. #	Cell Pressure (psi)	Head pressure (psi)	Back Pressure (psi)	Confining Stress (psi)	Hydraulic Gradient
L-18936	1	75	70	65	10	37.0

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

April 21, 2011 (2)

Mr. John Bates
J. Bates & Son, LLC

RE: "Barrier Soil" Test Result
Charlton S.L.F.
Charlton, Massachusetts Project # 11015

Triaxial Permeability Test Data Summary

Sample # L-18936 Source: Onsite "Barrier Soil"

Preparation: Laboratory Compacted Lifts
Notes: Specimen prepared at a moisture content of 14%± that was slightly higher than the 9.5% compaction optimum, which resulted in 88%± compaction.

INITIAL SPECIMEN CONDITIONS			FINAL SPECIMEN CONDITIONS		
Diameter	(cm.)	7.18	**Diameter**	(cm.)	7.24
Length	(cm.)	9.42	**Length**	(cm.)	9.14
L/D Ratio	n/a	1.31	**L/D Ratio**	n/a	1.26
Moisture Content	(%)	14.4	**Moisture Content**	(%)	16.6
Wet Density	(pcf)	123.7	**Wet Density**	(pcf)	125.5
Dry Density	(pcf)	108.1	**Dry Density**	(pcf)	107.6
Max Dry Density	(pcf)	122.2	**Max Dry Density**	(pcf)	122.2
Compaction	(%)	88.5%	**Compaction**	(%)	88.1%

Hydraulic ("permeability") Conductivity (cm/sec): 2.7×10^{-6} cm/sec

It should be noted that the small differences between initial and final specimen conditions may be attributed to the methods used to measure the specimen, which may not be an exact right circular cylinder.

Based on the above result, the proposed soil met the required 1.0×10^{-4} cm/sec maximum permeability when compacted to 88%± of its maximum dry density. However, it should also be noted that the permeability of cohesive soils is inversely related to the degree of compaction, as well as, the molded moisture content. Thus, specimens prepared at lower compaction and/or moisture contents would tend to show higher/faster permeability rates.

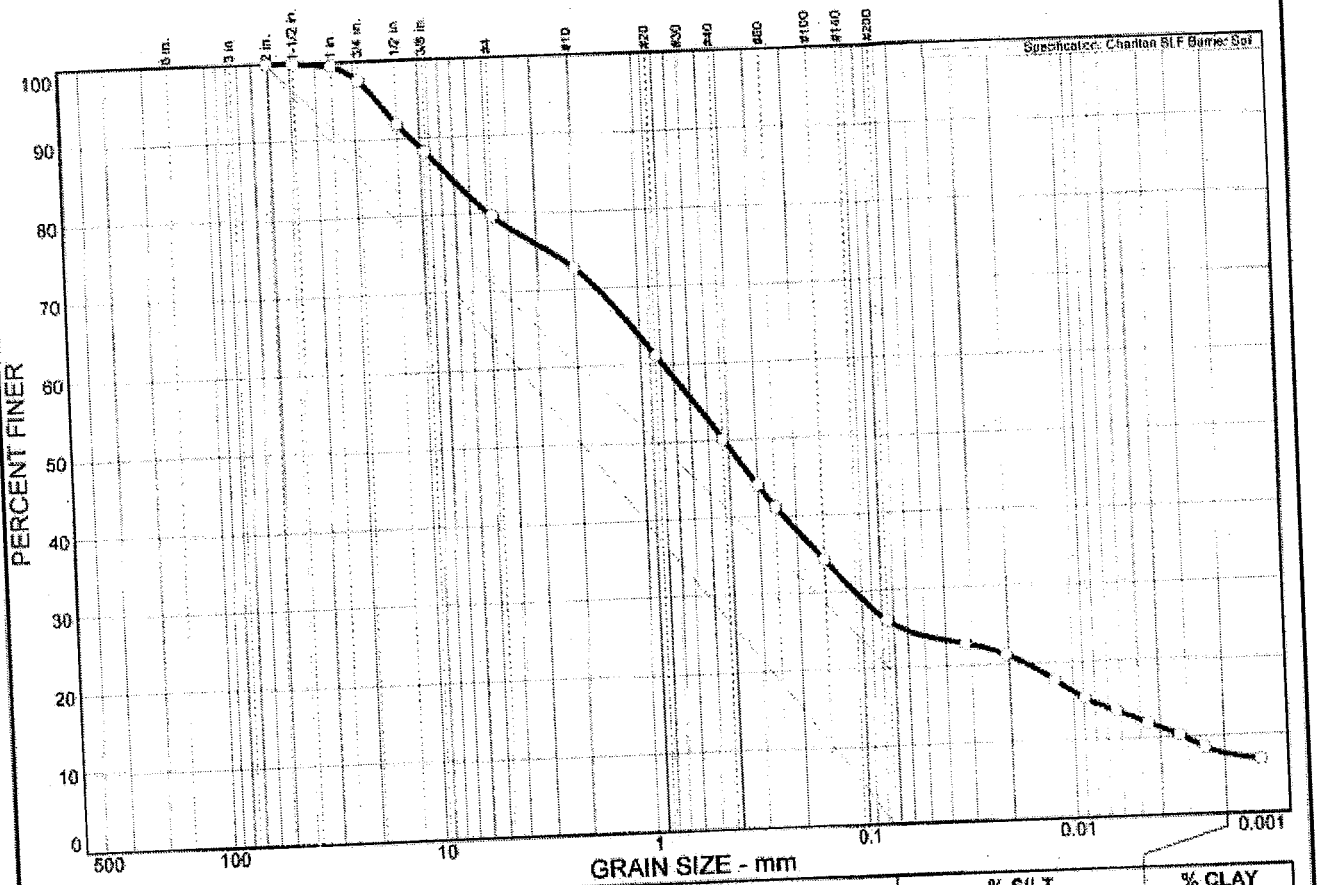
We appreciate this opportunity to be of assistance. Should you have questions, or require additional testing services, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J. Parker, P.E.
Director of Testing Services
WJP:rap
enc.
cc: Mr. Chris Czermak/RBS

YANKEE ENGINEERING & TESTING, INC.

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	20.3	53.6	18.4	7.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0	100 - 100	
1-1/2 in.	100.0		
1 in.	99.6		
3/4 in.	97.6		
1/2 in.	91.8		
3/8 in.	88.2	100 95-100	X
#4	79.7		
#10	72.7		
#20	61.2		
#40	50.1	8-85	
#50	44.1		
#60	41.2	1-50	
#100	34.2	0 - 20	X
#200	26.1		

* Charlton SLF Barrier Soil

Soil Description

Dark gray 2" max silty sand some gravel
Silty sand with gravel
D-698 proctor = 122.2 pcf @ 9.5% optimum moisture

Atterberg Limits

PL= 23 LL= 26 PI= 3

Coefficients

D_{85}= 7.41 D_{60}= 0.786 D_{50}= 0.423
D_{30}= 0.109 D_{15}= 0.0084 D_{10}= 0.0031
C_u= 250.48 C_c= 4.78

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

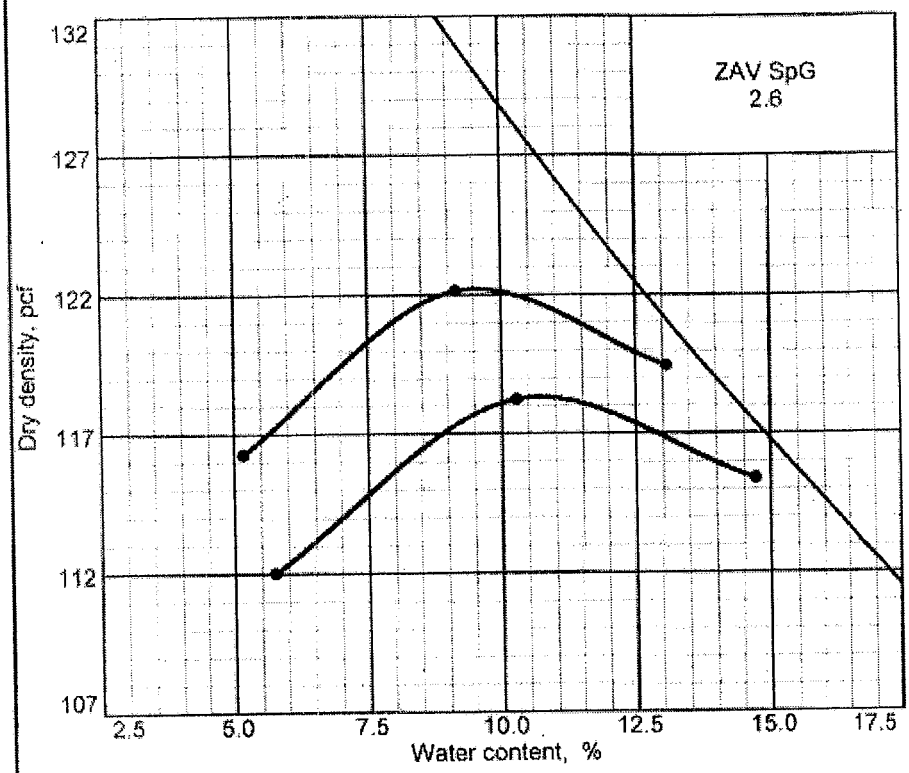
Sample submitted by client (Bates) on 4/12/11
sample slightly siltier than "barrier soil" limits
perm = 2.7 x 10-6 cm/sec (see 4/21 /11 letter)

Sample No.: L-18936 **Source of Sample:** Onsite **Date:** 4/15/11
Location: proposed "Barrier Soil" **Elev./Depth:** submitted

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

COMPACTION TEST REPORT



Curve No.
L-18936

Test Specification:
ASTM D-698 Method B (corrected) Standard
Oversize correction applied to each point

Hammer Wt.: 5.5
Hammer Drop: 12
Number of Layers: 3
Blows per Layer: 25
Mold Size: .03333 cu.ft.

Test Performed on Material Passing 3/8 in. **Sieve**

Soil Data

NM _____ **Sp.G.** _____
LL 26 **PI** 3
%>3/8 in. 11.8 **%<#200** 26.1
USCS SM **AASHTO** A-2-4(0)

TESTING DATA

	1	2	3	4	5	6
WM + WS	6020.0	6200.0	6230.0			
WM	4230.0	4230.0	4230.0			
WW + T #1	68.30	64.70	64.90			
WD + T #1	64.80	60.00	58.10			
TARE #1	12.20	12.60	12.40			
WW + T #2	66.40	63.40	63.80			
WD + T #2	63.90	58.40	57.10			
TARE #2	12.40	11.40	11.10			
MOISTURE	5.2	9.2	13.1			
DRY DENSITY	116.3	122.1	119.5			

ROCK CORRECTED TEST RESULTS

Maximum dry density = 122.2 pcf

Optimum moisture = 9.5 %

Material Description

Dark gray 2" max silty sand some gravel
Silty sand with gravel
D-698 proctor = 122.2 pcf @ 9.5% optimum moisture

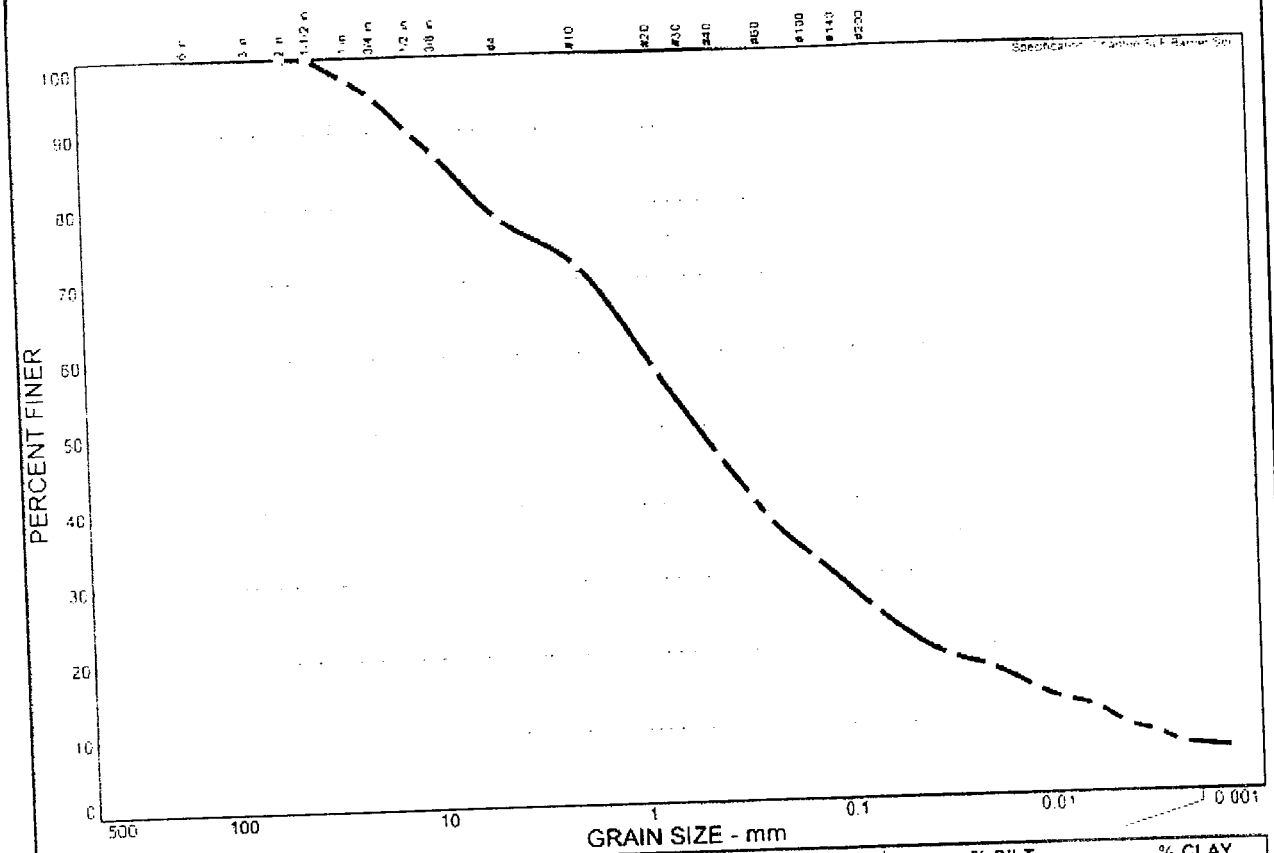
Project No. 11015 **Client:** J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
• **Location:** proposed "Barrier Soil"

Remarks:

COMPACTION TEST REPORT

YANKEE ENGINEERING & TESTING, INC.

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	21.8	53.0	19.0	6.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0	100 - 100	
1-1/2 in	100.0		
1 in.	97.1		
3/4 in.	94.8		
1/2 in.	90.0		
3/8 in.	86.8		
#4	78.2		
#10	71.7		
#20	57.6		
#30	46.0		
#40	40.5		
#50	37.7		
#60	34.7		
#100	32.2		
#200	25.2	0 - 20	X

* Charlton SLF Barrier Soil

Soil Description

Dark gray 2" max silty sand some gravel
Silty sand with gravel (fines slightly plastic)
no additional lab tests requested

Atterberg Limits

PL= not tested LL= not tested PI= not tested

Coefficients

D_{85}= 8.24 D_{60}= 0.969 D_{50}= 0.545
D_{30}= 0.120 D_{15}= 0.0141 D_{10}= 0.0051
C_u= 189.05 C_c= 2.91

Classification

USCS= SM AASHTO= A-1-b

Remarks

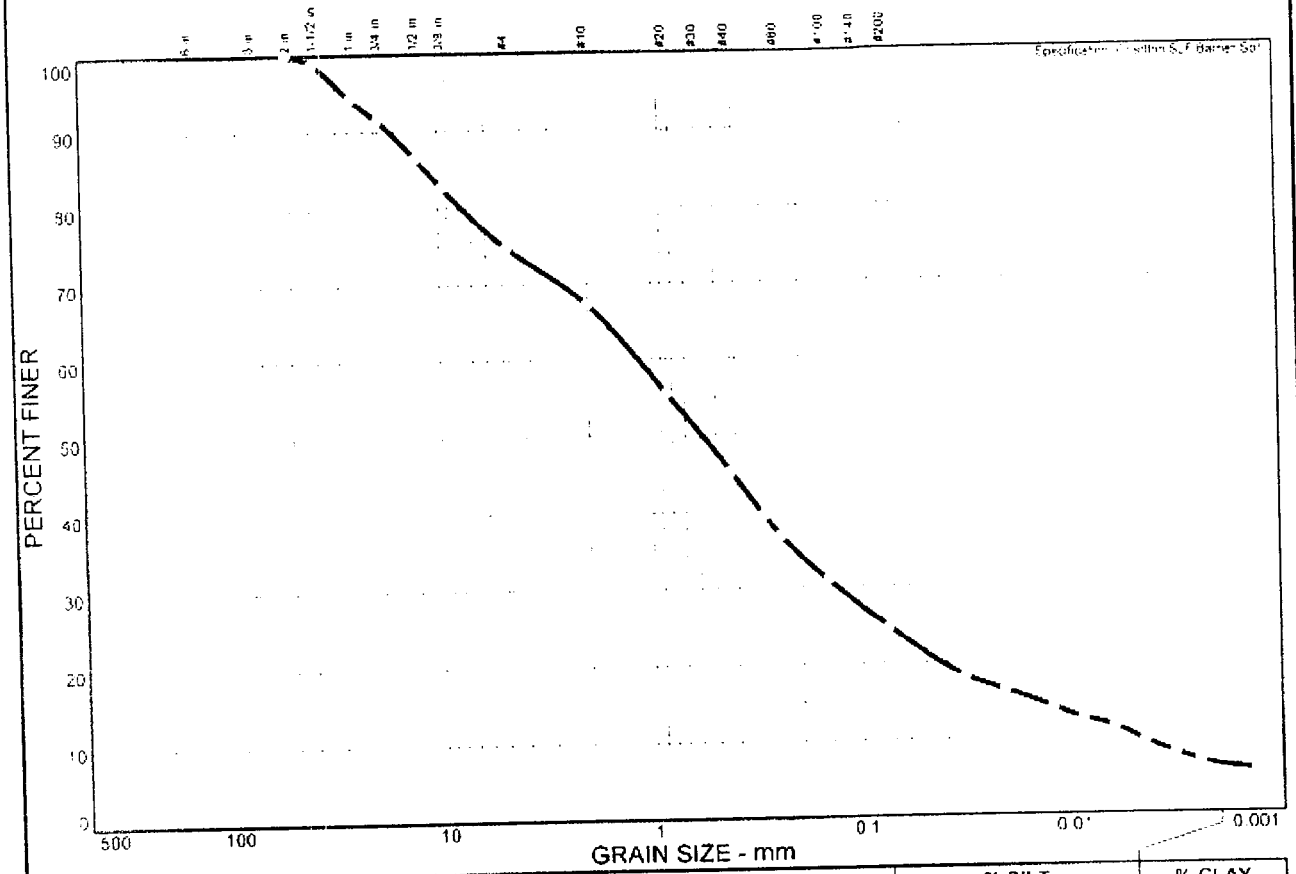
Sample submitted by client on 05/03/11
sample similar to original barrier sample L-18936

Sample No.: L-19006 **Source of Sample:** Onsite Barrier Soil **Date:** 5/4/11
Location: Barrier Soil **Elev./Depth:** 3000 e.x.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	25.3	50.0	18.5	6.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0	100 - 100	
1-1/2 in.	98.8		
1 in.	94.3		
3/4 in.	91.5		
1/2 in.	86.5		
3/8 in.	82.7		
#4	74.7		
#10	67.2		
#20	55.5		
#40	45.2		
#50	39.5		
#60	36.8		
#100	31.0		
#200	24.7	0 - 20	X

* Charlton SLF Barrier Soil

Soil Description

Dark gray 2" max silty sand some gravel
Silty sand with gravel
D-698 proctor = 125.0 pcf @ 8.0% optimum moisture

Atterberg Limits

PL= 21 LL= 26 PI= 5

Coefficients

D_{85}= 11.3 D_{60}= 1.15 D_{50}= 0.582
D_{30}= 0.135 D_{15}= 0.0153 D_{10}= 0.0049
C_u= 233.83 C_c= 3.21

Classification

USCS= SM AASHTO= A-1-b

Remarks

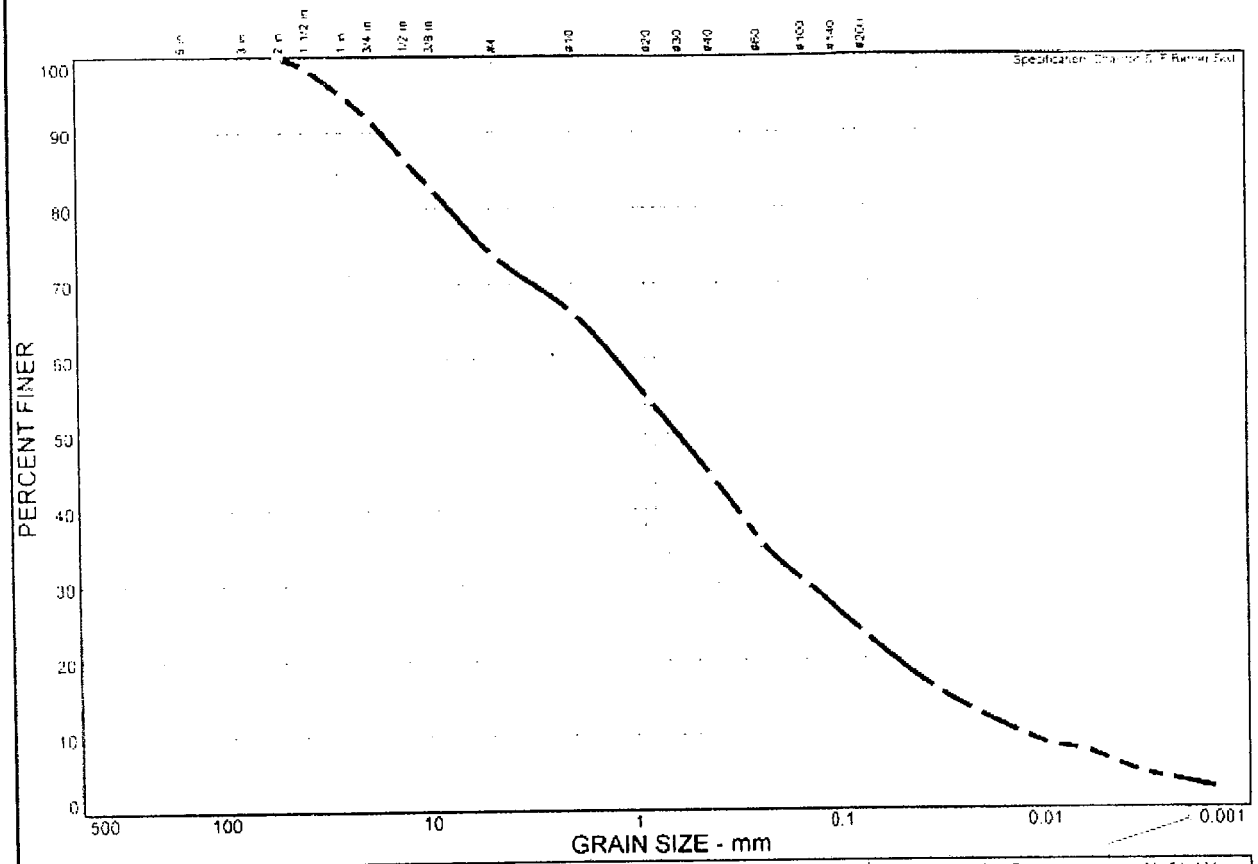
Sample submitted by client on 5/3/11
see separate letters for permeabiltiy and shear tests

Sample No.: L-19007 **Source of Sample:** Onsite Barrier Soil **Date:** 5/6/11
Location: Barrier Soil **Elev./Depth:** 4500 c.y.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	26.3	50.4	19.9	3.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0	100 - 100	
1-1/2 in.	98.4		
1 in.	94.8		
3/4 in.	91.8		
1/2 in.	86.4		
3/8 in.	82.7		
#4	73.7		
#10	66.1		
#20	54.4		
#40	44.2		
#50	38.6		
#60	35.7		
#100	30.2		
#200	23.3	0 - 20	X

* Charlton SLF Barrier Soil

Soil Description

Sample submitted by client on 05/03/11
Silty sand with gravel (fines slightly plastic)
no additional lab tests requested

Atterberg Limits

PL= not tested LL= not tested PI= not tested

Coefficients

D_{85}= 11.4 D_{60}= 1.24 D_{50}= 0.628
D_{30}= 0.147 D_{15}= 0.0297 D_{10}= 0.0130
C_u= 95.56 C_c= 1.34

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample submitted by client on 5/3/11
Sample similar to original barrier sample L-18936

Sample No.: L-19008 **Source of Sample:** Onsite Barrier Soil **Date:** 5/6/11
Location: Barrier Soil **Elev./Depth:** 6000 c.y.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

YANKEE ENGINEERING & TESTING, INC.

May 10, 2011

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton, MA 01510

RE: 4,500 c.y. "Barrier Soil" Test Results
Charlton S.L.F.
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

The purpose of this letter is to present the results of lab tests on sample #L-19007, submitted May 3rd 2011, and stated to represent the "4500 cy onsite barrier soil". Testing consisted of a gradation/hydrometer (ASTM D-422) analysis, standard moisture/density (proctor) relationship, and a one (1) point triaxial cell permeability test. The soil permeability was measured using ASTM D-5084 ("triaxial") instead of ASTM D2434 ("constant head") method as the 25% silt/clay content exceeded the 10% maximum allowable for ASTM D-2434. The soil, for use as "barrier soil", was specified to have a maximum hydraulic conductivity (permeability) of 1.0×10^{-4} cm/sec.

The gradation/hydrometer/atterberg results classified the soil as a dark gray SM: silty sand with gravel. The maximum dry density (proctor value) was found to be 125.0 pcf, at 8.0% optimum moisture, in accordance with ASTM D-698. The curves associated with these tests are shown on the attached data sheets. The atterberg limits, consisting of the soil's plastic and liquid limits, were 21 and 26, (resulting in a plasticity index of only 5), in accordance with ASTM D-4318, indicating the soil fines to have limited "clayeyness".

The soil specimen for testing was compacted into a nominal 1/50 cubic foot mold in six lifts using a 5.5 lb. hammer falling twelve inches. The number of blows on each layer was determined by trial and error until the resulting dry density was about 90% of the soil's maximum dry density. The soil was compacted at a moisture content of 14%, which was about 5% over the "compaction optimum", to simulate expected field conditions.

It should be noted that the measured dry density of the specimen was determined using the physical dimensions as measured in the laboratory. A ruler, circumference gauge, and digital balance were used to determine the volume and density of the test specimen. There are slight deficiencies inherent in determining the dry density in this manner, as the specimen ends may not be trimmed to form the exact shape of a right circular cylinder.

The specimen was sealed in a membrane and subjected to confining pressure and initial vacuum pressures, that were applied to achieve a minimum 95% saturation level. Once theoretical saturation was noted, the permeability coefficient was measured by monitoring the inflow/outflow volumes. The Table below summarizes the permeability test conditions:

Sample I.D.	Test Cell No. #	Cell Pressure (psi)	Head pressure (psi)	Back Pressure (psi)	Confining Stress (psi)	Hydraulic Gradient
L-19007	1	75	70	65	10	32.2

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
[illegible]

May, 2011 (2)

Mr. John Bates
J. Bates & Son, LLC

RE: "Barrier Soil" Test Result
Charlton S.L.F.
Charlton, Massachusetts

Project # 11015

Triaxial Permeability Test Data Summary
Sample #L-19007 Source: Onsite "4,500 c.y. Barrier Soil"

Preparation: Laboratory Compacted Lifts
Notes: Specimen prepared at a moisture content of 13%± that was slightly higher than the 8% compaction optimum, which resulted in 90%± compaction.

INITIAL SPECIMEN CONDITIONS			FINAL SPECIMEN CONDITIONS		
Diameter	(cm.)	7.24	Diameter	(cm.)	7.20
Length	(cm.)	10.74	Length	(cm.)	10.49
L/D Ratio	n/a	1.48	L/D Ratio	n/a	1.46
Moisture Content	(%)	13.3	Moisture Content	(%)	15.4
Wet Density	(pcf)	127.3	Wet Density	(pcf)	129.5
Dry Density	(pcf)	112.4	Dry Density	(pcf)	112.2
Max Dry Density	(pcf)	125.0	Max Dry Density	(pcf)	125.0
Compaction	(%)	89.9%	Compaction	(%)	89.8%

Hydraulic ("permeability") Conductivity (cm/sec): 1.8×10^{-6} cm/sec ✓

It should be noted that the small differences between initial and final specimen conditions may be attributed to the methods used to measure the specimen, which may not be an exact right circular cylinder.

Based on the above result, the proposed soil met the required 1.0×10^{-4} cm/sec maximum permeability when compacted to 90%± of its maximum dry density. However, it should also be noted that the permeability of cohesive soils is inversely related to the degree of compaction, as well as, the molded moisture content. Thus, specimens prepared at lower compaction and/or moisture contents would tend to show higher/faster permeability rates.

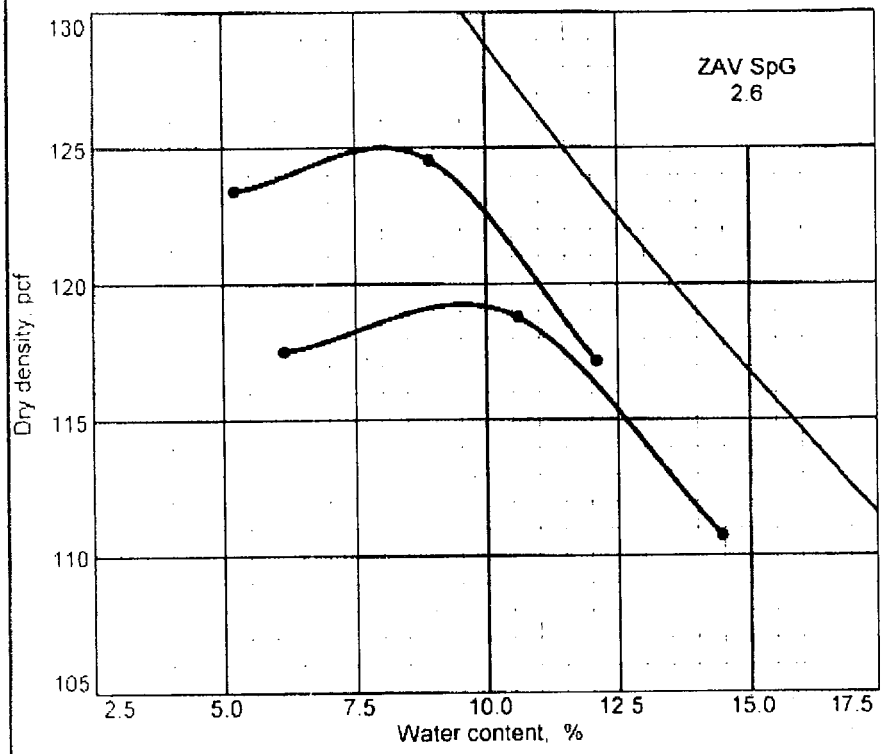
We appreciate this opportunity to be of assistance. Should you have questions, or require additional testing services, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J. Parker, P.E.
Director of Testing Services
WJP:rap
enc.
cc: Mr. Chris Czernak/RBS

YANKEE ENGINEERING & TESTING, INC.

COMPACTION TEST REPORT



Curve No.
L-19007

Test Specification:
ASTM D-698 Method B (corrected) Standard
Oversize correction applied to each point

Hammer Wt.: 5.5
Hammer Drop: 12
Number of Layers: 3
Blows per Layer: 25
Mold Size: .03333 cu.ft.

Test Performed on Material Passing 3/8 in **Sieve**

Soil Data

NM		**Sp.G.**	
LL	26	**PI**	5
%>3/8 in.	17.3	**%<#200**	24.7
USCS	SM	**AASHTO**	A-1-b

TESTING DATA

	1	2	3	4	5	6
WM + WS	6233.0	6322.0	6245.0			
WM	4330.0	4330.0	4330.0			
WW + T #1	65.10	69.90	71.20			
WD + T #1	61.80	63.80	63.60			
TARE #1	12.30	12.70	11.70			
WW + T #2	65.40	72.90	74.00			
WD + T #2	61.60	67.80	66.20			
TARE #2	13.80	12.40	11.60			
MOISTURE	7.2	8.9	12.1			
DRY DENSITY	123.4	124.6	117.2			

ROCK CORRECTED TEST RESULTS

Maximum dry density = 125.0 pcf

Optimum moisture = 8.0 %

Material Description

Dark gray 2" max silty sand some gravel
Silty sand with gravel
D-698 proctor 125.0 pcf @ 8.0% optimum moisture

Project No. 11015 **Client:** J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
• **Location:** Barrier Soil

Remarks:

COMPACTION TEST REPORT

YANKEE ENGINEERING & TESTING, INC.

YANKEE ENGINEERING & TESTING, INC.

May 12, 2011

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton, MA 01510

RE: Saturated Direct Shear Test Results
Barrier Soil vs. Drainage Net
Charlton S.L.F.
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

We submit attached herewith the result of one (1) saturated Direct Shear Test, completed in accordance with ASTM D-5321 methods, using a 12" x 12" shear box, on the soil vs geocomposite drainage net interface. The internal maximum "friction angle" was calculated based on the normal stress values versus the measured maximum shear stress values. The following Table presents the material and test information.

Soil Sample #L - 19007 **Source: Onsite "Barrier Soil" 4,500 c.y.**
Soil Description: - SM: Dark gray silty sand some gravel
Membrane: Submitted: Geocomposite Drainage Net
Substrate: Well Compacted Fine Sand
D-698 Proctor Data: Max. Dry Density = 125.0 pcf Opt Moist. = 8.0%

Test Condition: Dry Density = 112.5 pcf Moisture = 8.0% Compaction = 90%

Applied Normal Stress, lb.	200	400	800
Applied Normal Stress, psi	1.4	2.8	5.6
Maximum Shear Stress, psi	0.72	1.69	1.21
Cohesion (C) Value, psi	0	0	0
Individual Friction Angle	**27.3°**	**31.2°**	**29.4°**

Ave. Friction Angle, from attached graph = 30°

As can be seen above, and on the attached data sheet, the 30° interface friction angle met the stated 26° minimum. Should you have any questions, or if we can be of additional testing assistance, please do not hesitate to contact me at our Worcester office.

Very truly yours,

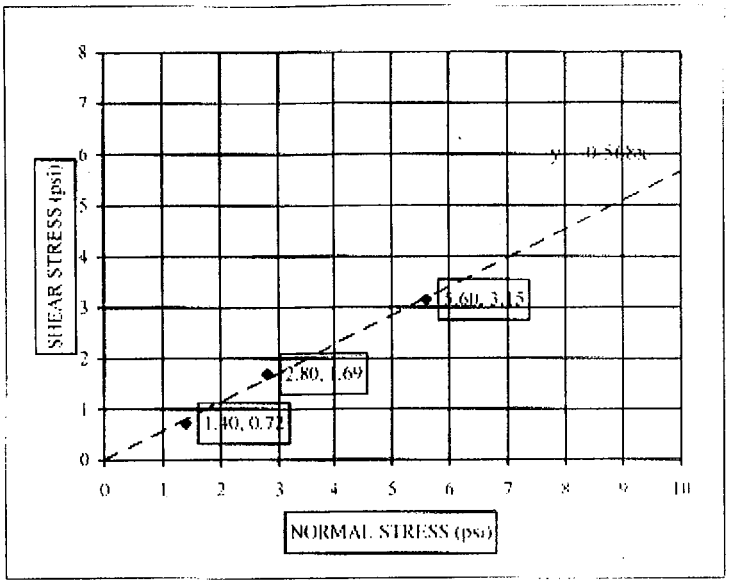
Whitney J. Parker, P.E.
Director of Testing Services
WJP/rap
enc.
cc: Chris Czermak/JBS

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388

ASTM D-5321 Soil/Geosynthetic Friction by Direct Shear (Saturated Condition)

Project:	11015	
Project #:	Charlton SLF	
Soil ID #:	L-19007	
Soil Desc:	onsite silty sand some gravel	
Membrane:	composite drainage net	
Max Dry Density:	125.0	pcf
Optimum Moisture:	8.0	%
Test Dry Density:	112.5	pcf
Wt. of Dry Soil:	17000	grams
% Compaction:	90.0	%
% Moisture:	8.0	%
Shear Rate:	.04	in/min
Shear Correction:	0	psi
Date:	May 5 to 11, 2011	
Tech:	KN/JO/KN/WP	

Disp.	#1	#2	#3
0.00	10	14	24
0.05	12	20	54
0.10	14	44	102
0.15	18	68	180
0.20	28	90	264
0.25	40	142	350
0.30	60	182	424
0.35	82	226	450
0.40	90	238	454
0.45	98	244	452
0.50	104	244	450
0.55	102	238	432
0.60	102	230	422
0.65	100	230	420
0.70	98	230	428
0.75	100	220	416
0.80	96	214	400
0.85	96	210	388
0.90	92	202	376
0.95	90	192	366
1.00	86	178	364
1.05	82	174	370
1.10	82	170	372
1.15	86	172	374
1.20	84	178	368
1.25	82	174	362
1.30	82	170	360
1.35	82	172	364
1.40	82	174	368
1.45	84	176	364
1.50	82	174	364

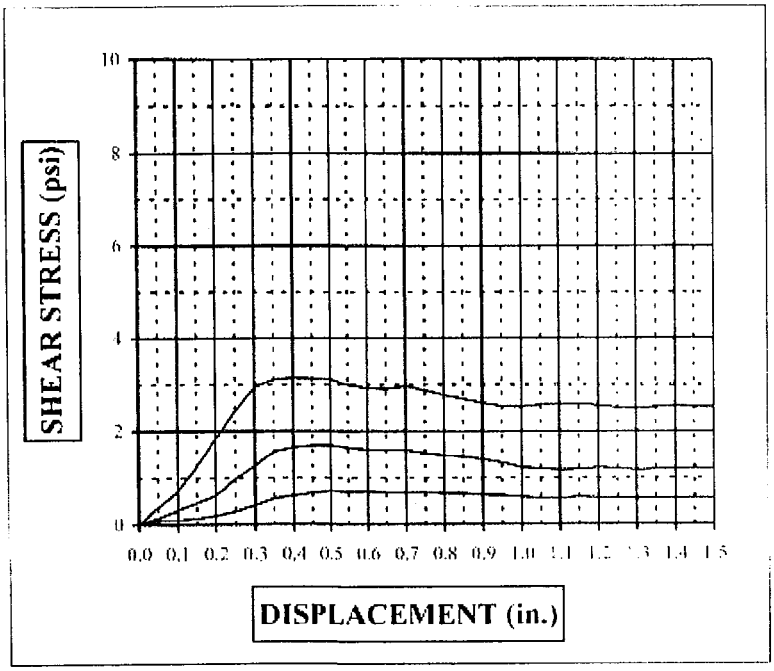


Cohesion (C) 0 psi

Ø = 30 degrees

Loading 200 lb. = 1.4 psi 400 lb. = 2.8 psi 800 lb. 5.6 psi

#1	Normal	1.4 psi	Max.	0.72 psi	Residual	0.57 psi
#2	Normal	2.8 psi	Max.	1.69 psi	Residual	1.21 psi
#3	Normal	5.6 psi	Max.	3.15 psi	Residual	2.53 psi



Remarks: Soil vs. geocomposite drainage net interface shear angle was 30° which met the stated 26° minimum.
Refer to letter dated May 12, 2011 for a summary of the test data and result.

Yankee Engineering and Testing, Inc.
10 Mason St., Worcester, MA 01609
phone 508-831-7404 fax. 508-831-7388

YANKEE ENGINEERING & TESTING, INC.

June 22, 2011

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton, MA 01510

RE: 7,500 c.y. "Barrier Soil" Test Results
Charlton S.L.F.
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

The purpose of this letter is to present the results of lab tests on sample #**L-19196**, submitted June 15th 2011, and stated to represent the "7500 cy onsite barrier soil". Testing consisted of a gradation/hydrometer (ASTM D-422) analysis, modified moisture/density (proctor) relationship, and a one (1) point triaxial cell permeability test. The soil permeability was measured using ASTM D-5084 ("triaxial") instead of ASTM D2434 ("constant head") method as the 28% silt/clay content far exceeded the 10% maximum allowable for ASTM D-2434. The soil, for use as "barrier soil", was specified to have a maximum hydraulic conductivity (permeability) of 1.0×10^{-4} cm/sec.

The gradation/hydrometer/atterberg results classified the soil as a brown SM: silty sand with gravel. The soil's maximum dry density (proctor value) was determined to be 126.7 pcf, at 8.4% optimum moisture content, in accordance with ASTM D-1557. The curves associated with these tests are shown on the attached data sheets. An Atterberg limits test was not requested or performed, however, the soil fines did appear "slightly plastic" during laboratory handling/testing indicating limited "clayeyness".

The soil specimen for testing was compacted into a nominal 1/50 cubic foot mold in six lifts using a 5.5 lb. hammer falling twelve inches. The number of blows on each layer was determined by trial and error until the resulting dry density was about 90% of the soil's maximum dry density. The soil was compacted at a moisture content of 15%, which was about 6% over the "compaction optimum", to simulate expected field conditions.

It should be noted that the measured dry density of the specimen was determined using the physical dimensions as measured in the laboratory. A ruler, circumference gauge, and digital balance were used to determine the volume and density of the test specimen. There are slight deficiencies inherent in determining the dry density in this manner, as the specimen ends may not be trimmed to form the exact shape of a right circular cylinder.

The specimen was sealed in a membrane and subjected to confining pressure and initial vacuum pressures that were applied to achieve a minimum 95% saturation level. Once theoretical saturation was noted, the permeability coefficient was measured by monitoring the inflow/outflow volumes. The Table below summarizes the permeability test conditions:

Sample I.D.	Test Cell No. #	Cell Pressure (psi)	Head pressure (psi)	Back Pressure (psi)	Confining Stress (psi)	Hydraulic Gradient
L-19196	1	75	70	65	10	31.3

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

June 22, 2011 (2)

Mr. John Bates
J. Bates & Son, LLC

RE: 7,500 c.y. "Barrier Soil" Test Results
Charlton S.L.F.
Charlton, Massachusetts

Project # 11015

Triaxial Permeability Test Data Summary
Sample #L-19196 Source: Onsite "7,500 c.y. Barrier Soil"

Preparation: Laboratory Compacted Lifts
Notes: Specimen prepared at a moisture content of 15%± that was slightly higher than the 8.4% compaction optimum, which resulted in 90%± compaction.

INITIAL SPECIMEN CONDITIONS			FINAL SPECIMEN CONDITIONS		
Diameter	(cm.)	7.22	**Diameter**	(cm.)	7.22
Length	(cm.)	11.05	**Length**	(cm.)	10.80
L/D Ratio	n/a	1.53	**L/D Ratio**	n/a	1.50
Moisture Content	(%)	14.6	**Moisture Content**	(%)	15.5
Wet Density	(pcf)	128.3	**Wet Density**	(pcf)	129.9
Dry Density	(pcf)	112.0	**Dry Density**	(pcf)	112.5
Max Dry Density	(pcf)	126.7	**Max Dry Density**	(pcf)	126.7
Compaction	(%)	88.4%	**Compaction**	(%)	88.8%

Hydraulic ("permeability") Conductivity (cm/sec): 3.7×10^{-7} cm/sec ✓

It should be noted that the small differences between initial and final specimen conditions may be attributed to the methods used to measure the specimen, which may not be an exact right circular cylinder.

Based on the above result, the proposed soil met the required 1.0×10^{-4} cm/sec maximum permeability when compacted to 90%± of its maximum dry density. However, it should also be noted that the permeability of cohesive soils is inversely related to the degree of compaction, as well as, the molded moisture content. Thus, specimens prepared at lower compaction and/or moisture contents would tend to show higher/faster permeability rates.

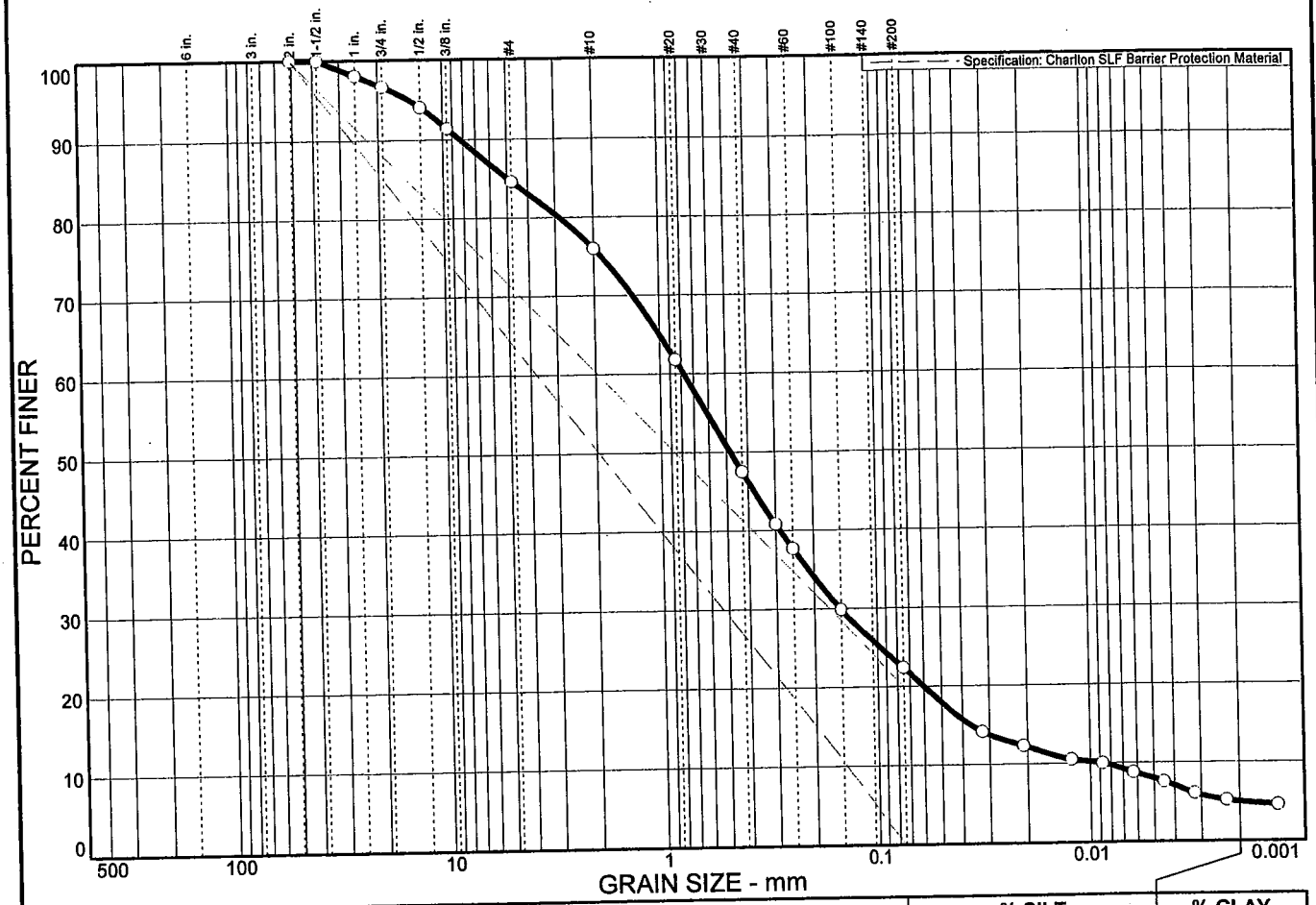
We appreciate this opportunity to be of assistance. Should you have questions, or require additional testing services, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J. Parker, P.E.
Director of Testing Services
WJP:rap
enc.
cc: Mr. Chris Czermak/RBS
r:/works/project/10015/19007/19196.barrier.7500.triax.06221

YANKEE ENGINEERING & TESTING, INC.

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	15.4	62.2	17.4	5.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0	100 - 100	
1-1/2 in.	100.0		
1 in.	98.1		
3/4 in.	96.7		
1/2 in.	94.1		
3/8 in.	91.4		
#4	84.6		
#10	76.0		
#20	61.8		
#40	47.5		
#50	40.8		
#60	37.7		
#100	29.9		
#200	22.4	0 - 20	X

* Charlton SLF Barrier Protection Material

Soil Description

Dark gray 2" max silty sand little gravel
Silty sand with gravel (fines appeared slightly plastic)
no additional lab tests requested

Atterberg Limits

PL= untested LL= untested PI= untested

Coefficients

D_{85}= 4.96 D_{60}= 0.777 D_{50}= 0.480
D_{30}= 0.151 D_{15}= 0.0367 D_{10}= 0.0087
C_u= 88.87 C_c= 3.36

Classification

USCS= SM AASHTO= A-1-b

Remarks

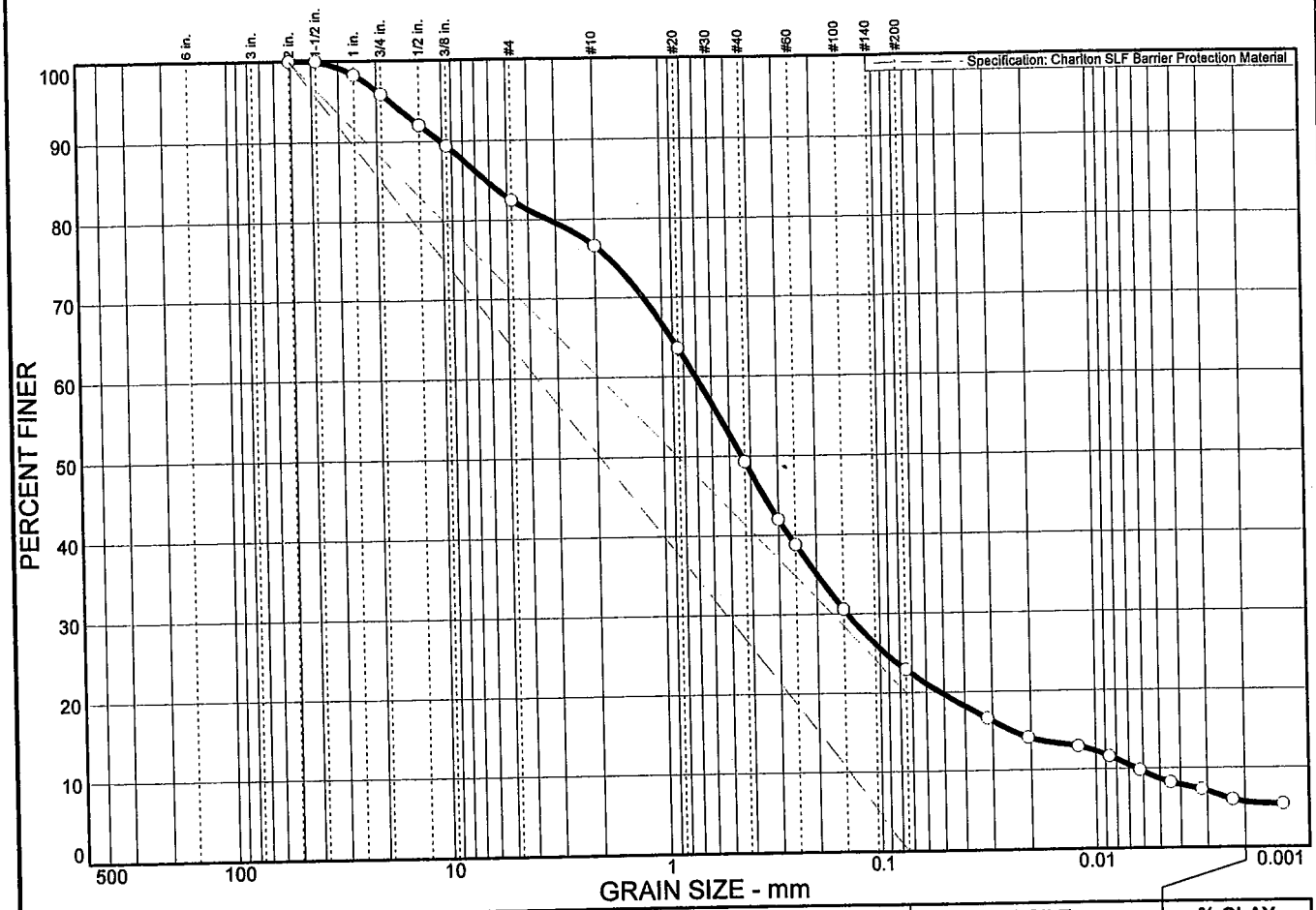
Sample submitted by client on 6/22/11
sample similar to previously tested barrier soils

Sample No.: L-19222 **Source of Sample:** Onsite Barrier Soil **Date:** 6/23/11
Location: Barrier Soil **Elev./Depth:** 9000 c.y.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	17.5	59.6	17.2	5.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0	100 - 100	✓
1-1/2 in.	100.0		
1 in.	98.3		
3/4 in.	95.9		
1/2 in.	92.0		
3/8 in.	89.4		
#4	82.5		
#10	76.6		
#20	63.6		
#40	49.3		
#50	42.0		
#60	38.8		
#100	30.6		
#200	22.9	0 - 20	X OK

* Charlton SLF Barrier Protection Material

Soil Description

Dark gray 2" max silty sand little gravel
Silty sand with gravel (fines were slightly plastic)
D-1557 proctor = 127.5 pcf @ 9.2% optimum moisture

Atterberg Limits

PL= untested LL= untested PI= untested

Coefficients

D_{85}= 6.22 D_{60}= 0.707 D_{50}= 0.439
D_{30}= 0.144 D_{15}= 0.0247 D_{10}= 0.0064
C_u= 109.72 C_c= 4.53

Classification

USCS= SM AASHTO= A-1-b

Remarks

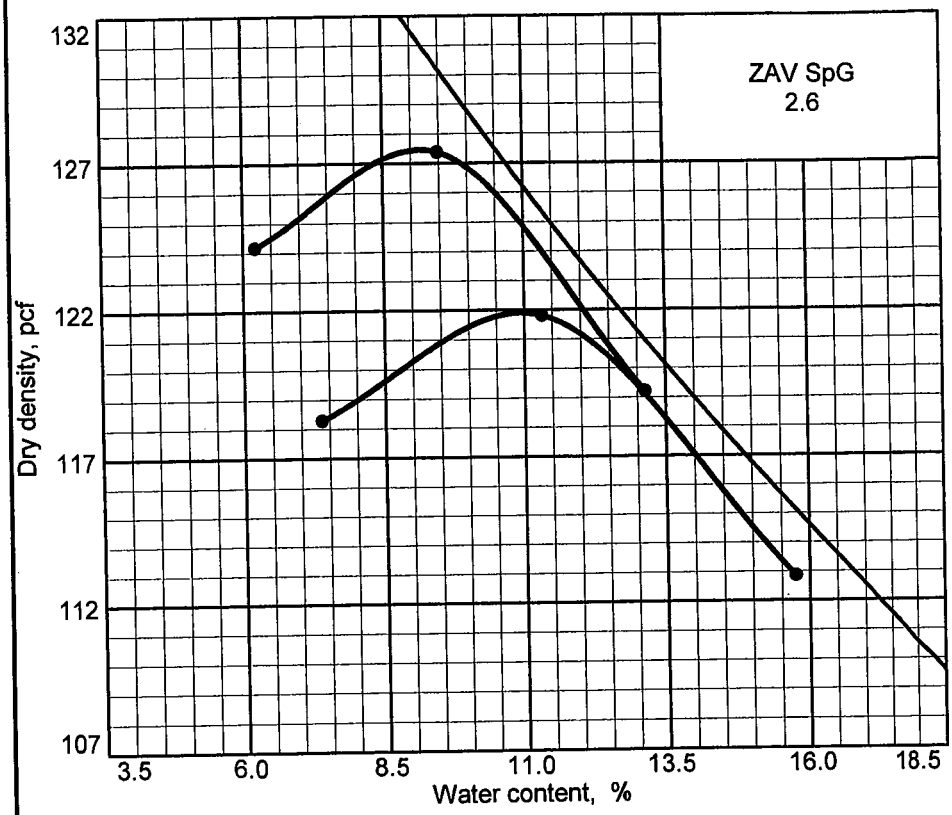
Sample submitted by client on 6/22/11
perm = 1.2 x 10-6 cm/sec (6/23/11 letter)
direct shear vs geonet (test results in 6/29/11 letter)

Sample No.: L-19223 **Source of Sample:** Onsite Barrier Soil **Date:** 6/23/11
Location: Barrier Soil **Elev./Depth:** 10,500 c.y.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

COMPACTION TEST REPORT



Curve No.
L-19223

Test Specification:
ASTM D-1557 Method A (corrected) Mod.
Oversize correction applied to each point

Hammer Wt.: 10
Hammer Drop: 18
Number of Layers: 5
Blows per Layer: 25
Mold Size: .03333 cu.ft.

Test Performed on Material Passing No.4 **Sieve**

Soil Data

NM _____ **Sp.G.** _____
LL untested **PI** untested
%>No.4 17.5 **%<#200** 22.9
USCS SM **AASHTO** A-1-b

TESTING DATA

	1	2	3	4	5	6
WM + WS	6150.0	6280.0	6205.0			
WM	4230.0	4230.0	4230.0			
WW + T #1	65.70	66.80	65.00			
WD + T #1	61.80	61.20	57.30			
TARE #1	12.00	10.70	12.00			
WW + T #2	66.10	68.00	65.50			
WD + T #2	62.70	62.40	58.80			
TARE #2	13.40	13.90	12.60			
MOISTURE	6.2	9.5	13.1			
DRY DENSITY	124.2	127.4	119.2			

ROCK CORRECTED TEST RESULTS

Maximum dry density = 127.5 pcf

Optimum moisture = 9.2 %

Material Description

Dark gray 2" max silty sand little gravel
Silty sand with gravel (fines were slightly plastic)
D-1557 proctor = 127.5 pcf @ 9.2% optimum

Project No. 11015 **Client:** J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
● **Location:** Barrier Soil

Remarks:

COMPACTION TEST REPORT

YANKEE ENGINEERING & TESTING, INC.

YANKEE ENGINEERING & TESTING, INC.

June 23, 2011

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton, MA 01510

RE: 10,500 c.y. "Barrier Soil" Test Results
Charlton S.L.F.
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

The purpose of this letter is to present the results of lab tests on sample #**L-19223**, submitted June 22nd 2011, and stated to represent the "10,500 cy onsite barrier soil". Testing consisted of a gradation/hydrometer (per ASTM D-422) analysis, modified moisture/density (proctor) relationship, and a one (1) point triaxial cell permeability test. The soil permeability was measured using ASTM D-5084 ("triaxial") instead of ASTM D2434 ("constant head") method as the 23% silt/clay content far exceeded the 10% maximum allowable for ASTM D-2434. The soil, for use as "barrier soil", was specified to have a maximum hydraulic conductivity (permeability) of 1.0×10^{-4} cm/sec.

The gradation/hydrometer/atterberg results classified the soil as a dark gray SM: silty sand with gravel. The soil's maximum dry density (proctor value) was determined to be 127.5 pcf, at 9.2% optimum moisture content, in accordance with ASTM D-1557. The curves associated with these tests are shown on the attached data sheets. An Atterberg limits test was not requested or performed, however, the soil fines did appear "slightly plastic" during laboratory handling/testing indicating limited "clayeyness".

The soil specimen for testing was compacted into a nominal 1/50 cubic foot mold in six lifts using a 5.5 lb. hammer falling twelve inches. The number of blows on each layer was determined by trial and error until the resulting dry density was about 90% of the soil's maximum dry density. The soil was compacted at a moisture content of 14%, which was about 5% over the "compaction optimum", to simulate expected field conditions.

It should be noted that the measured dry density of the specimen was determined using the physical dimensions as measured in the laboratory. A ruler, circumference gauge, and digital balance were used to determine the volume and density of the test specimen. There are slight deficiencies inherent in determining the dry density in this manner, as the specimen ends may not be trimmed to form the exact shape of a right circular cylinder.

The specimen was sealed in a membrane and subjected to confining pressure and initial vacuum pressures that were applied to achieve a minimum 95% saturation level. Once theoretical saturation was noted, the permeability coefficient was measured by monitoring the inflow/outflow volumes. The Table below summarizes the permeability test conditions:

Sample I.D.	Test Cell No. #	Cell Pressure (psi)	Head pressure (psi)	Back Pressure (psi)	Confining Stress (psi)	Hydraulic Gradient
L-19223	2	75	70	65	10	30.9

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

June 23, 2011 (2)

Mr. John Bates
J. Bates & Son, LLC

RE: 10,500 c.y. "Barrier Soil" Test Results
Charlton S.L.F.
Charlton, Massachusetts Project # 11015

Triaxial Permeability Test Data Summary
Sample #L-19223 Source: Onsite "10,500 c.y. Barrier Soil"

Preparation: Laboratory Compacted Lifts
Notes: Specimen prepared at a moisture content of 14%± that was slightly higher than the 8.4% compaction optimum, which resulted in 90%± compaction.

INITIAL SPECIMEN CONDITIONS			FINAL SPECIMEN CONDITIONS		
Diameter	(cm.)	7.24	**Diameter**	(cm.)	7.22
Length	(cm.)	11.36	**Length**	(cm.)	10.94
L/D Ratio	n/a	1.57	**L/D Ratio**	n/a	1.52
Moisture Content	(%)	13.6	**Moisture Content**	(%)	15.8
Wet Density	(pcf)	129.0	**Wet Density**	(pcf)	133.2
Dry Density	(pcf)	113.6	**Dry Density**	(pcf)	115.0
Max Dry Density	(pcf)	126.7	**Max Dry Density**	(pcf)	126.7
Compaction	(%)	89.6%	**Compaction**	(%)	90.8%

Hydraulic ("permeability") Conductivity (cm/sec): 1.2×10^{-6} cm/sec ✓

It should be noted that the small differences between initial and final specimen conditions may be attributed to the methods used to measure the specimen, which may not be an exact right circular cylinder.

Based on the above result, the proposed soil met the required 1.0×10^{-4} cm/sec maximum permeability when compacted to 90%± of its maximum dry density. However, it should also be noted that the permeability of cohesive soils is inversely related to the degree of compaction, as well as, the molded moisture content. Thus, specimens prepared at lower compaction and/or moisture contents would tend to show higher/faster permeability rates.

We appreciate this opportunity to be of assistance. Should you have questions, or require additional testing services, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J. Parker, P.E.
Director of Testing Services
WJP:rap
enc.
cc: Mr. Chris Czermak/RBS
r:\works\project\10015\19007\191223.barrier.10500.triax.06231

YANKEE ENGINEERING & TESTING, INC.

YANKEE ENGINEERING & TESTING, INC.

June 29, 2011

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton, MA 01510

RE: Saturated Direct Shear Test Results
10,500 c.y. Barrier Soil vs. Drainage Net
Charlton S.L.F.
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

We submit attached herewith the result of one (1) saturated Direct Shear Test, completed in accordance with ASTM D-5321 methods, using a 12" x 12" shear box, on the soil vs geocomposite drainage net interface. The internal maximum "friction angle" was calculated based on the normal stress values versus the measured maximum shear stress values. The following Table presents the material and test information.

Soil Sample #L - 19223 **Source: Onsite "Barrier Soil" - 10,500 c.y. Sample**
Soil Description: - SM: Dark gray silty sand little gravel
Membrane: Submitted: Geocomposite Drainage Net
Substrate: Well Compacted Fine Sand
D-1557 Proctor Data: Max. Dry Density = 127.5 pcf Opt Moist. = 9.2%

Test Condition: Dry Density = 114.8 pcf Moisture = 9.2% Compaction = 90%

Applied Normal Stress, lb.	200	400	800
Applied Normal Stress, psi	1.39	2.78	5.56
Maximum Shear Stress, psi	0.78	1.53	1.14
Cohesion (C) Value, psi	0	0	0
Individual Friction Angle	**29.2°**	**28.8°**	**30.0°**

Ave. Friction Angle, from attached graph = 30° ✓

As can be seen above, and on the attached data sheet, the 30° interface friction angle met the stated 26° minimum. Should you have any questions, or if we can be of additional testing assistance, please do not hesitate to contact me at our Worcester office.

Very truly yours,

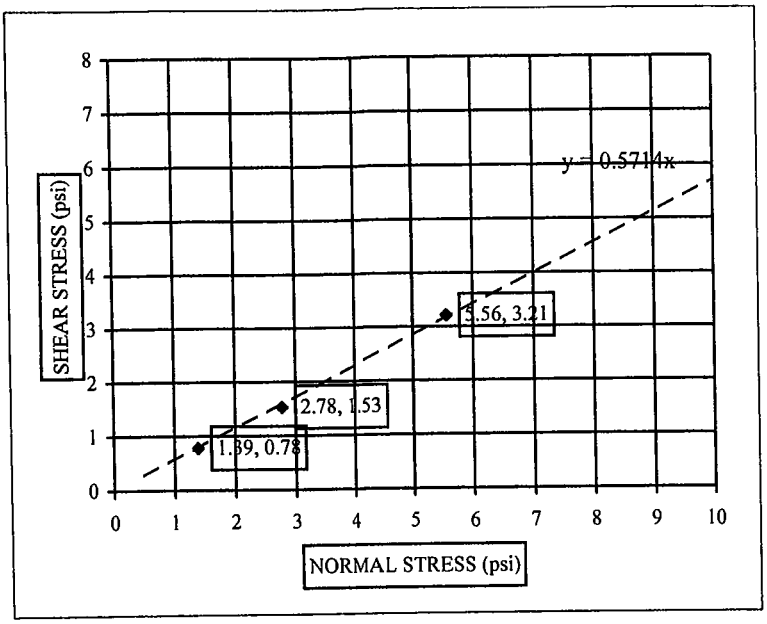
Whitney J. Parker, P.E.
Director of Testing Services
WJP/rap
enc.
cc: Chris Czermak/JBS
r/works/project/11015/19223.shear.barrier.10500.net.06291

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

ASTM D-5321 Soil/Geosynthetic Friction by Direct Shear (Saturated Condition)

Project:	**11015**
Project #:	**Charlton SLF**
Soil ID #:	**L-19223**
Soil Desc:	onsite silty sand some gravel
Membrane:	composite drainage net
Max Dry Density:	127.5 pcf
Optimum Moisture:	9.2 %
Test Dry Density:	114.8 pcf
Wt. of Dry Soil:	17350 grams
% Compaction:	90.0 %
% Moisture:	9.2 %
Shear Rate:	.04 in/min
Shear Correction:	0 psi
Date:	June 24 to 28, 2011
Tech:	RM/RM/KN/WP

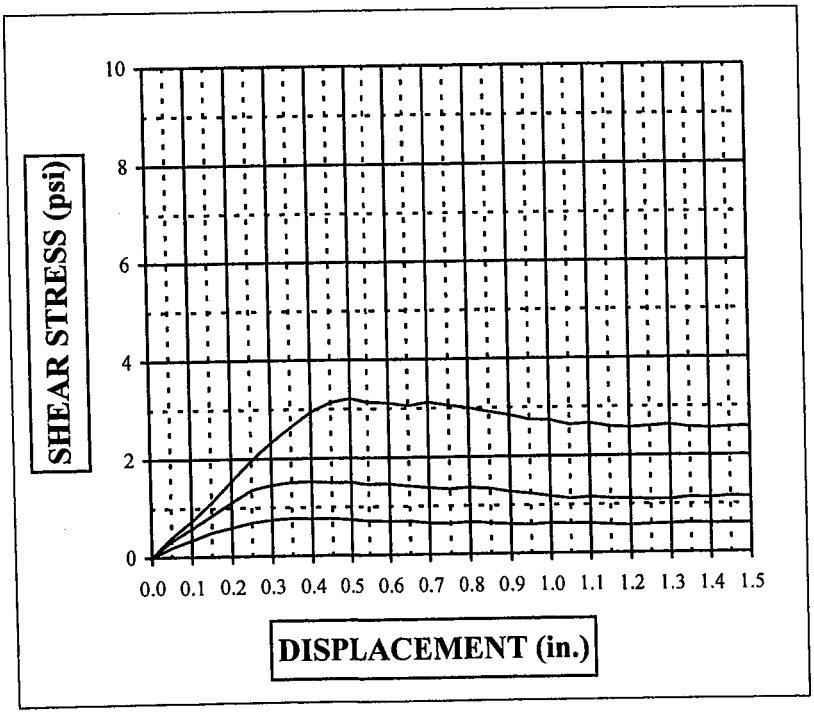
Disp.	#1	#2	#3
0.00	16	20	30
0.05	28	48	58
0.10	50	84	106
0.15	72	122	160
0.20	86	160	222
0.25	100	196	282
0.30	108	210	334
0.35	112	218	380
0.40	110	220	424
0.45	110	216	452
0.50	106	216	462
0.55	102	210	452
0.60	100	210	448
0.65	100	204	440
0.70	94	198	450
0.75	92	194	440
0.80	96	198	432
0.85	92	194	420
0.90	88	184	410
0.95	86	178	396
1.00	90	170	394
1.05	88	162	380
1.10	88	166	384
1.15	84	162	374
1.20	82	160	370
1.25	84	158	374
1.30	86	158	378
1.35	88	164	370
1.40	86	162	368
1.45	86	166	370
1.50	86	164	372



Cohesion (C) = 0 psi

Θ = 30 degrees

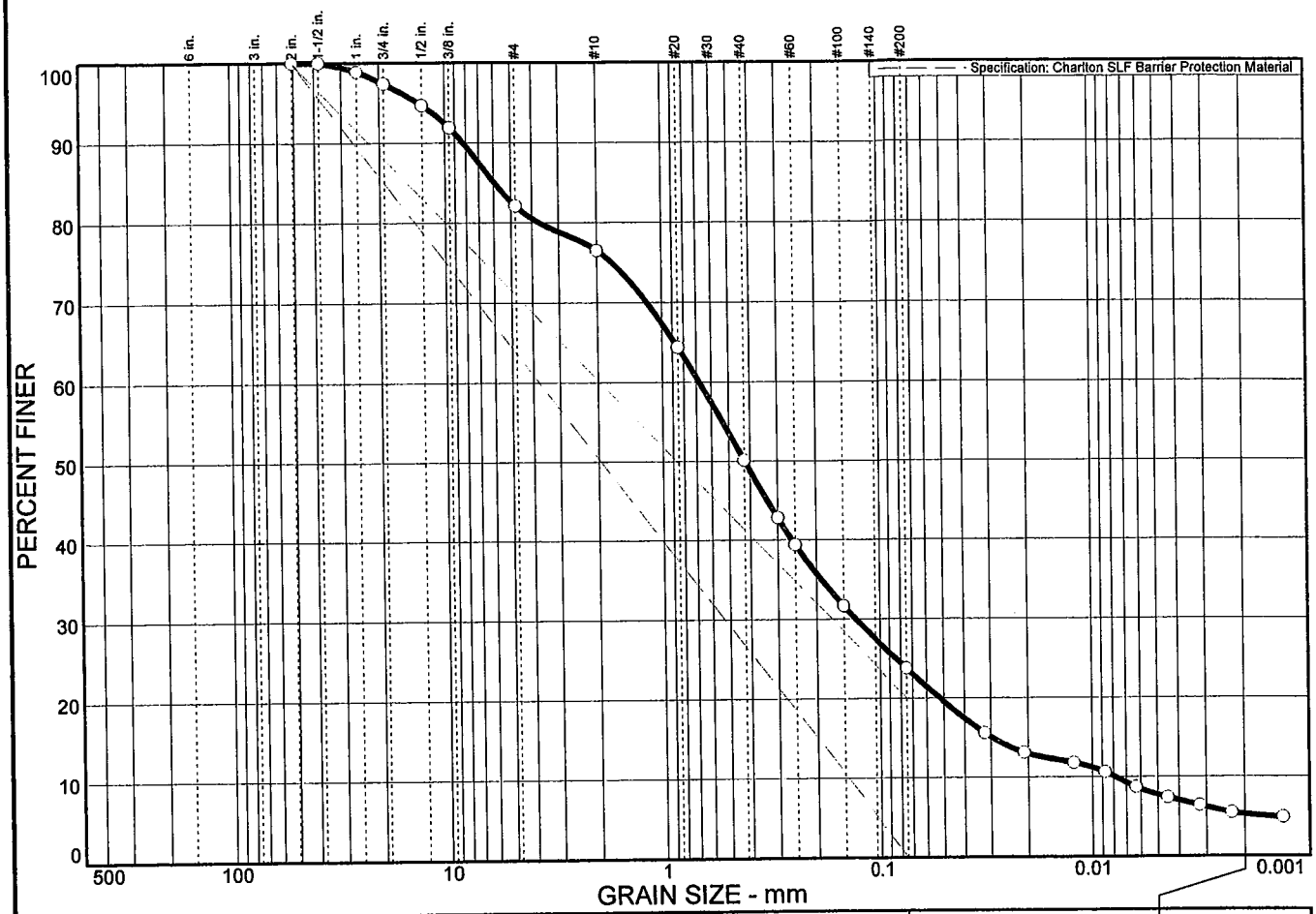
	Normal Loading	#1 = 200 lb.		#2 = 400 lb.		#3 = 800 lb.
#1	Normal	1.39 psi	Max.	0.78 psi	Residual	0.60 psi
#2	Normal	2.78 psi	Max.	1.53 psi	Residual	1.14 psi
#3	Normal	5.56 psi	Max.	3.21 psi	Residual	2.58 psi



Remarks: Soil vs. geocomposite drainage net interface shear angle was 30° which met the stated 26° minimum.
Refer to letter dated June 29, 2011 for a summary of the shear test data and result.

Yankee Engineering and Testing, Inc.
10 Mason St., Worcester, MA 01609
phone 508-831-7404 fax. 508-831-7388

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	17.9	58.3	18.5	5.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0	100 - 100	✓
1-1/2 in.	100.0		
1 in.	98.9		
3/4 in.	97.4		
1/2 in.	94.7		
3/8 in.	91.9		
#4	82.1		
#10	76.5		
#20	64.4		
#40	50.1		
#50	42.8		
#60	39.4		
#100	31.7		
#200	23.8	0 - 20	X OK

* Charlton SLF Barrier Protection Material

Soil Description

Dark gray 2" max silty sand little gravel
Silty sand with gravel (fines appeared slightly plastic)
no additional lab tests requested

Atterberg Limits

PL= untested LL= untested PI= untested

Coefficients

D_{85}= 5.93 D_{60}= 0.679 D_{50}= 0.423
D_{30}= 0.131 D_{15}= 0.0295 D_{10}= 0.0079
C_u= 86.41 C_c= 3.21

Classification

USCS= SM AASHTO= A-1-b

Remarks

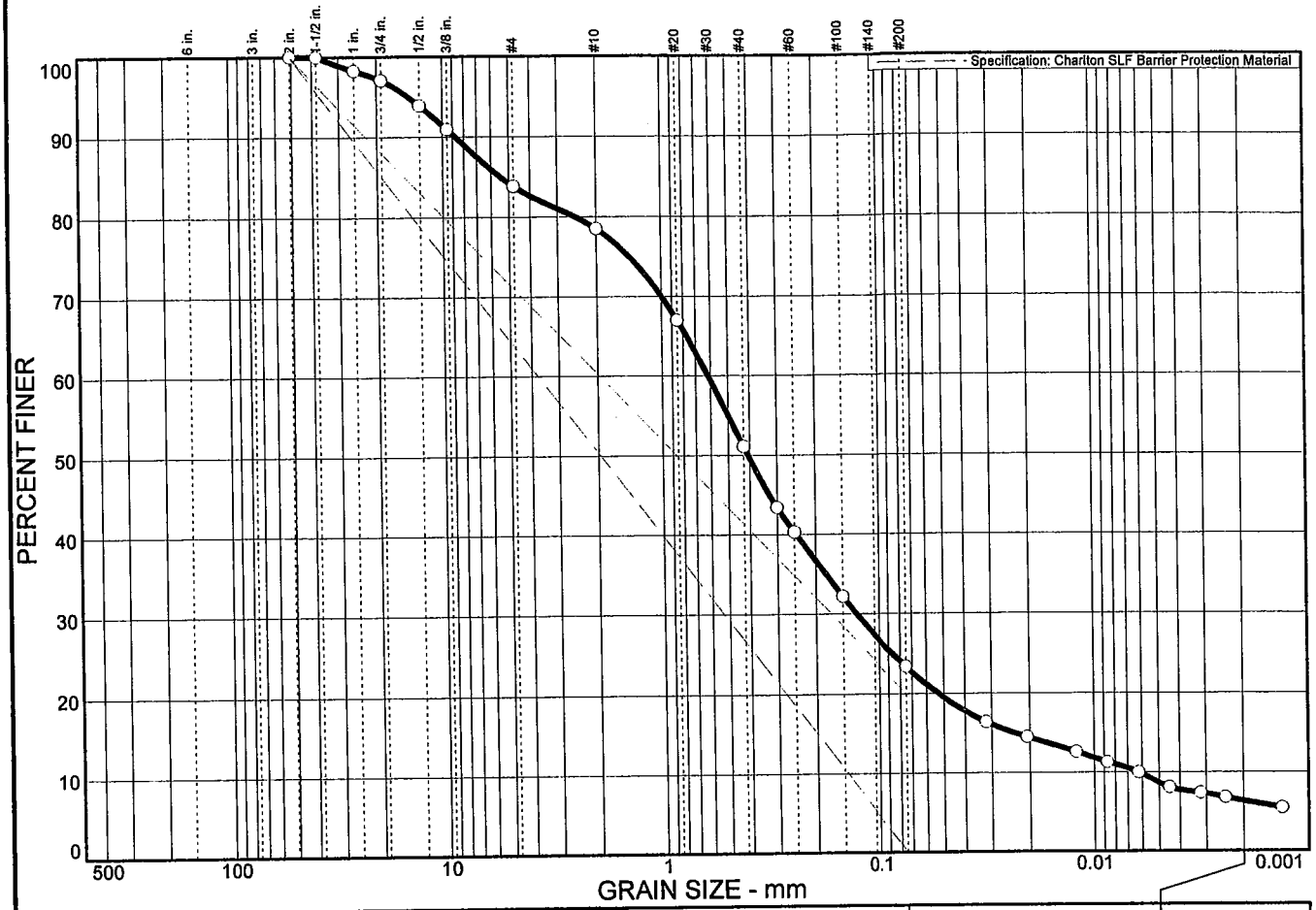
Sample submitted by client on 6/22/11
sample results simialr to previous barrier soils

Sample No.: L-19224 **Source of Sample:** Onsite Barrier Soil **Date:** 6/23/11
Location: Barrier Soil **Elev./Depth:** 12,000 c.y.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	16.2	60.4	17.0	6.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0	100 - 100	✓
1-1/2 in.	100.0		
1 in.	98.3		
3/4 in.	97.1		
1/2 in.	93.9		
3/8 in.	90.9		
#4	83.8		
#10	78.5		
#20	67.0		
#40	51.1		
#50	43.4		
#60	40.3		
#100	32.2		
#200	23.4	0 - 20	X OK

* Charlton SLF Barrier Protection Material

Soil Description

Dark gray 2" max silty sand little gravel
Silty sand with gravel (fines appeared slightly plastic)
D-1557 proctor = 126.5 pcf @ 9.0% optimum moisture

Atterberg Limits

PL= untested LL= untested PI= untested

Coefficients

D_{85}= 5.47 D_{60}= 0.616 D_{50}= 0.406
D_{30}= 0.129 D_{15}= 0.0235 D_{10}= 0.0062
C_u= 98.97 C_c= 4.32

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

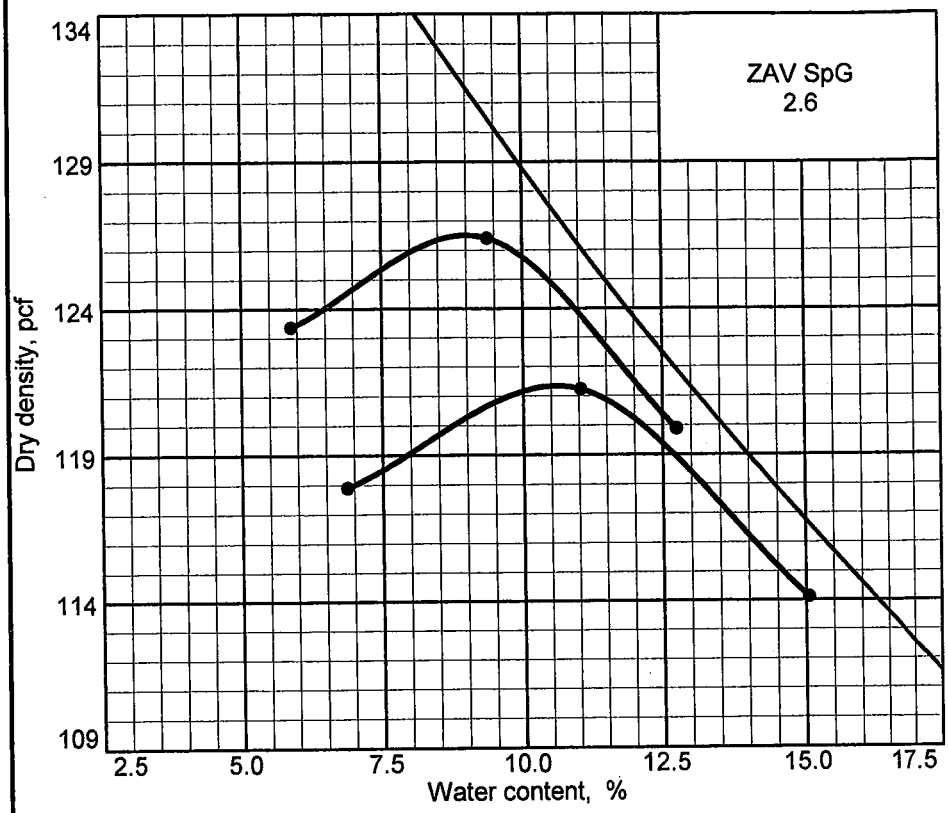
Sample submitted by client on 06/22/11
perm = 1.6 x 10-6 cm/sec (6/24/11 letter)

Sample No.: L-19225 **Source of Sample:** Onsite Barrier Soil **Date:** 6/24/11
Location: Barrier Soil **Elev./Depth:** 13,500 c.y.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

COMPACTION TEST REPORT



Curve No.
L-19225

Test Specification:
ASTM D-1557 Method A (corrected) Mod.
Oversize correction applied to each point

Hammer Wt.: 10
Hammer Drop: 18
Number of Layers: 5
Blows per Layer: 25
Mold Size: .03333 cu.ft.

Test Performed on Material Passing No.4 **Sieve**

Soil Data

NM _____ **Sp.G.** _____
LL untested **PI** untested
%>No.4 16.2 **%<#200** 23.4
USCS SM **AASHTO** A-2-4(0)

TESTING DATA

	1	2	3	4	5	6
WM + WS	6135.0	6265.0	6215.0			
WM	4230.0	4230.0	4230.0			
WW + T #1	61.20	62.10	64.10			
WD + T #1	57.90	56.80	57.00			
TARE #1	11.60	12.40	12.30			
WW + T #2	61.30	62.20	62.80			
WD + T #2	58.10	57.60	56.60			
TARE #2	9.80	12.20	13.00			
MOISTURE	5.9	9.4	12.7			
DRY DENSITY	123.4	126.4	119.9			

ROCK CORRECTED TEST RESULTS

Maximum dry density = 126.5 pcf

Optimum moisture = 9.0 %

Material Description

Dark gray 2" max silty sand little gravel
Silty sand with gravel (fines appeared slightly plastic)
D-1557 proctor = 126.5 pcf @ 9.0% optimum

Project No. 11015 **Client:** J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
• **Location:** Barrier Soil

Remarks:

COMPACTION TEST REPORT

YANKEE ENGINEERING & TESTING, INC.

YANKEE ENGINEERING & TESTING, INC.

June 24, 2011

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton, MA 01510

RE: 13,500 c.y. "Barrier Soil" Test Results
Charlton S.L.F.
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

The purpose of this letter is to present the results of lab tests on sample #**L-19225**, submitted June 22nd 2011, and stated to represent the "13500 cy onsite barrier soil". Testing consisted of a gradation/hydrometer (per ASTM D-422) analysis, modified moisture/density (proctor) relationship, and a one (1) point triaxial cell permeability test. The soil permeability was measured using ASTM D-5084 ("triaxial") instead of ASTM D2434 ("constant head") method as the 23% silt/clay content far exceeded the 10% maximum allowable for ASTM D-2434. The soil, for use as "barrier soil", was specified to have a maximum hydraulic conductivity (permeability) of 1.0×10^{-4} cm/sec.

The gradation/hydrometer/atterberg results classified the soil as a dark gray SM: silty sand with gravel. The soil's maximum dry density (proctor value) was determined to be 126.5 pcf, at 9.0% optimum moisture content, in accordance with ASTM D-1557. The curves associated with these tests are shown on the attached data sheets. An Atterberg limits test was not requested or performed, however, the soil fines did appear "slightly plastic" during laboratory handling/testing indicating limited "clayeyness".

The soil specimen for testing was compacted into a nominal 1/50 cubic foot mold in six lifts using a 5.5 lb. hammer falling twelve inches. The number of blows on each layer was determined by trial and error until the resulting dry density was about 90% of the soil's maximum dry density. The soil was compacted at a moisture content of 15%, which was about 6% over the "compaction optimum", to simulate expected field conditions.

It should be noted that the measured dry density of the specimen was determined using the physical dimensions as measured in the laboratory. A ruler, circumference gauge, and digital balance were used to determine the volume and density of the test specimen. There are slight deficiencies inherent in determining the dry density in this manner, as the specimen ends may not be trimmed to form the exact shape of a right circular cylinder.

The specimen was sealed in a membrane and subjected to confining pressure and initial vacuum pressures that were applied to achieve a minimum 95% saturation level. Once theoretical saturation was noted, the permeability coefficient was measured by monitoring the inflow/outflow volumes. The Table below summarizes the permeability test conditions:

Sample I.D.	Test Cell No. #	Cell Pressure (psi)	Head pressure (psi)	Back Pressure (psi)	Confining Stress (psi)	Hydraulic Gradient
L-19225	1	75	70	65	10	34.3

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

June 24, 2011 (2)

Mr. John Bates
J. Bates & Son, LLC

RE: 13,500 c.y. "Barrier Soil" Test Results
Charlton S.L.F.
Charlton, Massachusetts

Project # 11015

Triaxial Permeability Test Data Summary
Sample #L-19225 Source: Onsite "13,500 c.y. Barrier Soil"

Preparation: Laboratory Compacted Lifts
Notes: Specimen prepared at a moisture content of 15%± that was slightly higher than the 9% compaction optimum, which resulted in 90%± compaction.

INITIAL SPECIMEN CONDITIONS			FINAL SPECIMEN CONDITIONS		
Diameter	(cm.)	7.14	**Diameter**	(cm.)	7.16
Length	(cm.)	10.00	**Length**	(cm.)	9.84
L/D Ratio	n/a	1.40	**L/D Ratio**	n/a	1.37
Moisture Content	(%)	14.6	**Moisture Content**	(%)	17.1
Wet Density	(pcf)	129.5	**Wet Density**	(pcf)	132.8
Dry Density	(pcf)	113.0	**Dry Density**	(pcf)	113.4
Max Dry Density	(pcf)	126.5	**Max Dry Density**	(pcf)	126.5
Compaction	(%)	89.3%	**Compaction**	(%)	89.7%

Hydraulic ("permeability") Conductivity (cm/sec): 1.6×10^{-6} cm/sec ✓

It should be noted that the small differences between initial and final specimen conditions may be attributed to the methods used to measure the specimen, which may not be an exact right circular cylinder.

Based on the above result, the proposed soil met the required 1.0×10^{-4} cm/sec maximum permeability when compacted to 90%± of its maximum dry density. However, it should also be noted that the permeability of cohesive soils is inversely related to the degree of compaction, as well as, the molded moisture content. Thus, specimens prepared at lower compaction and/or moisture contents would tend to show higher/faster permeability rates.

We appreciate this opportunity to be of assistance. Should you have questions, or require additional testing services, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J. Parker, P.E.
Director of Testing Services
WJP:rap
enc.
cc: Mr. Chris Czermak/RBS
r:/works/project/10015/19007/19225.barrier.13500.triax.06241

YANKEE ENGINEERING & TESTING, INC.

July 6, 2011

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton, MA 01510

RE: Saturated Direct Shear Test Results
15,000 c.y. Barrier Soil vs. Drainage Net
Charlton S.L.F.
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

We submit attached herewith the result of one (1) saturated Direct Shear Test, completed in accordance with ASTM D-5321 methods, using a 12" x 12" shear box, on the soil vs geocomposite drainage net interface. The internal maximum "friction angle" was calculated based on the normal stress values versus the measured maximum shear stress values. The following Table presents the material and test information.

Soil Sample #L - 19251 **Source: Onsite "Barrier Soil" - 15,000 c.y. Sample**
Soil Description: - SM: Dark gray silty sand little gravel
Membrane: Submitted: Geocomposite Drainage Net
Substrate: Well Compacted Fine Sand
D-1557 Proctor Data: Max. Dry Density = 125.5 pcf Opt Moist. = 9.7%

Test Condition: Dry Density = 113.0 pcf Moisture = 9.7% Compaction = 90%

Applied Normal Stress, lb.	200	400	800
Applied Normal Stress, psi	1.39	2.78	5.56
Maximum Shear Stress, psi	0.90	1.49	3.30
Cohesion (C) Value, psi	0	0	0
Individual Friction Angle	**33.0°**	**28.2°**	**30.7°**

✓

Ave. Friction Angle, from attached graph = 30°

As can be seen above, and on the attached data sheet, the 30° interface friction angle met the stated 26° minimum. Should you have any questions, or if we can be of additional testing assistance, please do not hesitate to contact me at our Worcester office.

Very truly yours,

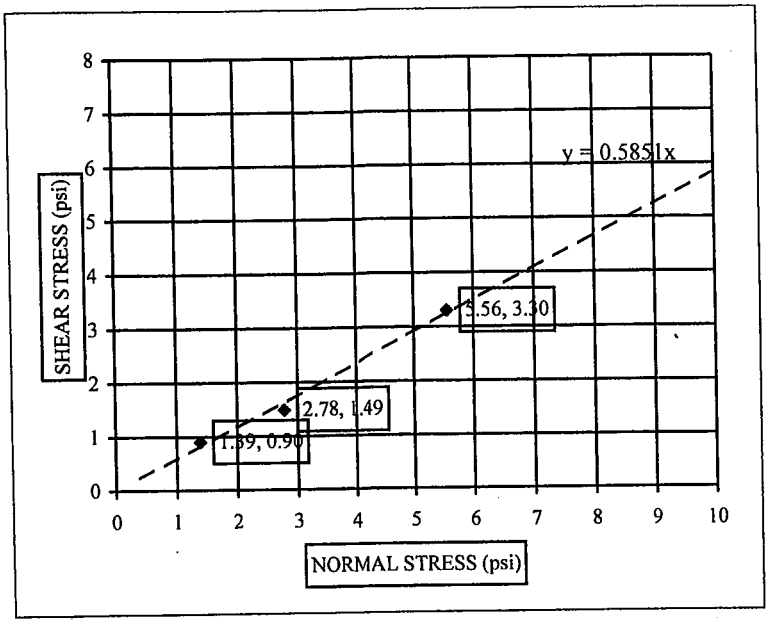
Whitney J. Parker, P.E.
Director of Testing Services
WJP/rap
enc.
cc: Chris Czermak/JBS
r/works/project/11015/19251.shear.barrier.15000.net.07051

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

ASTM D-5321 Soil/Geosynthetic Friction by Direct Shear (Saturated Condition)

Project:	**11015**
Project #:	**Charlton SLF**
Soil ID #:	**L-19251**
Soil Desc:	onsite silty sand some gravel
Membrane:	composite drainage net
Max Dry Density:	125.5 pcf
Optimum Moisture:	9.7 %
Test Dry Density:	113.0 pcf
Wt. of Dry Soil:	17100 grams
% Compaction:	90.0 %
% Moisture:	9.7 %
Shear Rate:	.04 in/min
Shear Correction:	0 psi
Date:	June 30 to July 5, 2011
Tech:	KN/RM/KN/WP

Disp.	#1	#2	#3
0.00	12	18	36
0.05	14	50	70
0.10	26	82	110
0.15	48	110	158
0.20	76	146	216
0.25	98	180	284
0.30	120	182	354
0.35	122	190	432
0.40	128	208	474
0.45	130	212	470
0.50	126	214	448
0.55	126	210	436
0.60	122	202	430
0.65	122	194	422
0.70	118	188	432
0.75	120	192	434
0.80	114	188	420
0.85	110	188	402
0.90	110	182	388
0.95	106	180	380
1.00	102	174	370
1.05	100	168	370
1.10	104	160	380
1.15	100	166	378
1.20	100	160	372
1.25	98	158	366
1.30	96	154	370
1.35	100	154	374
1.40	98	156	370
1.45	100	154	368
1.50	98	156	370

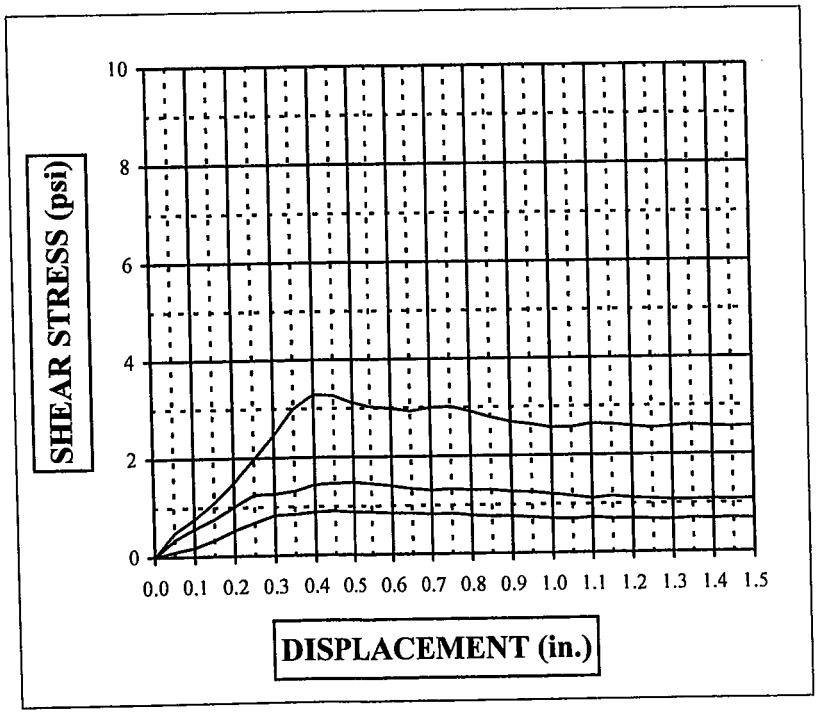


Cohesion (C) = 0 psi

Θ = 30 degrees

Normal Loading #1 = 200 lb. #2 = 400 lb. #3 = 800 lb.

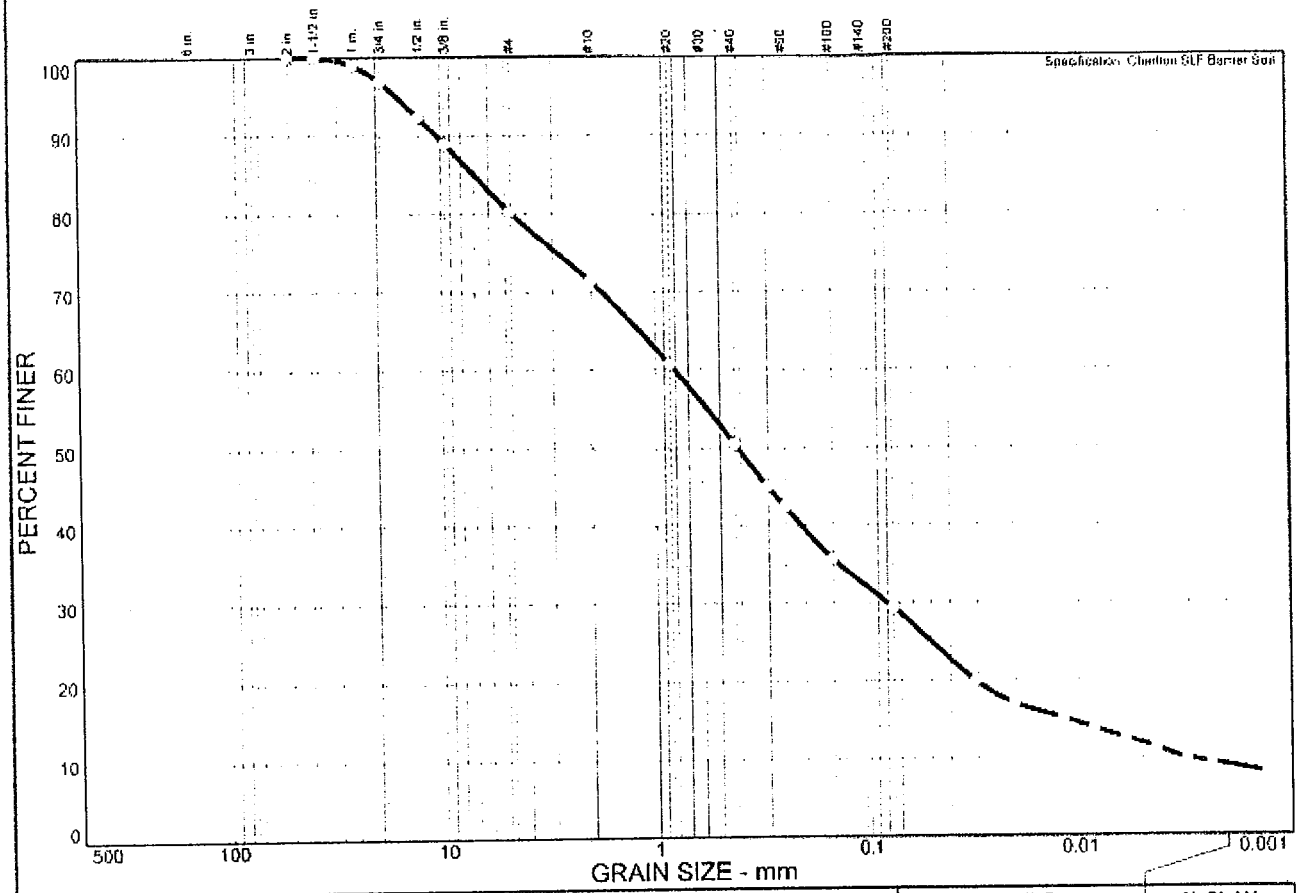
#1	Normal	1.39 psi	Max.	0.90 psi	Residual	0.68 psi
#2	Normal	2.78 psi	Max.	1.49 psi	Residual	1.08 psi
#3	Normal	5.56 psi	Max.	3.30 psi	Residual	2.57 psi



Remarks: Soil vs. geocomposite drainage net interface shear angle was 30° which met the stated 26° minimum.
Refer to letter dated July 6, 2011 for a summary of the shear test data and result.

Yankee Engineering and Testing, Inc.
10 Mason St., Worcester, MA 01609
phone 508-831-7404 fax. 508-831-7388

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	19.7	51.0	20.2	9.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0	100 - 100 ✓	
1-1/2 in.	100.0		
1 in.	99.0		
3/4 in.	96.9		
1/2 in.	92.3		
3/8 in.	88.9		
#4	80.3		
#10	71.4		
#20	60.7		
#40	50.5		
#50	45.0		
#60	42.4		
#100	35.7		
#200	29.3	0 - 20	X ✓ OK

* Charlton SLF Barrier Soil

Soil Description

Dark gray 2" max silty sand little gravel
Silty sand with gravel (fines appeared slightly plastic)
no additional lab tests requested

Atterberg Limits

PL= untested LL= untested PI= untested

Coefficients

D_{85}= 6.97 D_{60}= 0.808 D_{50}= 0.412
D_{30}= 0.0808 D_{15}= 0.0115 D_{10}= 0.0031
C_u= 259.78 C_c= 2.60

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Sample submitted by client (Pete) on 7/6/11
gradation similar to previous barrier soil samples

Sample No.: L-19274 **Source of Sample:** Onsite Barrier Soil **Date:** 7/7/11
Location: Barrier Soil **Elev./Depth:** 16,500 c.y.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

Appendix G

In-place Capping Layer Depth Confirmation

Charlton Landfill Closure Certification
Table G-1
Summary of Depth Confirmation

Barrier Protection Material
12-inch minimum thickness

Test Hole Number	Measured Depth (inches)
1	12.5
2	13
3	12.75
4	12.5
5	12.25
6	13
7	13
8	12.5
9	12.5
10	13
11	12.5
12	13
13	12.5
14	13
15	12
16	13
17	13
18	12.5
19	14
20	12.5
21	13
22	13.5
23	12.5
24	12.5
25	13
26	13
27	12.5
28	13
29	13.5
30	12.5
31	12.5
32	13
33	13
34	13
35	14
36	12.5
37	12
38	12.5
39	12
40	12.5
41	13
42	13.5
43	12
44	13
45	12.5
46	13
47	13.5
48	14

Total Test Holes: 48

Charlton Landfill Closure Certification
Table G-2
Summary of Depth Confirmation

Topsoil
6-inch minimum thickness

Test Hole Number	Measured Depth (inches)
1	6
2	6.5
3	6.5
4	7
5	6.5
6	6
7	6.5
8	6.5
9	6.5
10	6.5
11	7
12	6.5
13	6
14	6.5
15	7
16	6.5
17	7
18	7
19	6.5
20	6.5
21	6
22	6
23	7
24	6.5
25	6.5
26	break in numbering sequence
27	
28	
29	
30	
31	
32	
33	
34	6.75
35	7
36	7
37	6.75
38	7
39	7
40	6.5
41	6.5
42	7
43	6.25
44	7
45	6.5
46	7
47	7
48	7

Total Test Holes: 40

BPM - 12"

NO. 1 - 12.5"
NO.2 - 13.0"
NO.3 - 12.75"
NO.4 - 12.50"
NO.5 - 12.25"
NO.6 - 13.00
NO.7 - 13.00
NO.8 - 12.50
NO.9 - 12.50
NO.10 - 13.00
NO.11 - 12.50
NO.12 - 13.00
NO.13 - 12.50
NO.14 - 13.00
NO.15 - 12.00
NO.16 - 13.00
NO.17 - 13.00
NO.18 - 12.50
NO.19 - 14.00
NO.20 - 12.50
NO.21 - 13.00
NO.22 - 13.50
NO.23 - 12.50
NO.24 - 12.50
NO.25 - 13.00
NO.26 - 13.00
NO.27 - 12.50
NO.28 - 13.00
NO.29 - 13.50
NO.30 - 12.50
NO.31 - 12.50
NO.32 - 13.00
NO.33 - 13.00

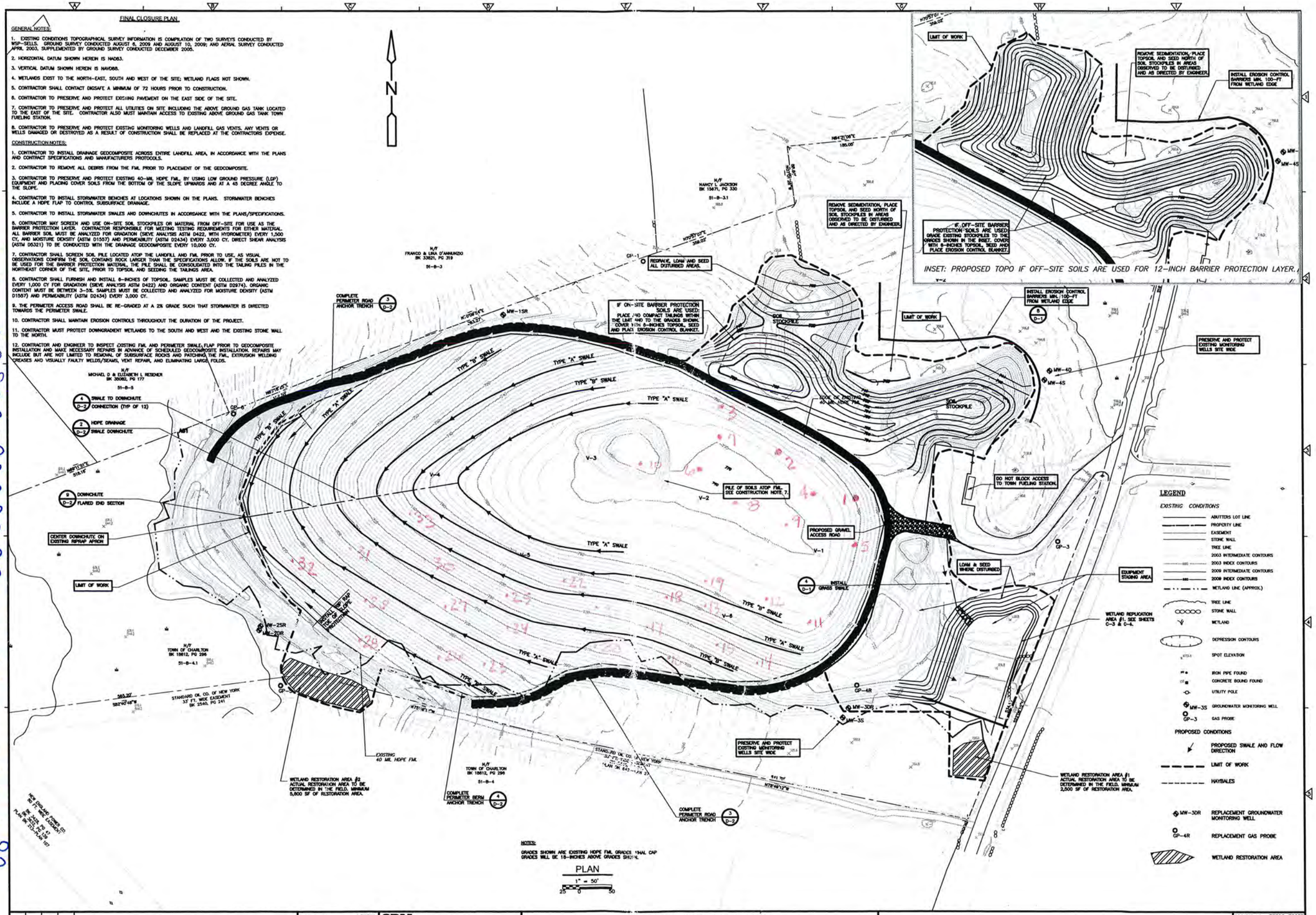
FINAL CLOSURE PLAN

GENERAL NOTES:

1. EXISTING CONDITIONS TOPOGRAPHICAL SURVEY INFORMATION IS COMPILATION OF TWO SURVEYS CONDUCTED BY WSP-SELLS. GROUND SURVEY CONDUCTED AUGUST 6, 2009 AND AUGUST 10, 2009; AND AERIAL SURVEY CONDUCTED APRIL 2003, SUPPLEMENTED BY GROUND SURVEY CONDUCTED DECEMBER 2005.
2. HORIZONTAL DATUM SHOWN HEREIN IS NAD83.
3. VERTICAL DATUM SHOWN HEREIN IS NAVD88.
4. WETLANDS EXIST TO THE NORTH-EAST, SOUTH AND WEST OF THE SITE; WETLAND FLAGS NOT SHOWN.
5. CONTRACTOR SHALL CONTACT DIGSAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
6. CONTRACTOR TO PRESERVE AND PROTECT EXISTING PAVEMENT ON THE EAST SIDE OF THE SITE.
7. CONTRACTOR TO PRESERVE AND PROTECT ALL UTILITIES ON SITE INCLUDING THE ABOVE GROUND GAS TANK LOCATED TO THE EAST OF THE SITE. CONTRACTOR ALSO MUST MAINTAIN ACCESS TO EXISTING ABOVE GROUND GAS TANK TOWN FUELING STATION.
8. CONTRACTOR TO PRESERVE AND PROTECT EXISTING MONITORING WELLS AND LANDFILL GAS VENTS. ANY VENTS OR WELLS DAMAGED OR DESTROYED AS A RESULT OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

CONSTRUCTION NOTES:

1. CONTRACTOR TO INSTALL DRAINAGE GEOCOMPOSITE ACROSS ENTIRE LANDFILL AREA, IN ACCORDANCE WITH THE PLANS AND CONTRACT SPECIFICATIONS AND MANUFACTURERS PROTOCOLS.
2. CONTRACTOR TO REMOVE ALL DEBRIS FROM THE FML PRIOR TO PLACEMENT OF THE GEOCOMPOSITE.
3. CONTRACTOR TO PRESERVE AND PROTECT EXISTING 40-MIL HDPE FML, BY USING LOW GROUND PRESSURE (LGP) EQUIPMENT AND PLACING COVER SOILS FROM THE BOTTOM OF THE SLOPE UPWARDS AND AT A 45 DEGREE ANGLE TO THE SLOPE.
4. CONTRACTOR TO INSTALL STORMWATER BENCHES AT LOCATIONS SHOWN ON THE PLANS. STORMWATER BENCHES INCLUDE A HDPE FLAP TO CONTROL SUBSURFACE DRAINAGE.
5. CONTRACTOR TO INSTALL STORMWATER SWALES AND DOWNCHUTES IN ACCORDANCE WITH THE PLANS/SPECIFICATIONS.
6. CONTRACTOR MAY SCREEN AND USE ON-SITE SOIL STOCKPILES OR MATERIAL FROM OFF-SITE FOR USE AS THE BARRIER PROTECTION LAYER. CONTRACTOR RESPONSIBLE FOR MEETING TESTING REQUIREMENTS FOR EITHER MATERIAL. ALL BARRIER SOIL MUST BE ANALYZED FOR GRADATION (SIEVE ANALYSIS ASTM D422, WITH HYDROMETER) EVERY 1,500 CY, AND MOISTURE DENSITY (ASTM D1557) AND PERMEABILITY (ASTM D2434) EVERY 3,000 CY. DIRECT SHEAR ANALYSIS (ASTM D5321) TO BE CONDUCTED WITH THE DRAINAGE GEOCOMPOSITE EVERY 10,000 CY.
7. CONTRACTOR SHALL SCREEN SOIL PILE LOCATED ATOP THE LANDFILL AND FML PRIOR TO USE, AS VISUAL OBSERVATIONS CONFIRM THE SOIL CONTAINS ROCK LARGER THAN THE SPECIFICATIONS ALLOW. IF THE SOILS ARE NOT TO BE USED FOR THE BARRIER PROTECTION MATERIAL, THE PILE SHALL BE CONSOLIDATED INTO THE TAILING PILES IN THE NORTHEAST CORNER OF THE SITE, PRIOR TO TOPSOIL AND SEEDING THE TAILINGS AREA.
8. CONTRACTOR SHALL FURNISH AND INSTALL 6-INCHES OF TOPSOIL. SAMPLES MUST BE COLLECTED AND ANALYZED EVERY 1,000 CY FOR GRADATION (SIEVE ANALYSIS ASTM D422) AND ORGANIC CONTENT (ASTM D2974). ORGANIC CONTENT MUST BE BETWEEN 3-5%. SAMPLES MUST BE COLLECTED AND ANALYZED FOR MOISTURE DENSITY (ASTM D1557) AND PERMEABILITY (ASTM D2434) EVERY 3,000 CY.
9. THE PERIMETER ACCESS ROAD SHALL BE RE-GRADED AT A 2% GRADE SUCH THAT STORMWATER IS DIRECTED TOWARDS THE PERIMETER SWALE.
10. CONTRACTOR SHALL MAINTAIN EROSION CONTROLS THROUGHOUT THE DURATION OF THE PROJECT.
11. CONTRACTOR MUST PROTECT DOWNGRADIENT WETLANDS TO THE SOUTH AND WEST AND THE EXISTING STONE WALL TO THE NORTH.
12. CONTRACTOR AND ENGINEER TO INSPECT EXISTING FML AND PERIMETER SWALE, FLAP PRIOR TO GEOCOMPOSITE INSTALLATION AND MAKE NECESSARY REPAIRS IN ADVANCE OF SCHEDULED GEOCOMPOSITE INSTALLATION. REPAIRS MAY INCLUDE BUT ARE NOT LIMITED TO REMOVAL OF SUBSURFACE ROCKS AND PATCHING THE FML, EXTRUSION WELDING CREASES AND VISUALLY FAULTY WELDS/SEAMS, VENT REPAIR, AND ELIMINATING LARGE FOLDS.



NOTES:
GRADES SHOWN ARE EXISTING HDPE FML GRADES 1FNAL CAP GRADES WILL BE 18-INCHES ABOVE GRADES SHOWN.

PLAN
1" = 50'
25 0 50

REV. NO.	DATE	DRAWN	CHKD	REMARKS

DESIGNED BY: L.BUGAY
DRAWN BY: L. BUGAY
SHEET CHK'D BY: B.HASKELL
CROSS CHK'D BY:
APPROVED BY: B. HASKELL
DATE: SEPTEMBER 2010

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02138
Tel: (617) 452-6000
consulting • engineering • construction • operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH
LANDFILL CLOSURE PROJECT

LANDFILL CLOSURE PLAN

PROJECT NO. 75398-72037
FILE NAME: CSTPL004
SHEET NO. C-2

DEPTH CONFIRMATION PLAN - BPM (12")

BPM - 12"

No. 34 - 13.0"
No. 35 - 14.00"
No. 36 - 12.50"
No. 37 - 12.00"
No. 38 - 12.50"
No. 39 - 12.00"
No. 40 - 12.50"
No. 41 - 13.00"
No. 42 - 13.50"
No. 43 - 12.00"
No. 44 - 13.00"
No. 45 - 12.50"
No. 46 - 13.00"
No. 47 - 13.50"
No. 48 - 14.00"

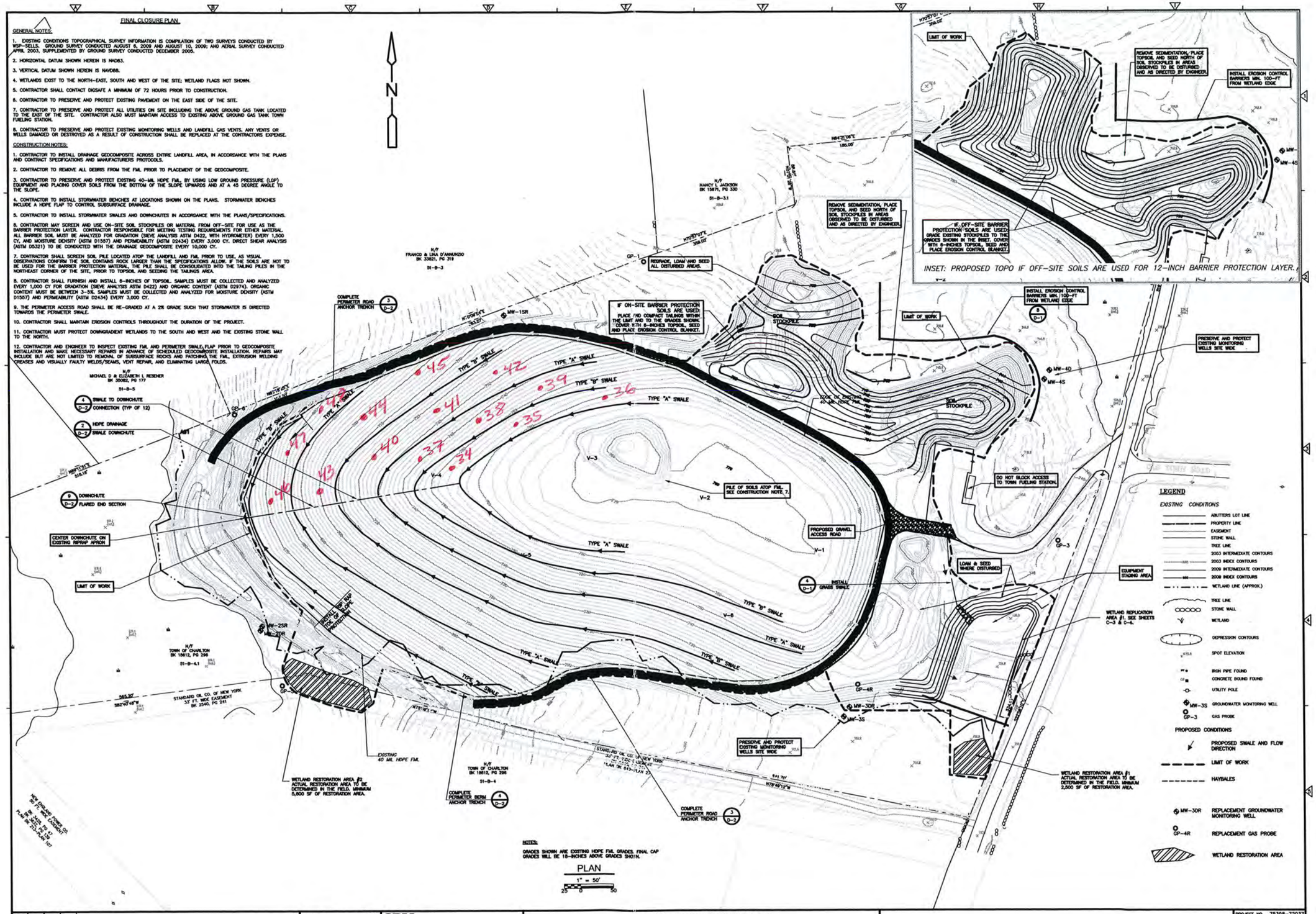
FINAL CLOSURE PLAN

GENERAL NOTES:

1. EXISTING CONDITIONS TOPOGRAPHICAL SURVEY INFORMATION IS COMPILATION OF TWO SURVEYS CONDUCTED BY WSP-SELLS. GROUND SURVEY CONDUCTED AUGUST 6, 2009 AND AUGUST 10, 2009; AND AERIAL SURVEY CONDUCTED APRIL 2003, SUPPLEMENTED BY GROUND SURVEY CONDUCTED DECEMBER 2005.
2. HORIZONTAL DATUM SHOWN HEREIN IS NAD83.
3. VERTICAL DATUM SHOWN HEREIN IS NAVD88.
4. WETLANDS EXIST TO THE NORTH-EAST, SOUTH AND WEST OF THE SITE; WETLAND FLAGS NOT SHOWN.
5. CONTRACTOR SHALL CONTACT DIGSAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
6. CONTRACTOR TO PRESERVE AND PROTECT EXISTING PAVEMENT ON THE EAST SIDE OF THE SITE.
7. CONTRACTOR TO PRESERVE AND PROTECT ALL UTILITIES ON SITE INCLUDING THE ABOVE GROUND GAS TANK LOCATED TO THE EAST OF THE SITE. CONTRACTOR ALSO MUST MAINTAIN ACCESS TO EXISTING ABOVE GROUND GAS TANK TOWN FUELING STATION.
8. CONTRACTOR TO PRESERVE AND PROTECT EXISTING MONITORING WELLS AND LANDFILL GAS VENTS. ANY VENTS OR WELLS DAMAGED OR DESTROYED AS A RESULT OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

CONSTRUCTION NOTES:

1. CONTRACTOR TO INSTALL DRAINAGE GEOCOMPOSITE ACROSS ENTIRE LANDFILL AREA, IN ACCORDANCE WITH THE PLANS AND CONTRACT SPECIFICATIONS AND MANUFACTURERS PROTOCOLS.
2. CONTRACTOR TO REMOVE ALL DEBRIS FROM THE FML PRIOR TO PLACEMENT OF THE GEOCOMPOSITE.
3. CONTRACTOR TO PRESERVE AND PROTECT EXISTING 40-MIL HDPE FML, BY USING LOW GROUND PRESSURE (LGP) EQUIPMENT AND PLACING COVER SOILS FROM THE BOTTOM OF THE SLOPE UPWARDS AND AT A 45 DEGREE ANGLE TO THE SLOPE.
4. CONTRACTOR TO INSTALL STORMWATER BENCHES AT LOCATIONS SHOWN ON THE PLANS. STORMWATER BENCHES INCLUDE A HDPE FLAP TO CONTROL SUBSURFACE DRAINAGE.
5. CONTRACTOR TO INSTALL STORMWATER SWALES AND DOWNCHUTES IN ACCORDANCE WITH THE PLANS/SPECIFICATIONS.
6. CONTRACTOR MAY SCREEN AND USE ON-SITE SOIL STOCKPILES OR MATERIAL FROM OFF-SITE FOR USE AS THE BARRIER PROTECTION LAYER. CONTRACTOR RESPONSIBLE FOR MEETING TESTING REQUIREMENTS FOR EITHER MATERIAL. ALL BARRIER SOIL MUST BE ANALYZED FOR GRADATION (SIEVE ANALYSIS ASTM D422, WITH HYDROMETER) EVERY 1,500 CY, AND MOISTURE DENSITY (ASTM D1557) AND PERMEABILITY (ASTM D2434) EVERY 3,000 CY. DIRECT SHEAR ANALYSIS (ASTM D5321) TO BE CONDUCTED WITH THE DRAINAGE GEOCOMPOSITE EVERY 10,000 CY.
7. CONTRACTOR SHALL SCREEN SOIL PILE LOCATED ATOP THE LANDFILL AND FML PRIOR TO USE, AS VISUAL OBSERVATIONS CONFIRM THE SOIL CONTAINS ROCK LARGER THAN THE SPECIFICATIONS ALLOW. IF THE SOILS ARE NOT TO BE USED FOR THE BARRIER PROTECTION MATERIAL, THE PILE SHALL BE CONSOLIDATED INTO THE TAILING PILES IN THE NORTHEAST CORNER OF THE SITE, PRIOR TO TOPSOIL AND SEEDING THE TAILINGS AREA.
8. CONTRACTOR SHALL FURNISH AND INSTALL 6-INCHES OF TOPSOIL. SAMPLES MUST BE COLLECTED AND ANALYZED EVERY 1,000 CY FOR GRADATION (SIEVE ANALYSIS ASTM D422) AND ORGANIC CONTENT (ASTM D2974). ORGANIC CONTENT MUST BE BETWEEN 3-5%. SAMPLES MUST BE COLLECTED AND ANALYZED FOR MOISTURE DENSITY (ASTM D1557) AND PERMEABILITY (ASTM D2434) EVERY 3,000 CY.
9. THE PERIMETER ACCESS ROAD SHALL BE RE-GRADED AT A 2% GRADE SUCH THAT STORMWATER IS DIRECTED TOWARDS THE PERIMETER SWALE.
10. CONTRACTOR SHALL MAINTAIN EROSION CONTROLS THROUGHOUT THE DURATION OF THE PROJECT.
11. CONTRACTOR MUST PROTECT DOWNGRADIENT WETLANDS TO THE SOUTH AND WEST AND THE EXISTING STONE WALL TO THE NORTH.
12. CONTRACTOR AND ENGINEER TO INSPECT EXISTING FML AND PERIMETER SWALE/FLAP PRIOR TO GEOCOMPOSITE INSTALLATION AND MAKE NECESSARY REPAIRS IN ADVANCE OF SCHEDULED GEOCOMPOSITE INSTALLATION. REPAIRS MAY INCLUDE BUT ARE NOT LIMITED TO REMOVAL OF SUBSURFACE ROCKS AND PATCHING THE FML, EXTRUSION WELDING CREASES AND VISUALLY FAULTY WELDS/SEAMS, VENT REPAIR, AND ELIMINATING LARGE FOLDS.



NOTES:
GRADES SHOWN ARE EXISTING HDPE FML GRADES. FINAL CAP GRADES WILL BE 18-INCHES ABOVE GRADES SHOWN.

PLAN
1" = 50'
25 0 50

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: L.BUGAY
DRAWN BY: L. BUGAY
SHEET CHK'D BY: B.HASKELL
CROSS CHK'D BY:
APPROVED BY: B. HASKELL
DATE: SEPTEMBER 2010

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting · engineering · construction · operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH
LANDFILL CLOSURE PROJECT

LANDFILL CLOSURE PLAN

PROJECT NO. 75398-72037
FILE NAME: CSTPL004
SHEET NO. C-2

DEPTH CONFIRMATION PLAN - BPM (12")

TOPSOIL (6")

#1 6"
#2 6.5"
#3 6.5"
#4 7"
#5 6.5"
#6 6"
#7 6.5"
#8 6.5"
#9 6.5"
#10 6.5"
#11 7"
#12 6.5"
#13 6"
#14 6.5"
#15 7"
#16 6.5"
#17 7"
#18 7"
#19 6.5"
#20 6.5"
#21 6."
#22 6"
#23 7"
#24 6.5"
#25 6.5"

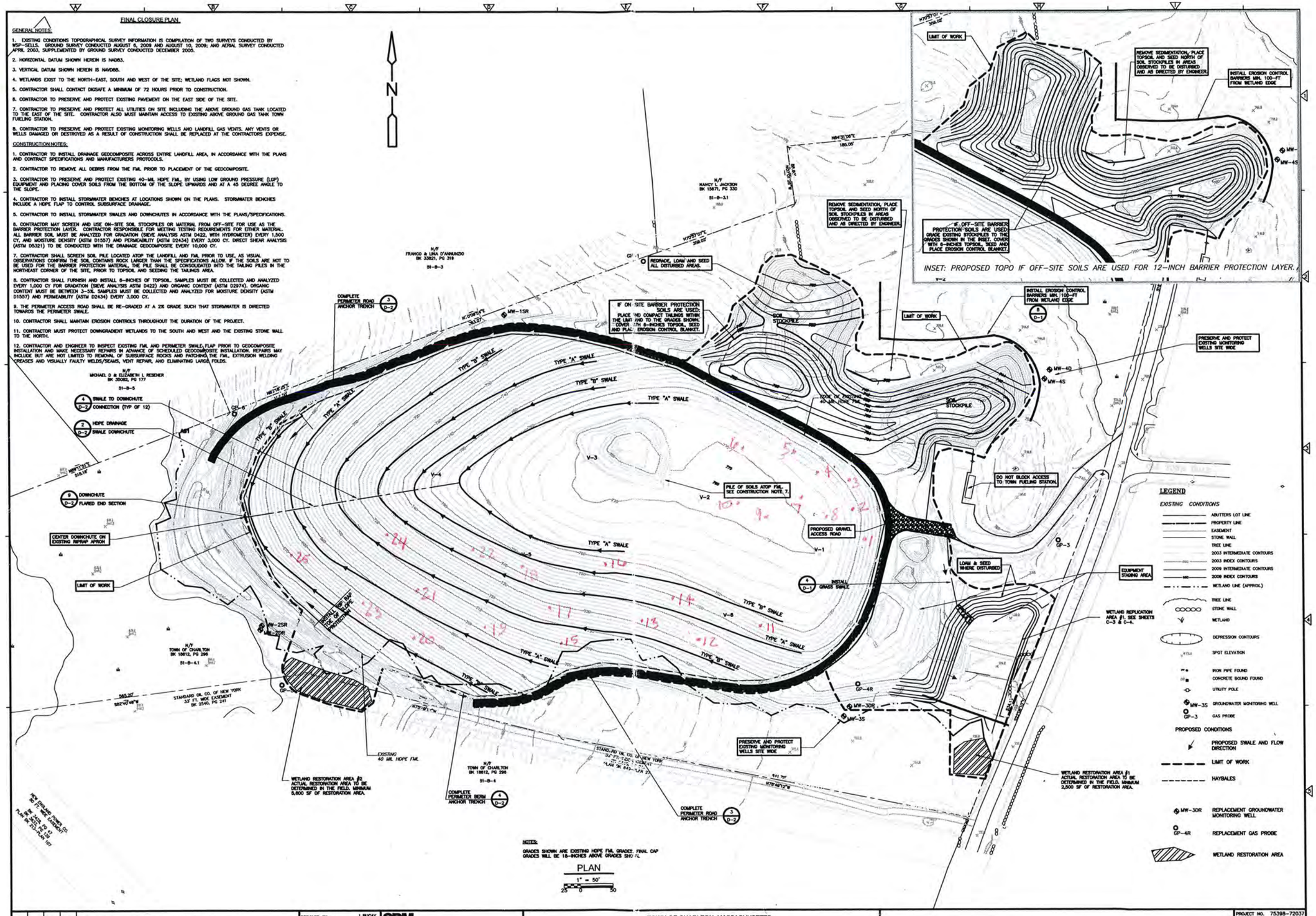
FINAL CLOSURE PLAN

GENERAL NOTES:

1. EXISTING CONDITIONS TOPOGRAPHICAL SURVEY INFORMATION IS COMPILATION OF TWO SURVEYS CONDUCTED BY WSP-SELLS. GROUND SURVEY CONDUCTED AUGUST 6, 2009 AND AUGUST 10, 2009; AND AERIAL SURVEY CONDUCTED APRIL 2003, SUPPLEMENTED BY GROUND SURVEY CONDUCTED DECEMBER 2005.
2. HORIZONTAL DATUM SHOWN HEREIN IS NAD83.
3. VERTICAL DATUM SHOWN HEREIN IS NAVD88.
4. WETLANDS EXIST TO THE NORTH-EAST, SOUTH AND WEST OF THE SITE; WETLAND FLAGS NOT SHOWN.
5. CONTRACTOR SHALL CONTACT DIGSAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
6. CONTRACTOR TO PRESERVE AND PROTECT EXISTING PAVEMENT ON THE EAST SIDE OF THE SITE.
7. CONTRACTOR TO PRESERVE AND PROTECT ALL UTILITIES ON SITE INCLUDING THE ABOVE GROUND GAS TANK LOCATED TO THE EAST OF THE SITE. CONTRACTOR ALSO MUST MAINTAIN ACCESS TO EXISTING ABOVE GROUND GAS TANK TOWN FUELING STATION.
8. CONTRACTOR TO PRESERVE AND PROTECT EXISTING MONITORING WELLS AND LANDFILL GAS VENTS. ANY VENTS OR WELLS DAMAGED OR DESTROYED AS A RESULT OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

CONSTRUCTION NOTES:

1. CONTRACTOR TO INSTALL DRAINAGE GEODCOMPOSITE ACROSS ENTIRE LANDFILL AREA, IN ACCORDANCE WITH THE PLANS AND CONTRACT SPECIFICATIONS AND MANUFACTURERS PROTOCOLS.
2. CONTRACTOR TO REMOVE ALL DEBRIS FROM THE FML PRIOR TO PLACEMENT OF THE GEODCOMPOSITE.
3. CONTRACTOR TO PRESERVE AND PROTECT EXISTING 40-MIL HDPE FML, BY USING LOW GROUND PRESSURE (LGP) EQUIPMENT AND PLACING COVER SOILS FROM THE BOTTOM OF THE SLOPE UPWARDS AND AT A 45 DEGREE ANGLE TO THE SLOPE.
4. CONTRACTOR TO INSTALL STORMWATER BENCHES AT LOCATIONS SHOWN ON THE PLANS. STORMWATER BENCHES INCLUDE A HDPE FLAP TO CONTROL SUBSURFACE DRAINAGE.
5. CONTRACTOR TO INSTALL STORMWATER SWALES AND DOWNCHUTES IN ACCORDANCE WITH THE PLANS/SPECIFICATIONS.
6. CONTRACTOR MAY SCREEN AND USE ON-SITE SOIL STOCKPILES OR MATERIAL FROM OFF-SITE FOR USE AS THE BARRIER PROTECTION LAYER. CONTRACTOR RESPONSIBLE FOR MEETING TESTING REQUIREMENTS FOR EITHER MATERIAL. ALL BARRIER SOIL MUST BE ANALYZED FOR GRADATION (SIEVE ANALYSIS ASTM D422, WITH HYDROMETER) EVERY 1,500 CY, AND MOISTURE DENSITY (ASTM D1557) AND PERMEABILITY (ASTM D2434) EVERY 3,000 CY. DIRECT SHEAR ANALYSIS (ASTM D5321) TO BE CONDUCTED WITH THE DRAINAGE GEODCOMPOSITE EVERY 10,000 CY.
7. CONTRACTOR SHALL SCREEN SOIL PILE LOCATED ATOP THE LANDFILL AND FML PRIOR TO USE, AS VISUAL OBSERVATIONS CONFIRM THE SOIL CONTAINS ROCK LARGER THAN THE SPECIFICATIONS ALLOW. IF THE SOILS ARE NOT TO BE USED FOR THE BARRIER PROTECTION MATERIAL, THE PILE SHALL BE CONSOLIDATED INTO THE TAILING PILES IN THE NORTHEAST CORNER OF THE SITE, PRIOR TO TOPSOIL AND SEEDING THE TAILINGS AREA.
8. CONTRACTOR SHALL FURNISH AND INSTALL 6-INCHES OF TOPSOIL. SAMPLES MUST BE COLLECTED AND ANALYZED EVERY 1,000 CY FOR GRADATION (SIEVE ANALYSIS ASTM D422) AND ORGANIC CONTENT (ASTM D2974). ORGANIC CONTENT MUST BE BETWEEN 3-5%. SAMPLES MUST BE COLLECTED AND ANALYZED FOR MOISTURE DENSITY (ASTM D1557) AND PERMEABILITY (ASTM D2434) EVERY 3,000 CY.
9. THE PERIMETER ACCESS ROAD SHALL BE RE-GRADED AT A 2% GRADE SUCH THAT STORMWATER IS DIRECTED TOWARDS THE PERIMETER SWALE.
10. CONTRACTOR SHALL MAINTAIN EROSION CONTROLS THROUGHOUT THE DURATION OF THE PROJECT.
11. CONTRACTOR MUST PROTECT DOWNGRADIENT WETLANDS TO THE SOUTH AND WEST AND THE EXISTING STONE WALL TO THE NORTH.
12. CONTRACTOR AND ENGINEER TO INSPECT EXISTING FML AND PERIMETER SWALE/FLAP PRIOR TO GEOCOMPOSITE INSTALLATION AND MAKE NECESSARY REPAIRS IN ADVANCE OF SCHEDULED GEOCOMPOSITE INSTALLATION. REPAIRS MAY INCLUDE BUT ARE NOT LIMITED TO REMOVAL OF SUBSURFACE ROCKS AND PATCHING THE FML, EXTRUSION WELDING CREASES AND VISUALLY FAULTY WELDS/SEAMS, VENT REPAIR, AND ELIMINATING LARGE FOLDS.



REV. NO.	DATE	DRAWN	CHK'D	REMARKS

DESIGNED BY: L.BUSAY
DRAWN BY: L. BUSAY
SHEET CHK'D BY: B.HASKELL
CROSS CHK'D BY:
APPROVED BY: B. HASKELL
DATE: SEPTEMBER 2010

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000
consulting · engineering · construction · operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH
LANDFILL CLOSURE PROJECT

LANDFILL CLOSURE PLAN

PROJECT NO. 75398-72037
FILE NAME: CSTPL004
SHEET NO. C-2

DEPTH CONFIRMATION PLAN- TOPSOIL (6")

Topsoil (6")

* BREAK IN NUMBER SEQUENCE SAME LOCATIONS AS BPM CONFIRMAT

No. 34 - 6.75"
No. 35 - 7.00"
No. 36 - 7.00"
No. 37 - 6.75"
No. 38 - 7.00"
No. 39 - 7.00"
No. 40 - 6.50"
No. 41 - 6.50"
No. 42 - 7.00"
No. 43 - 6.25"
No. 44 - 7.00"
No. 45 - 6.50"
No. 46 - 7.00"
No. 47 - 7.00"
No. 48 - 7.00"

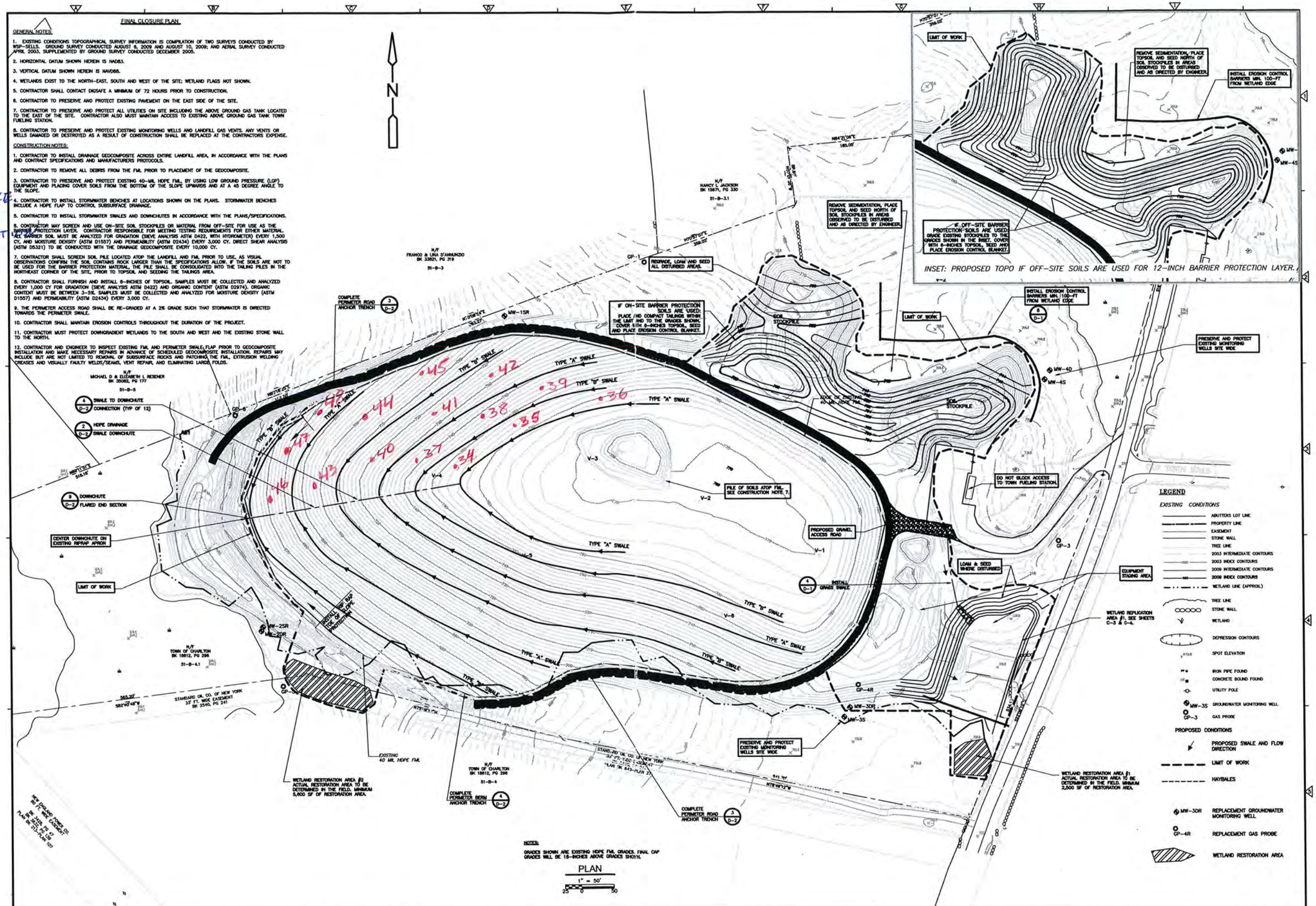
FINAL CLOSURE PLAN

GENERAL NOTES:

1. EXISTING CONDITIONS TOPOGRAPHICAL SURVEY INFORMATION IS COMPILATION OF TWO SURVEYS CONDUCTED BY WSP-SELLS. GROUND SURVEY CONDUCTED AUGUST 6, 2009 AND AUGUST 10, 2009; AND AERIAL SURVEY CONDUCTED APRIL 2003, SUPPLEMENTED BY GROUND SURVEY CONDUCTED DECEMBER 2005.
2. HORIZONTAL DATUM SHOWN HEREIN IS NAD83.
3. VERTICAL DATUM SHOWN HEREIN IS NAVD88.
4. WETLANDS EXIST TO THE NORTH-EAST, SOUTH AND WEST OF THE SITE; WETLAND FLAGS NOT SHOWN.
5. CONTRACTOR SHALL CONTACT DIGSAFE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
6. CONTRACTOR TO PRESERVE AND PROTECT EXISTING PAVEMENT ON THE EAST SIDE OF THE SITE.
7. CONTRACTOR TO PRESERVE AND PROTECT ALL UTILITIES ON SITE INCLUDING THE ABOVE GROUND GAS TANK LOCATED TO THE EAST OF THE SITE. CONTRACTOR ALSO MUST MAINTAIN ACCESS TO EXISTING ABOVE GROUND GAS TANK TOWN FUELING STATION.
8. CONTRACTOR TO PRESERVE AND PROTECT EXISTING MONITORING WELLS AND LANDFILL GAS VENTS. ANY VENTS OR WELLS DAMAGED OR DESTROYED AS A RESULT OF CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

CONSTRUCTION NOTES:

1. CONTRACTOR TO INSTALL DRAINAGE GEOCOMPOSITE ACROSS ENTIRE LANDFILL AREA, IN ACCORDANCE WITH THE PLANS AND CONTRACT SPECIFICATIONS AND MANUFACTURERS PROTOCOLS.
2. CONTRACTOR TO REMOVE ALL DEBRIS FROM THE FML PRIOR TO PLACEMENT OF THE GEOCOMPOSITE.
3. CONTRACTOR TO PRESERVE AND PROTECT EXISTING 40-MIL HDPE FML BY USING LOW GROUND PRESSURE (LGP) EQUIPMENT AND PLACING COVER SOILS FROM THE BOTTOM OF THE SLOPE UPWARDS AND AT A 45 DEGREE ANGLE TO THE SLOPE.
4. CONTRACTOR TO INSTALL STORMWATER BENCHES AT LOCATIONS SHOWN ON THE PLANS. STORMWATER BENCHES INCLUDE A HDPE FLAP TO CONTROL SUBSURFACE DRAINAGE.
5. CONTRACTOR TO INSTALL STORMWATER SWALES AND DOWNCHUTES IN ACCORDANCE WITH THE PLANS/SPECIFICATIONS.
6. CONTRACTOR MAY SCREEN AND USE ON-SITE SOIL STOCKPILES OR MATERIAL FROM OFF-SITE FOR USE AS THE BARRIER PROTECTION LAYER. CONTRACTOR RESPONSIBLE FOR MEETING TESTING REQUIREMENTS FOR EITHER MATERIAL. ALL BARRIER SOIL MUST BE ANALYZED FOR GRADATION (SIEVE ANALYSIS ASTM D422, WITH HYDROMETER) EVERY 1,500 CY, AND MOISTURE DENSITY (ASTM D1557) AND PERMEABILITY (ASTM D2434) EVERY 3,000 CY. DIRECT SHEAR ANALYSIS (ASTM D5321) TO BE CONDUCTED WITH THE DRAINAGE GEOCOMPOSITE EVERY 10,000 CY.
7. CONTRACTOR SHALL SCREEN SOIL PILE LOCATED ATOP THE LANDFILL AND FML PRIOR TO USE, AS VISUAL OBSERVATIONS CONFIRM THE SOIL CONTAINS ROCK LARGER THAN THE SPECIFICATIONS ALLOW. IF THE SOILS ARE NOT TO BE USED FOR THE BARRIER PROTECTION MATERIAL, THE PILE SHALL BE CONSOLIDATED INTO THE TAILING PILES IN THE NORTHEAST CORNER OF THE SITE, PRIOR TO TOPSOIL AND SEEDING THE TAILINGS AREA.
8. CONTRACTOR SHALL FURNISH AND INSTALL 6-INCHES OF TOPSOIL. SAMPLES MUST BE COLLECTED AND ANALYZED EVERY 1,000 CY FOR GRADATION (SIEVE ANALYSIS ASTM D422) AND ORGANIC CONTENT (ASTM D2974). ORGANIC CONTENT MUST BE BETWEEN 3-5%. SAMPLES MUST BE COLLECTED AND ANALYZED FOR MOISTURE DENSITY (ASTM D1557) AND PERMEABILITY (ASTM D2434) EVERY 3,000 CY.
9. THE PERIMETER ACCESS ROAD SHALL BE RE-GRADED AT A 2% GRADE SUCH THAT STORMWATER IS DIRECTED TOWARDS THE PERIMETER SWALE.
10. CONTRACTOR SHALL MAINTAIN EROSION CONTROLS THROUGHOUT THE DURATION OF THE PROJECT.
11. CONTRACTOR MUST PROTECT DOWNGRADIENT WETLANDS TO THE SOUTH AND WEST AND THE EXISTING STONE WALL TO THE NORTH.
12. CONTRACTOR AND ENGINEER TO INSPECT EXISTING FML AND PERIMETER SWALE/FLAP PRIOR TO GEOCOMPOSITE INSTALLATION AND MAKE NECESSARY REPAIRS IN ADVANCE OF SCHEDULED GEOCOMPOSITE INSTALLATION. REPAIRS MAY INCLUDE BUT ARE NOT LIMITED TO REMOVAL OF SUBSURFACE ROCKS AND PATCHING THE FML, EXTRUSION WELDING CREASES AND VISUALLY FAULTY WELDS/SEAMS, VENT REPAIR, AND ELIMINATING LARGE FOLDS.



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: L.BUGAY
DRAWN BY: L. BUGAY
SHEET CHK'D BY: B.HASKELL
CROSS CHK'D BY:
APPROVED BY: B. HASKELL
DATE: SEPTEMBER 2010

CDM
Camp Dresser & McKee Inc.
One Cambridge Place, 50 Hampshire Street
Cambridge, MA 02136
Tel. (617) 452-6000
consulting · engineering · construction · operations

TOWN OF CHARLTON, MASSACHUSETTS
BOARD OF HEALTH
LANDFILL CLOSURE PROJECT

LANDFILL CLOSURE PLAN

PROJECT NO. 75398-72037
FILE NAME: CSTPL004
SHEET NO. C-2

DEPTH CONFIRMATION PLAN TOPSOIL (6")

Appendix H

Topsoil Layer: Source and Conformance Testing

YANKEE ENGINEERING & TESTING, INC.

June 1, 2011

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton, MA 01510

RE: 1:1 Topsoil/Paperfiber Blend Test Results
Charlton SLF
Charlton, Massachusetts
Project # 11015

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro nutrient tests, and an aggregate gradation (to #200) analysis, completed on sample L-19109, submitted on May 26, 2011, and stated to be from Nichols Enterprises. Testing was in accordance with the LaMotte test methods and procedures, while the percent organic was determined by weight loss on incineration. The laboratory test results and general conclusions are listed below:

pH - 6.2 Close to neutral, within the job "topsoil" pH limits of 5.5 to 7.0
Organic Content – 9.8%, high, met the stated job 8% to 10% organic limits
Nitrogen, N (10 lb./acre) low, some additional nitrogen suggested
Phosphorus, P (50 lb./acre) fair, little additional phosphorus suggested
Potash, K (220 lb./acre) good, minimal additional potassium suggested

	Gravel (≥#10)	Sand (#10 to .05)	Silt (<.05 to ≥.002)	Clay* (<.002 mm)
Total Gradation:	31	41	22	6
Sand Fraction:	0	59	32	9

* - due to the limited fines, the clay content was estimated to be about 20% of the weight passing #200 sieve.

USDA Textural (based on 100% < #10) Soil Classification: "Sandy Loam" (met spec)
Observations: Sample was basically free of sticks, roots, and/or stones exceeding 1" and appeared suitable for typical grass growth.

Based on the 6.2 pH, we suggest 500 lb/acre (6 lb./1000 s.f.) of lime be used to raise the pH by about 1 point, and to "sweeten" the soil and improve nutrient absorption. In addition, 500 lb./acre (12 lb./1000 s.f.) of a high nitrogen fertilizer (about 20-10-10) should be applied to achieve and maintain reasonable lawn grass growth.

We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

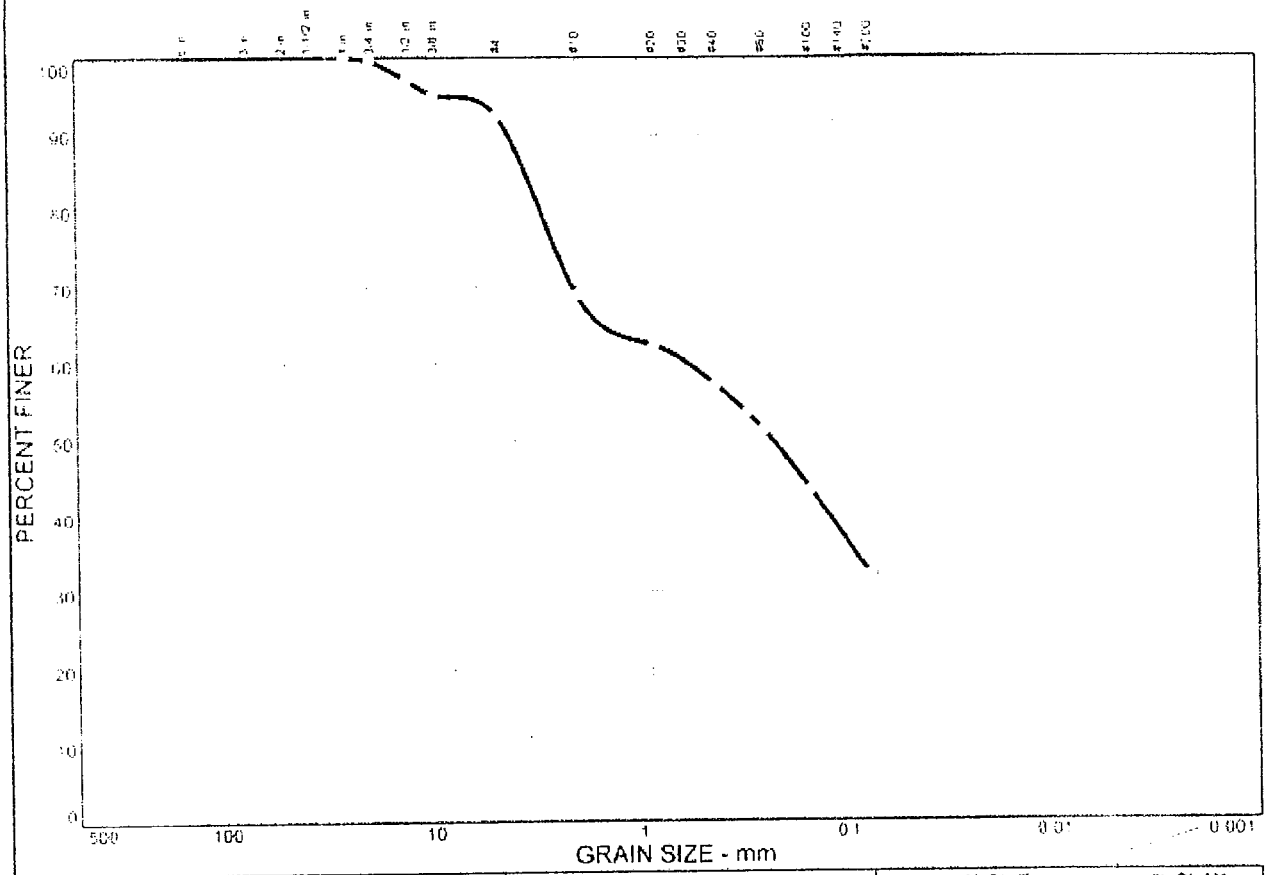
Very truly yours,

Whitney J Parker, P.E.
Director of Testing Services

enc.

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	7.6	60.2	32.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in	100.0		
3/4 in	99.7		
1/2 in.	97.1		
3/8 in.	95.2		
#4	92.4		
#10	68.9		
#20	62.3		
#40	57.1		
#50	53.4		
#60	51.2		
#100	43.4		
#200	32.2		

* (no specification provided)

Soil Description

Light brown silty topsoil/paperfiber blend trace gravel
USDA Textural Classification Sandy Loam

Atterberg Limits

PL= n/a LL= n/a PI= n/a

Coefficients

D_{85}= 3.48 D_{60}= 0.584 D_{50}= 0.229
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= topsoil/fiber AASHTO= topsoil/fiber

Remarks

Sample submitted by client (Pete) on 5/26/11
See letter dated 6/1/11 for additional information

Sample No.: L-19109 **Source of Sample:** Nichols Enterprises **Date:** 6/1/11
Location: Topsoil Blend (1 soil:1 paperfiber) **Elev./Depth:** submitted

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

YANKEE ENGINEERING & TESTING, INC.

June 16, 2011

Mr. John Bates
J. Bates & Son, LLC
474 Main Street
Clinton, MA 01510

RE: Topsoil/Paperfiber 2000 c.y. Test Results
Charlton SLF Closure
Charlton, Massachusetts **Project # 26023**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro nutrient tests, and an aggregate gradation (ASTM D-422 to #200) analysis, completed on sample **L-19191,** submitted on June 16th 2011. Testing was in accordance with the LaMotte test methods and procedures, while the organic content was determined by weight loss on incineration. The laboratory test results and general conclusions are listed below:

pH – 7.8 Moderately basic, pH higher than State M1.05.0 "loam borrow" limits of 5.5 to 7.0
Organic Content – 9.8%, high, within M1.05.0 loam borrow limits of 4%-20%
Nitrogen, N (10 lb./acre) low, some additional nitrogen suggested
Phosphorus, P (200 lb./acre) good, minimal additional phosphorus suggested
Potash, K (200 lb./acre) fair, little additional potassium suggested

	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >.002)	Clay*(<.002 mm)
Total Gradation:	26	48	20	6
Sand Fraction:	0	65	27	8

* - due to the limited fines, the clay content was estimated to be about 20% of the weight passing #200 sieve.

USDA Textural (based on 100% < #10) Soil Classification = Sandy Loam
Observations: Sample was basically free of sticks, roots, and/or stones exceeding 2" and appeared suitable for typical grass growth.

Based on the high (7.8) pH, we suggest that about 1000 lb. per acre (25 lb./1000 s.f.) of "sulfur chips" be added to bring the pH "down about 1 point". Also, we believe that it would be beneficial to add 500± lb./acre (12 lb./1000 s.f.) of a high nitrogen fertilizer (about 20-10-10) to achieve and maintain reasonable lawn grass growth.

We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

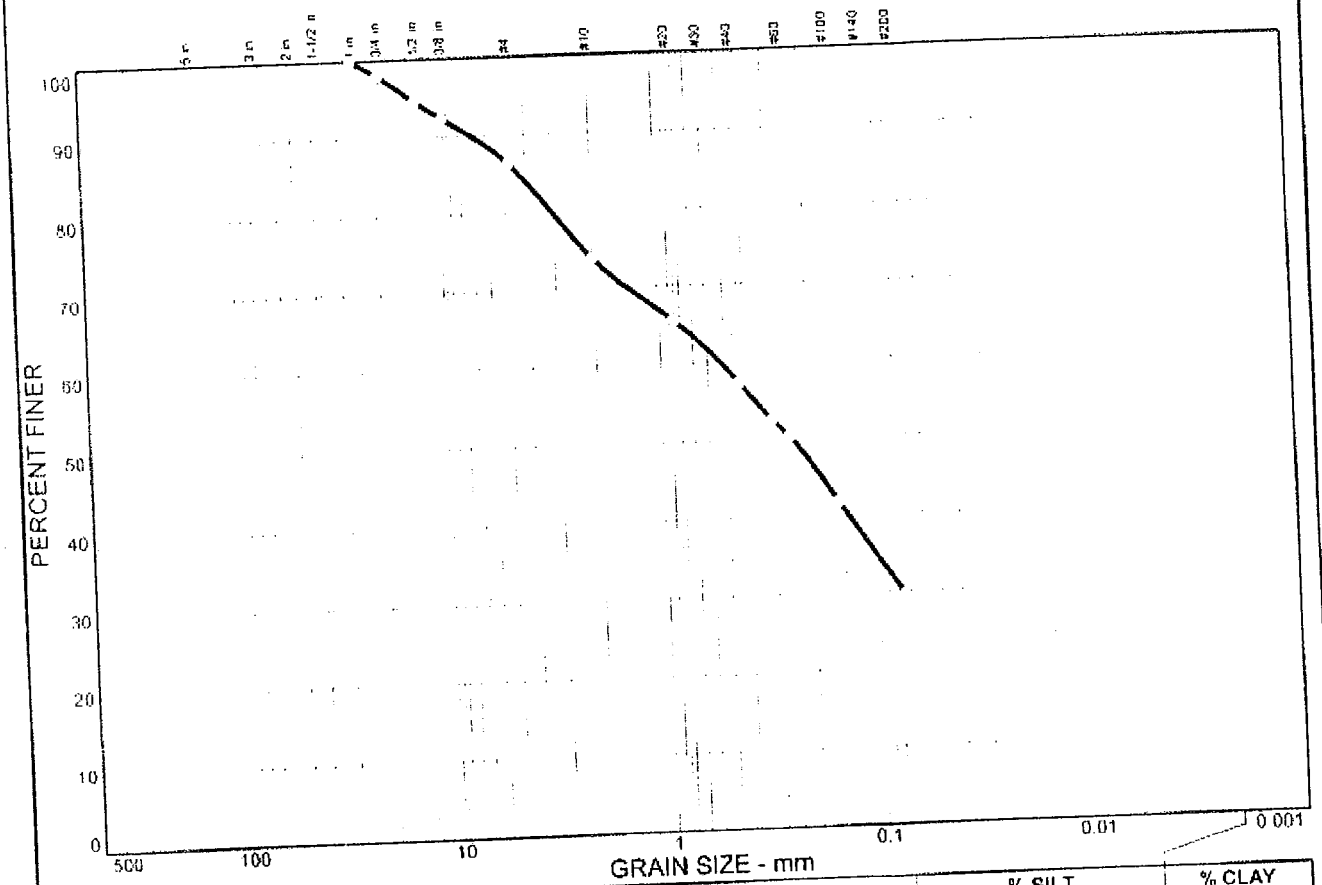
Very truly yours,

Whitney J Parker, P.E.
Director of Testing Services

enc.

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	13.7	56.6	29.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
3/4 in.	98.0		
1/2 in.	94.6		
3/8 in.	92.3		
#4	86.3		
#10	73.9		
#20	65.6		
#40	57.3		
#50	52.4		
#60	50.2		
#100	41.8		
#200	29.7		

* (no specification provided)

Soil Description

Brown fine topsoil/paper fiber blend
USDA Textural Classification = "Sandy Loam"

Atterberg Limits

PL= n/a LL= n/a PI= n/a

Coefficients

D_{85}= 4.28 D_{60}= 0.518 D_{50}= 0.246
D_{30}= 0.0763 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= topsoil/fiber AASHTO= topsoil/fiber

Remarks

Sample submitted by client on 6/15/11
see 6/16/11 letter for additional information

Sample No.: L-19191 **Source of Sample:** Charlton Landfill **Date:** 6/16/11
Location: 2000 c.y. **Elev./Depth:** 2000 c.y.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Projects
Project No: 26023

YANKEE ENGINEERING & TESTING, INC.

June 17, 2011

Mr. John Bates
J. Bates & Son, LLC
474 Main Street
Clinton, MA 01510

RE: Topsoil/Paperfiber 3000 c.y. Test Results
Charlton SLF Closure
Charlton, Massachusetts **Project # 26023**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro nutrient tests, and an aggregate gradation (ASTM D-422 to #200) analysis, completed on sample **L-19192,** submitted on June 16th 2011. Testing was in accordance with the LaMotte test methods and procedures, while the organic content was determined by weight loss on incineration. The laboratory test results and general conclusions are listed below:

pH – 7.8 Moderately basic, pH higher than State M1.05.0 "loam borrow" limits of 5.5 to 7.0
Organic Content – 9.2%, high, within M1.05.0 loam borrow limits of 4%-20%
Nitrogen, N (20 lb./acre) low, some additional nitrogen suggested
Phosphorus, P (200 lb./acre) good, minimal additional phosphorus suggested
Potash, K (160 lb./acre) fair, little additional potassium suggested

	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >.002)	Clay*(<.002 mm)
Total Gradation:	26	51	18	5
Sand Fraction:	0	69	24	7

* - due to the limited fines, the clay content was estimated to be about 20% of the weight passing #200 sieve.

USDA Textural (based on 100% < #10) Soil Classification = Sandy Loam
Observations: Sample was basically free of sticks, roots, and/or stones exceeding 2" and appeared suitable for typical grass growth.

Based on the high (7.8) pH, we suggest that about 1000 lb. per acre (25 lb./1000 s.f.) of "sulfur chips" be added to bring the pH "down about 1 point". Also, we believe that it would be beneficial to add 500+ lb./acre (12 lb./1000 s.f.) of a high nitrogen fertilizer (about 20-10-10) to achieve and maintain reasonable lawn grass growth.

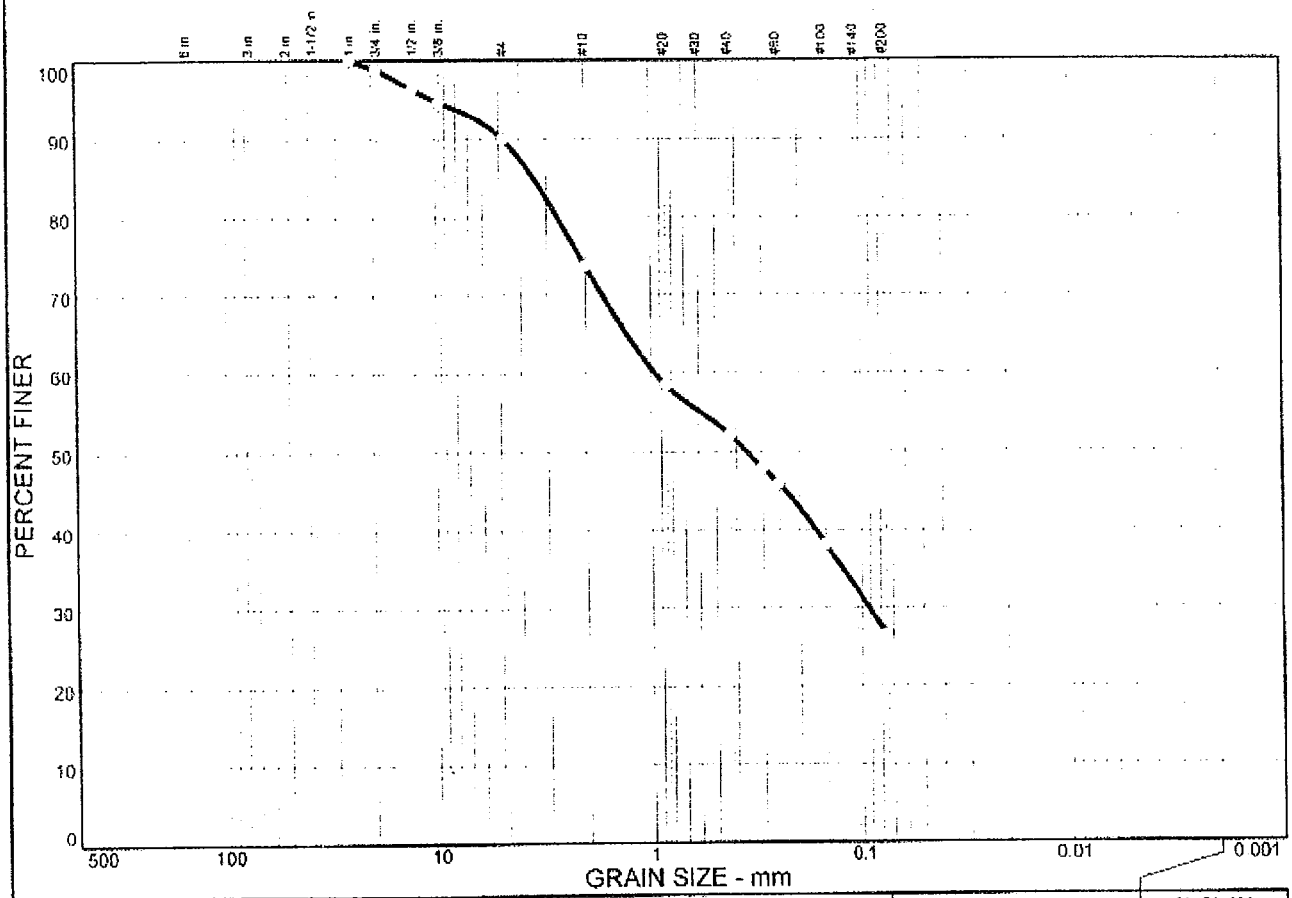
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J Parker, P.E.
Director of Testing Services
enc.

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	10.0	63.4	26.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
3/4 in.	98.8		
1/2 in.	96.4		
3/8 in.	94.7		
#4	90.0		
#10	73.8		
#20	58.5		
#40	52.1		
#50	47.9		
#60	45.9		
#100	38.2		
#200	26.6		

* (no specification provided)

Soil Description

Brown fine topsoil/paper fiber blend
USDA Textural Classification = Sandy Loam

Atterberg Limits

PL= n/a LL= n/a PI= n/a

Coefficients

D_{85}= 3.43 D_{60}= 0.955 D_{50}= 0.357
D_{30}= 0.0919 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= topsoil/fiber AASHTO= topsoil/fiber

Remarks

Sample submitted by client on 6/15/11
see 6/17/11 letter for additional information

Sample No.: L-19192 **Source of Sample:** Charlton Landfill **Date:** 6/17/11
Location: 3000 c.y. **Elev./Depth:** 3000 c.y.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Projects
Project No: 26023

YANKEE ENGINEERING & TESTING, INC.

June 18, 2011

Mr. John Bates
J. Bates & Son, LLC
474 Main Street
Clinton, MA 01510

RE: Topsoil/Paperfiber 4000 c.y. Test Results
Charlton SLF Closure
Charlton, Massachusetts **Project # 26023**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro nutrient tests, and an aggregate gradation (ASTM D-422 to #200) analysis, completed on sample **L-19193,** submitted on June 16th 2011. Testing was in accordance with the LaMotte test methods and procedures, while the organic content was determined by weight loss on incineration. The laboratory test results and general conclusions are listed below:

pH – 8.0 Moderately basic, pH higher than State M1.05.0 "loam borrow" limits of 5.5 to 7.0
Organic Content - 9.6%, high, within M1.05.0 loam borrow limits of 4%-20%
Nitrogen, N (10 lb./acre) low, some additional nitrogen suggested
Phosphorus, P (200 lb./acre) good, minimal additional phosphorus suggested
Potash, K (200 lb./acre) fair, little additional potassium suggested

	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >.002)	Clay*(<.002 mm)
Total Gradation:	26	52	17	5
Sand Fraction:	0	70	23	7

* - due to the limited fines, the clay content was estimated to be about 20% of the weight passing #200 sieve.

USDA Textural (based on 100% < #10) Soil Classification = Sandy Loam
Observations: Sample was basically free of sticks, roots, and/or stones exceeding 2" and appeared suitable for typical grass growth.

Based on the high (8.0) pH, we suggest that about 1000 lb. per acre (25 lb./1000 s.f.) of "sulfur chips" be added to bring the pH "down about 1 point". Also, we believe that it would be beneficial to add 500" lb./acre (12 lb./1000 s.f.) of a high nitrogen fertilizer (about 20-10-10) to achieve and maintain reasonable lawn grass growth.

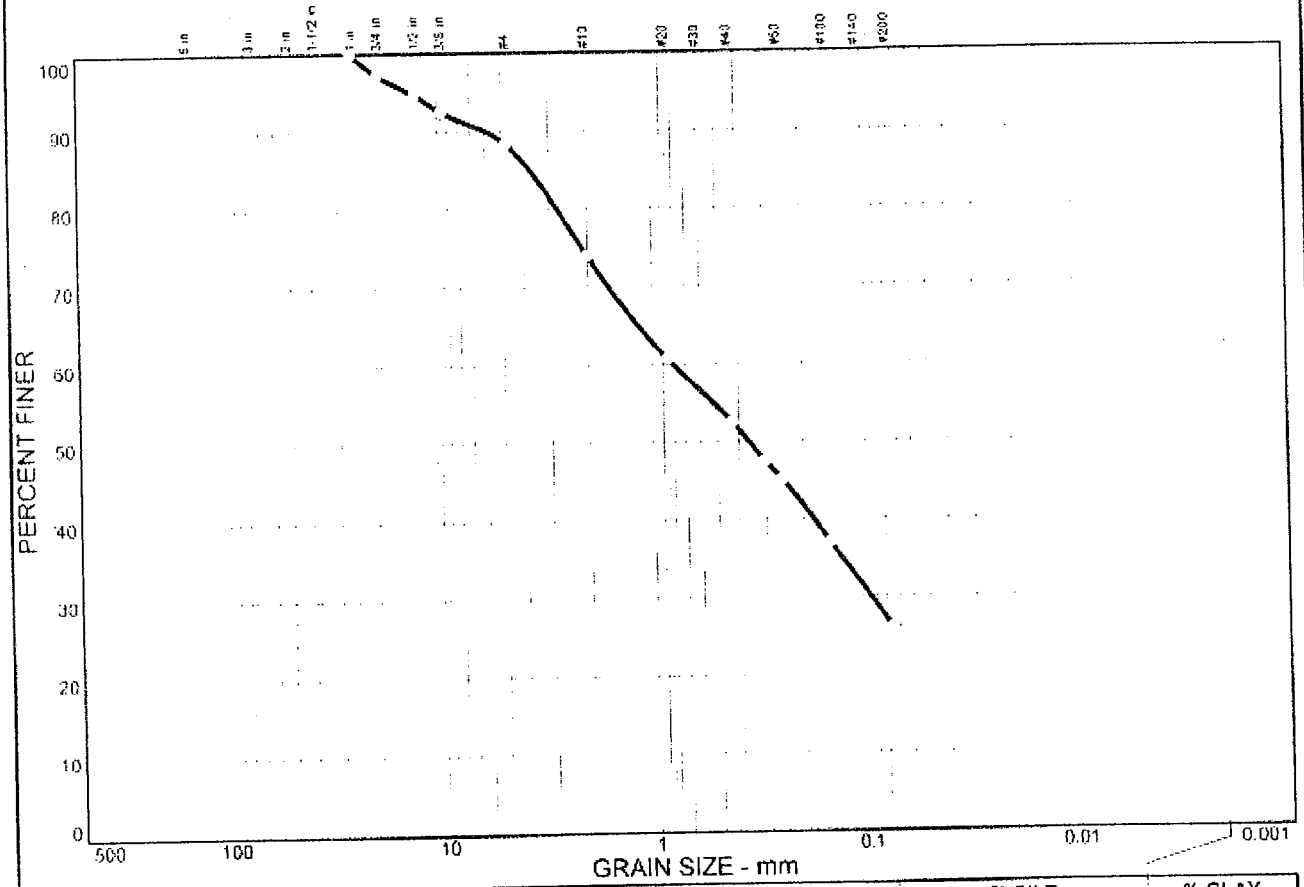
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J Parker, P.E.
Director of Testing Services
enc.

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	11.6	62.3	26.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
3/4 in.	97.3		
1/2 in.	94.8		
3/8 in.	92.6		
#4	88.4		
#10	74.0		
#20	60.7		
#40	52.5		
#50	47.5		
#60	45.1		
#100	37.1		
#200	26.1		

* (no specification provided)

Soil Description

Brown fine topsoil/paper fiber blend
USDA Textural Classification

Atterberg Limits

PL= n/a LL= n/a PI= n/a

Coefficients

D_{85}= 3.66 D_{60}= 0.802 D_{50}= 0.357
D_{30}= 0.0962 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= topsoil/fiber AASHTO= topsoil/fiber

Remarks

Sample submitted by client on 6/15/11
see 6/18/11 letter for additional information

Sample No.: L-19193 **Source of Sample:** Charlton Landfill **Date:** 6/17/11
Location: 4000 c.y. **Elev./Depth:** 4000 c.y.

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Projects
Project No: 26023

YANKEE ENGINEERING & TESTING, INC.

June 30, 2011

Mr. John Bates
J. Bates & Son, LLC
474 Main Street
Clinton, MA 01510

RE: **Topsoil/Paperfiber 5000 c.y. Test Results**
Charlton SLF Closure
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro nutrient tests, and an aggregate gradation (ASTM D-422 to #200) analysis, completed on sample **L-19249,** submitted on June 29th 2011. Testing was in accordance with the LaMotte test methods and procedures, while the organic content was determined by weight loss on incineration. The laboratory test results and general conclusions are listed below:

pH – 7.6 Moderately basic, outside State M1.05.0 "loam borrow" limits of 5.5 to 7.0
Organic Content – 9.9%, high, within M1.05.0 loam borrow limits of 4%-20%
Nitrogen, N (10 lb./acre) low, some additional nitrogen suggested
Phosphorus, P (100 lb./acre) good, minimal additional phosphorus suggested
Potash, K (100 lb./acre) low, some additional potassium suggested

	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >.002)	Clay*(<.002 mm)
Total Gradation:	34	45	16	5
Sand Fraction:	0	68	24	8

* - due to the limited fines, the clay content was estimated to be about 20% of the weight passing #200 sieve.

USDA Textural (based on 100% < #10) Soil Classification = Sandy Loam
Observations: Sample was basically free of sticks, roots, and/or stones exceeding 2" and appeared suitable for typical grass growth.

Based on the high (7.6) pH, we suggest that about 500 lb. per acre (25 lb./1000 s.f.) of "sulfur chips" be added to bring the pH "down about 1/2 point". Also, we believe that it would be beneficial to add 500± lb./acre (12 lb./1000 s.f.) of a high nitrogen fertilizer (about 20-10-10) to achieve and maintain reasonable lawn grass growth.

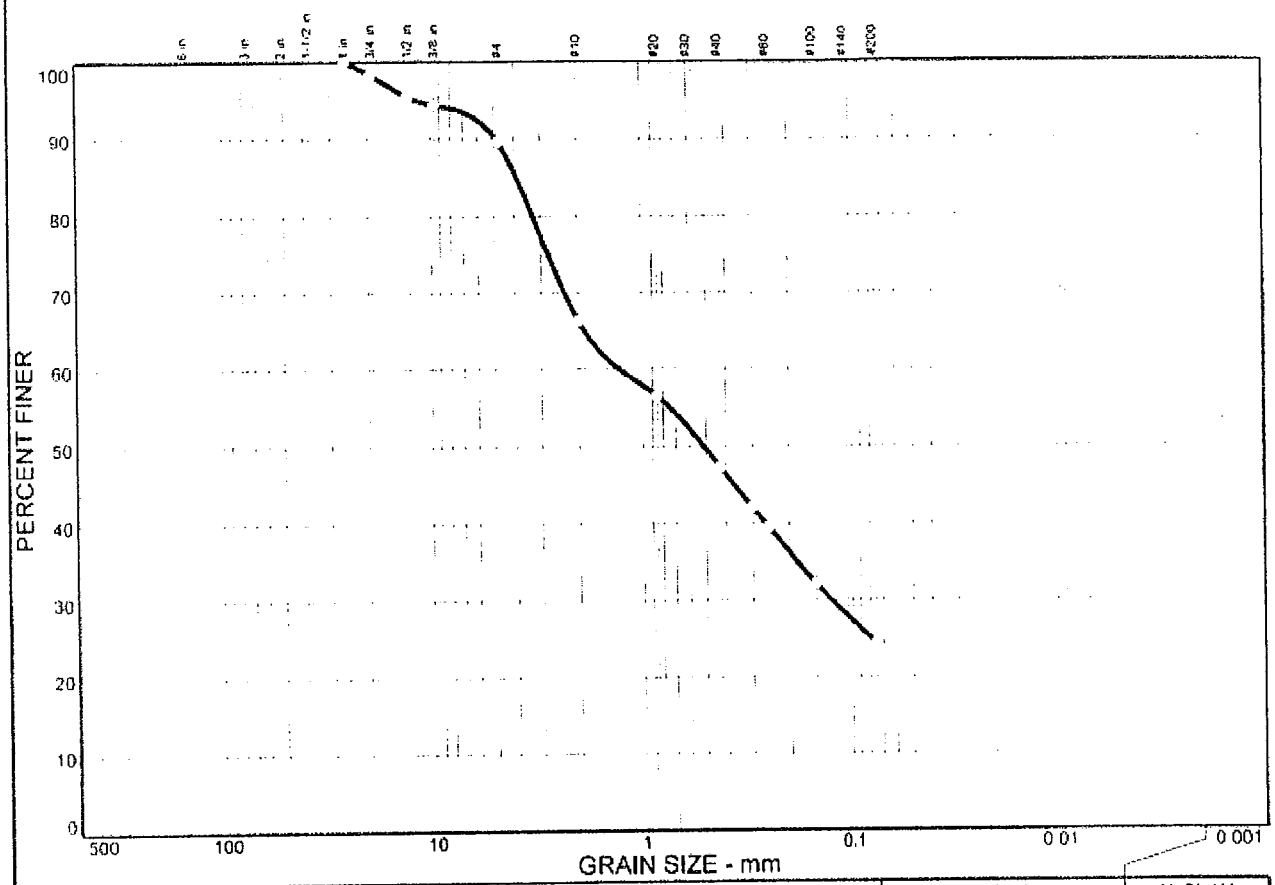
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J Parker, P.E.
Director of Testing Services
enc.
[illegible]

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	10.5	65.2	24.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
3/4 in.	98.4		
1/2 in.	95.5		
3/8 in.	94.4		
#4	89.5		
#10	66.3		
#20	56.5		
#40	47.2		
#50	42.1		
#60	39.5		
#100	32.1		
#200	24.3		

* (no specification provided)

Soil Description

Light brown silty topsoil/paperfiber blend trace gravel
USDA Textural Classification = Sandy Loam

Atterberg Limits

PL= untested LL= untested PI= untested

Coefficients

D_{85}= 3.89 D_{60}= 1.28 D_{50}= 0.513
D_{30}= 0.127 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= topsoil/fiber AASHTO= topsoil/fiber

Remarks

Sample submitted by client on 6/29/11
See letter dated 6/30/11 for additional information

Sample No.: L-19249 **Source of Sample:** Nichols Enterprises **Date:** 6/30/11
Location: Topsoil Bulk Sample (5000 c.y.) **Elev./Depth:** submitted

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

YANKEE ENGINEERING & TESTING, INC.

July 1, 2011

Mr. John Bates
J. Bates & Son, LLC
474 Main Street
Clinton, MA 01510

RE: Topsoil/Paperfiber 6000 c.y. Test Results
Charlton SLF Closure
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro nutrient tests, and an aggregate gradation (ASTM D-422 to #200) analysis, completed on sample **#L-19250,** submitted on June 29th 2011. Testing was in accordance with the LaMotte test methods and procedures, while the organic content was determined by weight loss on incineration. The laboratory test results and general conclusions are listed below:

pH – 7.4 Slightly basic, outside State M1.05.0 "loam borrow" limits of 5.5 to 7.0
Organic Content – 8.7%, high, within M1.05.0 loam borrow limits of 4%-20%
Nitrogen, N (10 lb./acre) low, some additional nitrogen suggested
Phosphorus, P (100 lb./acre) good, minimal additional phosphorus suggested
Potash, K (100 lb./acre) low, some additional potassium suggested

	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >.002)	Clay*(<.002 mm)
Total Gradation:	38	43	15	4
Sand Fraction:	0	69	24	7

* - due to the limited fines, the clay content was estimated to be about 20% of the weight passing #200 sieve.

USDA Textural (based on 100% < #10) Soil Classification = Sandy Loam
Observations: Sample was basically free of sticks, roots, and/or stones exceeding 2" and appeared suitable for typical grass growth.

Based on the high (7.4) pH, we suggest that about 500 lb. per acre (25 lb./1000 s.f.) of "sulfur chips" be added to bring the pH "down about 1/2 point". Also, we believe that it would be beneficial to add 500+ lb./acre (12 lb./1000 s.f.) of a high nitrogen fertilizer (about 20-10-10) to achieve and maintain reasonable lawn grass growth.

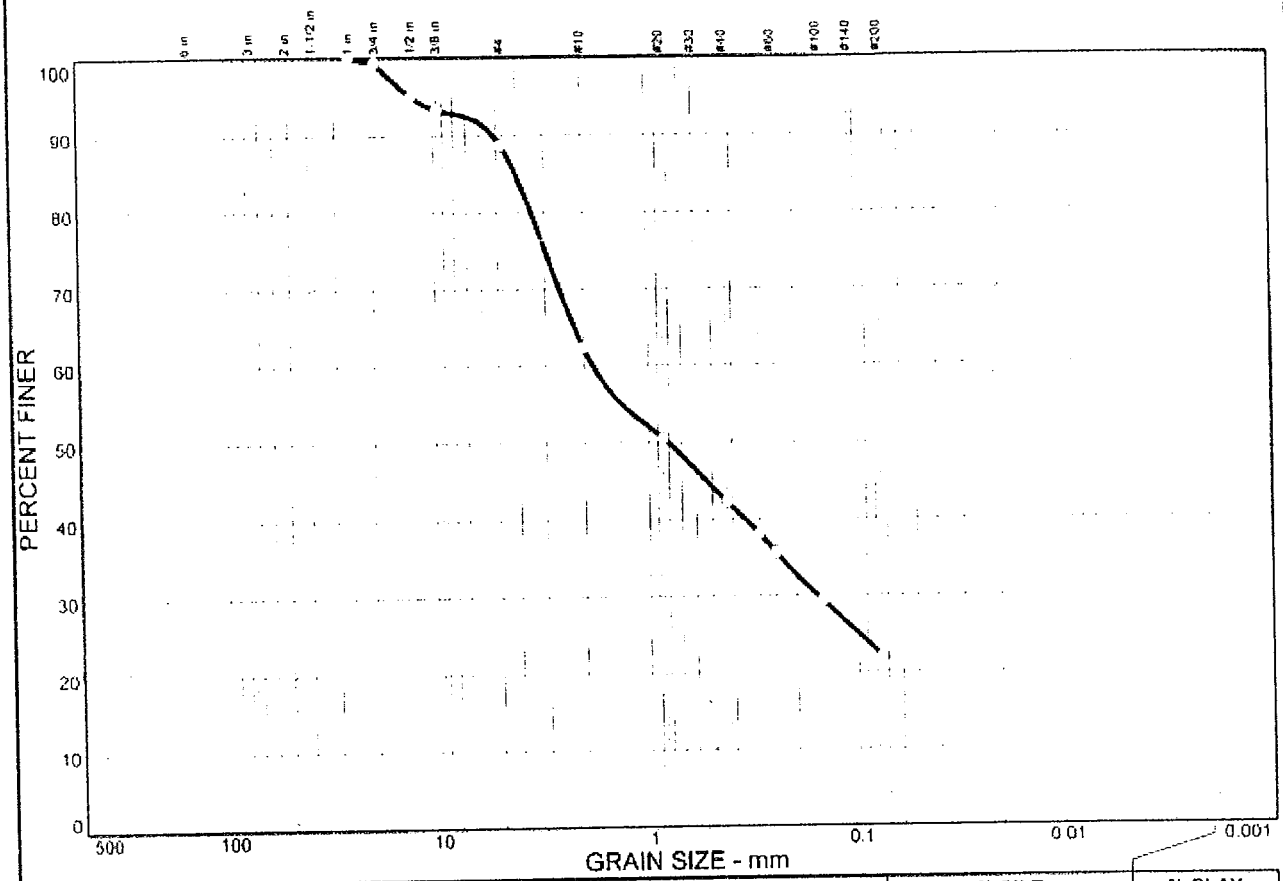
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J Parker, P.E.
Director of Testing Services
enc.
[illegible]

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	11.3	66.7	22.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
3/4 in.	99.4		
1/2 in.	95.1		
3/8 in.	93.3		
#4	88.7		
#10	62.3		
#20	50.5		
#40	42.2		
#50	38.1		
#60	35.6		
#100	29.4		
#200	22.0		

* (no specification provided)

Soil Description

Light brown silty topsoil/paperfiber blend trace gravel
USDA Textural Classification = Sandy Loam

Atterberg Limits

PL= untested LL= untested PI= untested

Coefficients

D_{85}= 4.06 D_{60}= 1.81 D_{50}= 0.810
D_{30}= 0.158 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= topsoil/fiber AASHTO= topsoil/fiber

Remarks

Sample submitted by client on 6/29/11
See letter dated 7/1/11 for additional information

Sample No.: L-19250 **Source of Sample:** Nichols Enterprises **Date:** 6/30/11
Location: Topsoil Bulk Sample (6000 c.y.) **Elev./Depth:** submitted

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

YANKEE ENGINEERING & TESTING, INC.

July 18, 2011

Mr. John Bates
J. Bates & Son, LLC
474 Main Street
Clinton, MA 01510

RE: Topsoil/Paperfiber 7000 c.y. Test Results
Charlton SLF Closure
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro nutrient tests, and an aggregate gradation (ASTM D-422 to #200) analysis, completed on sample **#L-19284,** submitted on July 11th 2011. Testing was in accordance with the LaMotte test methods and procedures, while the organic content was determined by weight loss on incineration. The laboratory test results and general conclusions are listed below:

pH – 7.6 Slightly basic, outside State M1.05.0 "loam borrow" limits of 5.5 to 7.0
Organic Content – 9.7%, high, within M1.05.0 loam borrow limits of 4%-20%
Nitrogen, N (10 lb./acre) low, some additional nitrogen suggested
Phosphorus, P (50 lb./acre) fail, little additional phosphorus suggested
Potash, K (100 lb./acre) low, some additional potassium suggested

	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >.002)	Clay*(<.002 mm)
Total Gradation:	37	44	14	5
Sand Fraction:	0	70	22	8

* - due to the limited fines, the clay content was estimated to be about 20% of the weight passing #200 sieve.

USDA Textural (based on 100% < #10) Soil Classification = Sandy Loam
Observations: Sample was basically free of sticks, roots, and/or stones exceeding 2" and appeared suitable for typical grass growth.

Based on the high (7.6) pH, we suggest that about 500 lb. per acre (25 lb./1000 s.f.) of "sulfur chips" be added to bring the pH "down about 1/2 point". Also, we believe that it would be beneficial to add 500+ lb./acre (12 lb./1000 s.f.) of a high nitrogen fertilizer (about 20-10-10) to achieve and maintain reasonable lawn grass growth.

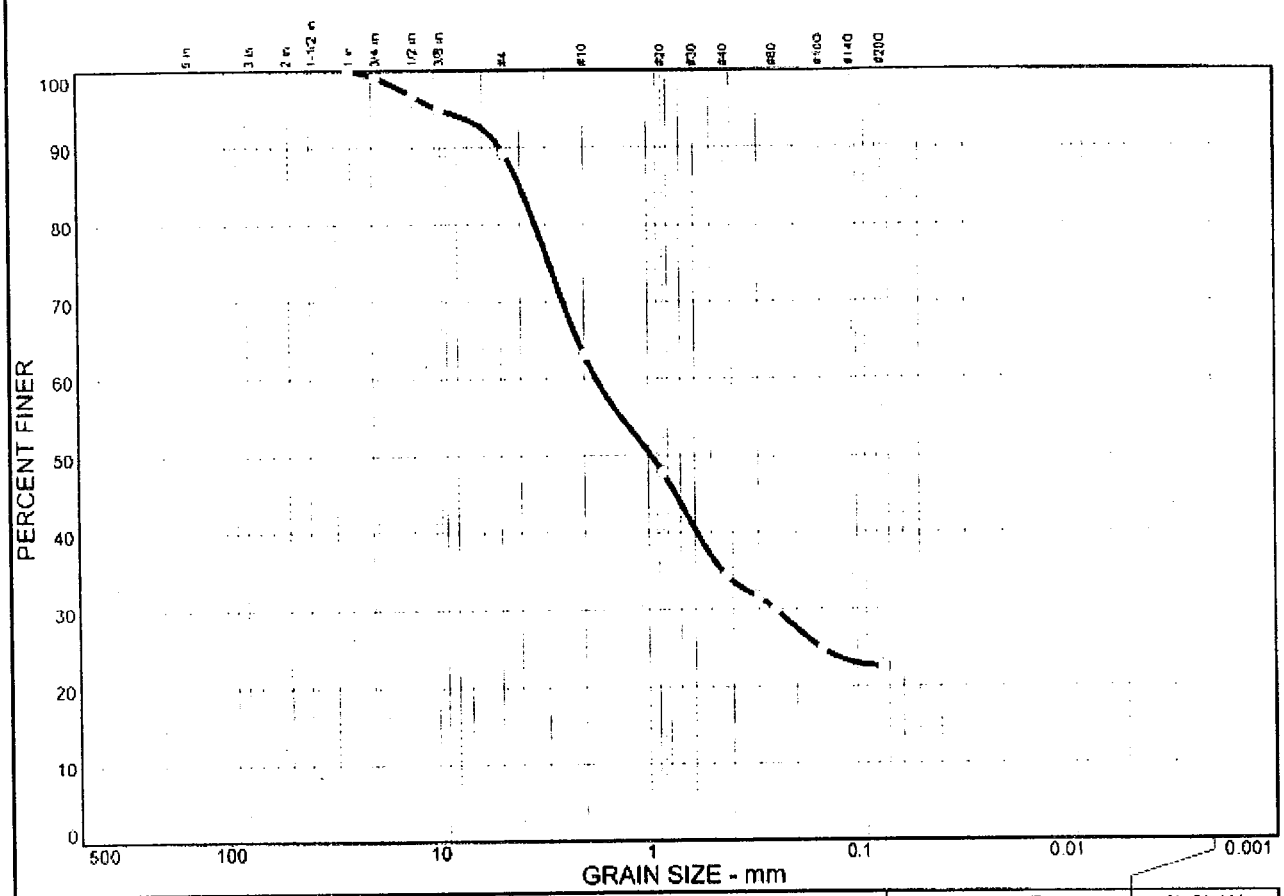
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J Parker, P.E.
Director of Testing Services
enc.
c:\work\projects\11015\Charlton SLF\19284 Topsoil 7000 c.y.lbl

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	10.8	66.7	22.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
3/4 in.	99.1		
1/2 in.	96.7		
3/8 in.	94.9		
#4	89.2		
#10	63.1		
#20	47.8		
#40	34.4		
#50	31.6		
#60	30.0		
#100	24.9		
#200	22.5		

* (no specification provided)

Soil Description

Light brown silty topsoil/paperfiber blend little gravel
USDA Textural Classification = Sandy Loam

Atterberg Limits

PL= n/a LL= n/a PI= n/a

Coefficients

D_{85}= 3.99 D_{60}= 1.76 D_{50}= 0.964
D_{30}= 0.250 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= topsoil/fiber AASHTO= topsoil/fiber

Remarks

Sample submitted by client (Pete) on 7/11/11
See letter dated 7/18/11 for additional information

Sample No.: L-19284 **Source of Sample:** Nichols Enterprises **Date:** 7/15/11
Location: Topsoil Bulk Sample (7000 c.y.) **Elev./Depth:** submitted

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

YANKEE ENGINEERING & TESTING, INC.

August 1, 2011

Mr. John Bates
J. Bates & Son, LLC
474 Main Street
Clinton, MA 01510

RE: Topsoil/Paperfiber 8000 c.y. Test Results
Charlton SLF Closure
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro nutrient tests, and an aggregate gradation (ASTM D-422 to #200) analysis, completed on sample **#L-19359,** submitted on July 27th 2011. Testing was in accordance with the LaMotte test methods and procedures, while the organic content was determined by weight loss on incineration. The laboratory test results and general conclusions are listed below:

pH – 7.2 slightly basic, close to State M1.05.0 "loam borrow" limits of 5.5 to 7.0
Organic Content – 10.0%, high, within M1.05.0 loam borrow limits of 4%-20%
Nitrogen, N (10 lb./acre) low, some additional nitrogen suggested
Phosphorus, P (200 lb./acre) good, minimal additional phosphorus suggested
Potash, K (100 lb./acre) low, some additional potassium suggested

	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >.002)	Clay*(<.002 mm)
Total Gradation:	32	46	17	5
Sand Fraction:	0	68	25	7

* - due to the limited fines, the clay content was estimated to be about 20% of the weight passing #200 sieve.

USDA Textural (based on 100% < #10) Soil Classification = Sandy Loam
Observations: Sample was basically free of sticks, roots, and/or stones exceeding 2" and appeared suitable for typical grass growth.

Based on the neutral (7.2) pH, no lime is required. Also, we believe that it would be beneficial to add 500+ lb./acre (12 lb./1000 s.f.) of a high nitrogen fertilizer (about 20-10-10) to achieve and maintain reasonable lawn grass growth.

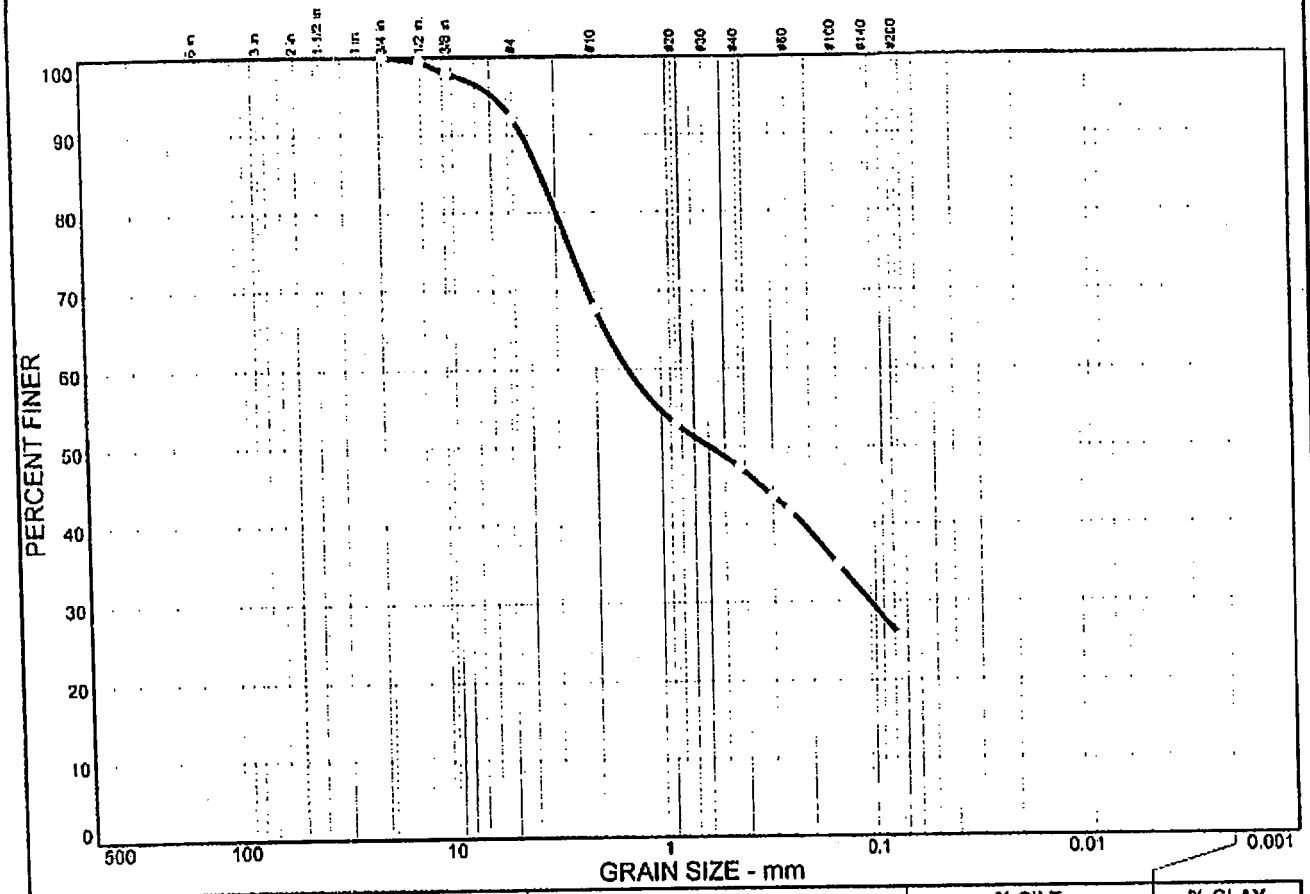
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Very truly yours,

Whitney J Parker, P.E.
Director of Testing Services
cnc.
[illegible]

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	7.9	66.5	25.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4 in.	100.0		
1/2 in.	99.5		
3/8 in.	98.0		
#4	92.1		
#10	67.8		
#20	53.0		
#40	47.3		
#50	43.6		
#60	41.7		
#100	34.8		
#200	25.6		

* (no specification provided)

Soil Description

Light brown silty topsoil/paperfiber blend trace gravel
USDA Textural Classification = Sandy Loam

Atterberg Limits

PL= n/a LL= n/a PI= n/a

Coefficients

D_{85}= 3.54 D_{60}= 1.41 D_{50}= 0.590
D_{30}= 0.105 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= topsoil/fiber AASHTO= topsoil/fiber

Remarks

Sample submitted by client on 7/27/11
See letter dated 8/1/11 for additional information

Sample No.: L-19359 **Source of Sample:** Nichols Enterprises **Date:** 8/1/11
Location: Topsoil Bulk Sample (8000 c.y.) **Elev./Depth:** submitted

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

YANKEE ENGINEERING & TESTING, INC.

August 2, 2011

Mr. John Bates
J. Bates & Son, LLC
474 Main Street
Clinton, MA 01510

RE: Topsoil/Paperfiber 9000 c.y. Test Results
Charlton SLF Closure
Charlton, Massachusetts **Project # 11015**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro nutrient tests, and an aggregate gradation (ASTM D-422 to #200) analysis, completed on sample **#L-19360,** submitted on July 27th 2011. Testing was in accordance with the LaMotte test methods and procedures, while the organic content was determined by weight loss on incineration. The laboratory test results and general conclusions are listed below:

pH – 7.4 Slightly basic, outside State M1.05.0 "loam borrow" limits of 5.5 to 7.0
Organic Content – 9.5%, high, within M1.05.0 loam borrow limits of 4%-20%
Nitrogen, N (10 lb./acre) low, some additional nitrogen suggested
Phosphorus, P (200 lb./acre) good, minimal additional phosphorus suggested
Potash, K (100 lb./acre) low, some additional potassium suggested

	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >.002)	Clay*(<.002 mm)
Total Gradation:	32	51	13	4
Sand Fraction:	0	75	19	6

* - due to the limited fines, the clay content was estimated to be about 20% of the weight passing #200 sieve.

USDA Textural (based on 100% < #10) Soil Classification = Sandy Loam
Observations: Sample was basically free of sticks, roots, and/or stones exceeding 2" and appeared suitable for typical grass growth.

Based on the high (7.4) pH, we suggest that about 500± lb. per acre (25 lb./1000 s.f.) of "sulfur chips" be added to bring the pH "down about 1/2 point". Also, we believe that it would be beneficial to add 500± lb./acre (12 lb./1000 s.f.) of a high nitrogen fertilizer (about 20-10-10) to achieve and maintain reasonable lawn grass growth.

We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

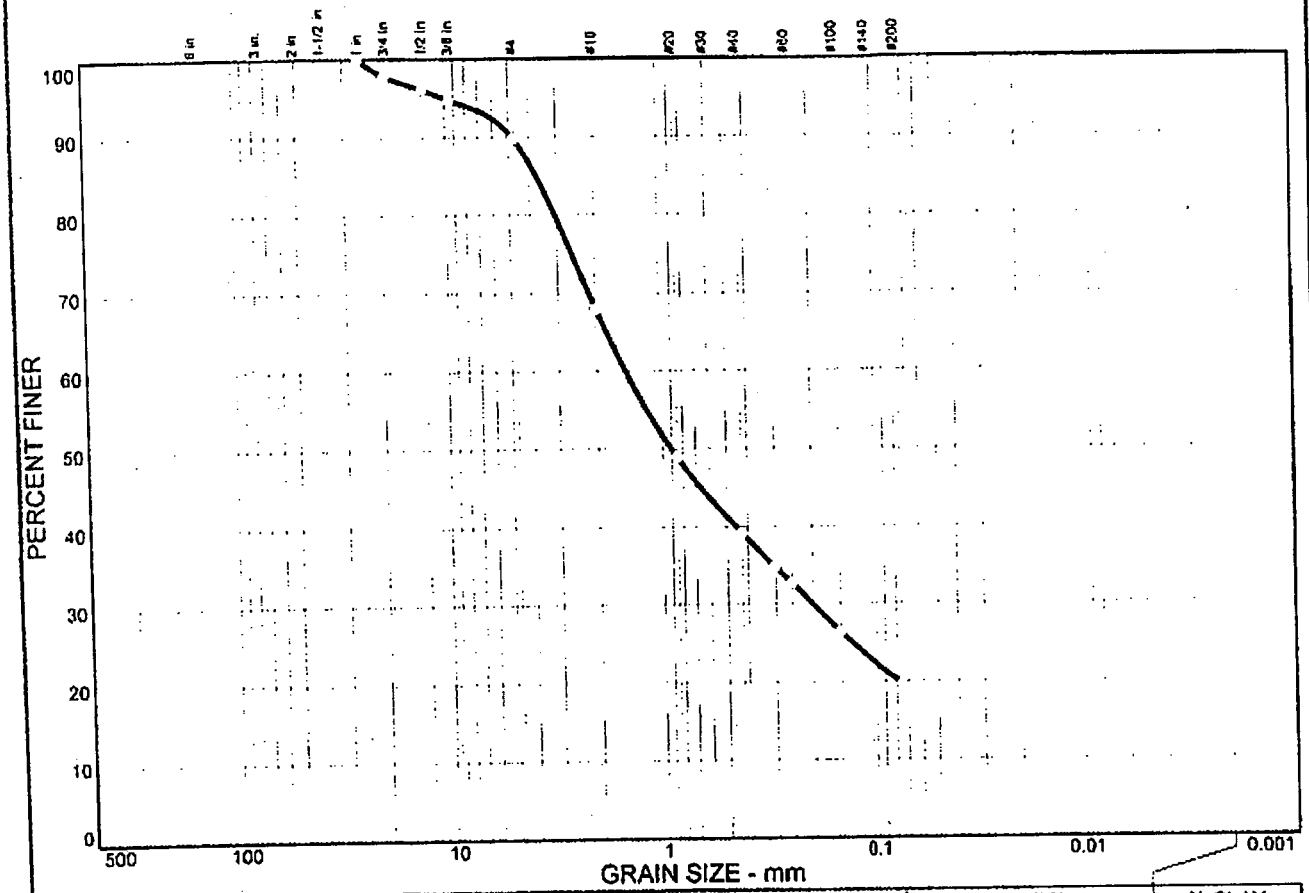
Very truly yours,

Whitney J Parker, P.E.
Director of Testing Services

enc.
(work\projects\11015\Charlton SLF\L19360 Topsoil 9000 c.y.doc)

10 Mason Street, Worcester, Massachusetts 01609
TEL (508) 831-7404 FAX (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	10.3	70.1	19.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
3/4 in.	97.8		
1/2 in.	96.1		
3/8 in.	94.7		
#4	89.7		
#10	68.0		
#20	48.9		
#40	39.2		
#50	34.8		
#60	32.7		
#100	26.4		
#200	19.6		

* (no specification provided)

Soil Description

Light brown silty topsoil/paperfiber blend little gravel
USDA Textural Classification = Sandy Loam

Atterberg Limits

PL= n/a LL= n/a PI= n/a

Coefficients

D_{85}= 3.73 D_{60}= 1.46 D_{50}= 0.906
D_{30}= 0.201 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= topsoil/fiber AASHTO= topsoil/fiber

Remarks

Sample submitted by client on 7/27/11
See letter dated 8/2/11 for additional information

Sample No.: L-19360 **Source of Sample:** Nichols Enterprises **Date:** 8/1/11
Location: Topsoil Bulk Sample (9000 c.y.) **Elev./Depth:** submitted

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son, LLC
Project: Charlton SLF
Charlton, Massachusetts
Project No: 11015

Appendix I

Construction Photos

Construction Photos Included on CD

Appendix J
Daily Field Reports

2009 Emergency Site Stabilization
Weekly Field Reports

CDM Smith

PROJECT:	Flint Road Landfill Closure
OWNER:	Town of Charlton, Massachusetts
CONTRACTOR:	T. Ford Company Inc.
LOCATION:	Flint Road, Charlton, Massachusetts
WEATHER:	Cloudy TEMP: 32-65 F Work hours 0700-1500

NO. OF CONTRACT DAYS COMPLETED: (90 total)	5

T. FORD MANPOWER-
1-Superintendent
1-Operator

T. FORD EQUIPMENT-
1-Komatsu PC300 Excavator
1-CAT D6M Bulldozer
1-CAT 966G Loader
1-Volvo A25C End Dump Truck
2-Pickup Trucks
1-IR 100 Vibratory Roller
1-GPS System

T. FORD ACTIVITIES-

Contractor began to shape and regrade the north and south access roadways using existing on site soils.

Contractor began to consolidate (combine) the soil stockpiles adjacent to the field office trailer.

Contractor also began to shape and regrade the stormwater detention basin located on the west side of the landfill. The removed soils and sediments were transported to and stockpiled on the northeast side of the site.

Charles Sells Survey Company on site to establish survey control along the south side access roadway.

The previous contractor – BATG Environmental to date has not removed any of their on site equipment and materials previously left at the site upon their departure.

PROJECT:	Flint Road Landfill Closure
OWNER:	Town of Charlton, Massachusetts
CONTRACTOR:	T. Ford Company Inc.
LOCATION:	Flint Road, Charlton, Massachusetts
WEATHER:	Cloudy TEMP: 32-65 F Work hours 0700-1500

NO. OF CONTRACT DAYS COMPLETED: (90 total)	10

T. FORD MANPOWER-
1-Superintendent
1-Operator

T. FORD EQUIPMENT-
1-Komatsu PC300 Excavator
1-CAT D6M Bulldozer
1-CAT 966G Loader
1-Volvo A25C End Dump Truck
2-Pickup Trucks
1-IR 100 Vibratory Roller
1-GPS System
1-Soil Screening Plant

T. FORD ACTIVITIES-

Contractor continued to shape and regrade the north and south access roadways using existing on site soils.

Contractor continued to consolidate (combine) the soil stockpiles adjacent to the field office trailer.

Contractor continued to shape and regrade the stormwater detention basin located on the west side of the landfill. The removed soils and sediments were transported to and stockpiled on the northeast side of the site.

Began to screen the on site soil stockpiles to 4" minus. This material will be used in the anchor trench construction areas. The screening process was slow due to the amount of debris and moisture content in the stockpiled soils.

PROJECT:	Flint Road Landfill Closure
OWNER:	Town of Charlton, Massachusetts
CONTRACTOR:	T. Ford Company Inc.
LOCATION:	Flint Road, Charlton, Massachusetts
WEATHER:	Cloudy TEMP: 36-55 F Work hours 0700-1500

NO. OF CONTRACT DAYS COMPLETED: (90 total)	15

T. FORD MANPOWER-
1-Superintendent
1-Operator

T. FORD EQUIPMENT-
1-Komatsu PC300 Excavator
1-Komatsu PC150LC Excavator
1-Kubota Mini Excavator
1-CAT D6M Bulldozer
1-CAT 966G Loader
1-Volvo A25C End Dump Truck
2-Pickup Trucks
1-IR 100 Vibratory Roller
1-GPS System

CHENANGO CONTRACTING MANPOWER-
1-Superintendent
1-Laborer

CHENANGO CONTRACTING EQUIPMENT-
1-Pickup Truck
1-Trailer
2-Generators
Liner Seaming Equipment

T. FORD ACTIVITIES-

Contractor continued to shape and regrade the stormwater detention basin located on the west side of the site. The removed soils were transported and stockpiled on the northeast side of the site.

Continued to place geotextile fabric, screened gravel and rip rap in the west side detention basin and north side stormwater rip rap swale.

Began to place and compact 6" of loam on the west detention basin slopes.

Placed erosion control blankets along the slopes.

Subcontractor – S&M Farms on site to install **286 LF** of hay bales and silt fence in the two washout areas located along the wetlands border.

CHENANGO ACTIVITIES-

Began to install and weld the 40 mil smooth FML LDPE linear flaps to cover the anchor trench along the north access roadway. Performed the required QA/QC testing on the installed flaps. The flaps were installed at a minimum width of 11.5' to allow for the installation of screened gravel and riprap in the anchor trench at a later date.

PROJECT:	Flint Road Landfill Closure
OWNER:	Town of Charlton, Massachusetts
CONTRACTOR:	T. Ford Company Inc.
LOCATION:	Flint Road, Charlton, Massachusetts
WEATHER:	Cloudy TEMP: 40-52 F Work hours 0700-1500

NO. OF CONTRACT DAYS COMPLETED: (90 total)	20

T. FORD MANPOWER-
1-Superintendent
2-Operators
1-Laborer

T. FORD EQUIPMENT-
1-Komatsu PC300 Excavator
1-Komatsu PC150LC Excavator
1-Kubota Mini Excavator
1-CAT D6M Bulldozer
1-CAT 966G Loader
1-Volvo A25C End Dump Truck
2-Pickup Trucks
1-IR 100 Vibratory Roller
1-GPS System

CHENANGO CONTRACTING MANPOWER-
1-Superintendent
1-Laborer

CHENANGO CONTRACTING EQUIPMENT-
1-Pickup Truck
1-6 Wheel ATV
1-Trailer
2-Generators
Liner Seaming Equipment

T. FORD ACTIVITIES-

Contractor continued to shape and regrade the stormwater rip rap down chute located on the south side of the site. The removed soils were transported and stockpiled on the northeast side of the site.

Continued to remove excess soil from the southwest side of the site. The removed soils were transported to and stockpiled on the northeast side of the site.

Continued to place geotextile fabric, screened gravel and rip rap in the north side rip rap stormwater swale.

Continued to place and compact 6″ of loam on the west detention basin slopes.

Attended weekly progress meeting to discuss issues.

CHENANGO ACTIVITIES-

Continued to install and weld the 40 mil smooth FML LDPE linear flaps to cover the anchor trench around the landfill perimeter base. Performed the required QA/QC testing on the installed flaps. The flaps were installed at a minimum width of 11.5′ to allow for the installation of screened gravel and riprap in the anchor trench at a later date.

PROJECT:	Flint Road Landfill Closure
OWNER:	Town of Charlton, Massachusetts
CONTRACTOR:	T. Ford Company Inc.
LOCATION:	Flint Road, Charlton, Massachusetts
WEATHER:	Cloudy TEMP: 30-56 F Work hours 0700-1500

NO. OF CONTRACT DAYS COMPLETED: (90 total)	25

T. FORD MANPOWER-
1-Superintendent
2-Operators
1-Laborer

T. FORD EQUIPMENT-
1-Komatsu PC300 Excavator
1-Komatsu PC150LC Excavator
1-Kubota Mini Excavator
1-CAT D6M Bulldozer
1-CAT 966G Loader
1-Volvo A25C End Dump Truck
2-Pickup Trucks
1-IR 100 Vibratory Roller
1-GPS System

CHENANGO CONTRACTING MANPOWER-
1-Superintendent
1-Laborer (2-Additional Laborers on 11/19/09)

CHENANGO CONTRACTING EQUIPMENT-
1-Pickup Truck
1-6 Wheel ATV
1-Trailer
2-Generators
Liner Seaming Equipment

T. FORD ACTIVITIES-

Contractor continued to shape and regrade the stormwater swale located on the south side of the site. The removed soils were transported to and stockpiled on the northeast side of the site.

Continued to place and compact 6″ of loam on the west detention basin slopes.

Attended weekly progress meeting to discuss issues.

CHENANGO ACTIVITIES-

Continued to install of the 40 mil smooth FML LDPE linear flaps to cover the anchor trench around the landfill perimeter base. Liner welding work is not completed. Performed the required QA/QC testing on the installed flaps. The flaps were installed at various widths to allow for the installation of screened gravel and riprap in the anchor trench at a later date.

Began to repair the landfill gas vent boots using on site textured liner material. Performed the required QA/QC testing on the repairs.

PROJECT:	Flint Road Landfill Closure
OWNER:	Town of Charlton, Massachusetts
CONTRACTOR:	T. Ford Company Inc.
LOCATION:	Flint Road, Charlton, Massachusetts
WEATHER:	Rain TEMP: 30-56 F Work hours 0700-1500

NO. OF CONTRACT DAYS COMPLETED: (90 total)	30

T. FORD MANPOWER-
1-Superintendent
2-Operators
1-Laborer

T. FORD EQUIPMENT-
1-Komatsu PC300 Excavator
1-Komatsu PC150LC Excavator
1-Kubota Mini Excavator
1-CAT D6M Bulldozer
1-CAT 966G Loader
1-Volvo A25C End Dump Truck
2-Pickup Trucks
1-IR 100 Vibratory Roller
1-GPS System

CHENANGO CONTRACTING MANPOWER-
None-not on site this week

CHENANGO CONTRACTING EQUIPMENT-
1-6 Wheel ATV
1-Trailer
2-Generators
Liner Seaming Equipment

T. FORD ACTIVITIES-

Contractor continued to shape and regrade the stormwater rip rap swale located on the south side of the site. The removed soils were transported to and stockpiled on the northeast side of the site. Began to install geotextile fabric, 6″ of screened gravel and 1′ of rip rap as required to construct the stormwater rip rap swale.

Continued to shape and grade the anchor trench on the east side of the site.

Continued to place and compact 6″ of loam on the west detention basin slopes.

Attended weekly progress meeting to discuss issues.

No sitework on 11/25 and 11/26 due to the Thanksgiving holiday.

CHENANGO ACTIVITIES-

None.

PROJECT:	Flint Road Landfill Closure
OWNER:	Town of Charlton, Massachusetts
CONTRACTOR:	T. Ford Company Inc.
LOCATION:	Flint Road, Charlton, Massachusetts
WEATHER:	Cloudy TEMP: 30-62 F Work hours 0700-1500

NO. OF CONTRACT DAYS COMPLETED: (90 total)	35

T. FORD MANPOWER-
1-Superintendent
1-Operator
1-Laborer

T. FORD EQUIPMENT-
1-Komatsu PC300 Excavator
1-Komatsu PC150LC Excavator
1-Kubota Mini Excavator
1-CAT D6M Bulldozer
1-CAT 966G Loader
1-Volvo A25C End Dump Truck
2-Pickup Trucks
1-IR 100 Vibratory Roller
1-GPS System

CHENANGO CONTRACTING MANPOWER-
1-Superintendent
2-Laborers

CHENANGO CONTRACTING EQUIPMENT-
1-Pickup Truck
1-6 Wheel ATV
1-Trailer
2-Generators
Liner Seaming Equipment

T. FORD ACTIVITIES-

Contractor continued to shape and regrade the stormwater swale located on the south side of the site. The removed soils were transported to and stockpiled on the northeast side of the site. Continued to install geotextile fabric, 6″ of screened gravel and 1′ of rip rap as required to construct the stormwater swale.

Continued to shape and grade the anchor trench on the east side of the site.

No weekly progress meeting was held this week.

Town DPW employees on site to view the equipment and materials that BATG had left on site following their departure. No salvageable items were taken for reuse by the town and the disposal of all of the remaining items will now be the responsibility of the contractor.

No sitework on 12/3 due to rain.

Subcontractor – Bentley Warren on site to mobilize portable screener for on site soils on 11/30 and 12/1. The screening process was ceased on 12/1 due to the moisture content of the stockpiles soil and the slow speed at which the soils were able to be screened. The soil screening process may begin again at a future undetermined date.

CHENANGO ACTIVITIES-

RESIDENT ENGINEER'S WEEKLY REPORT DATE: 12-5-09

PROJECT:	Flint Road Landfill Closure
OWNER:	Town of Charlton, Massachusetts
CONTRACTOR:	T. Ford Company Inc.
LOCATION:	Flint Road, Charlton, Massachusetts
WEATHER:	Cloudy TEMP: 30-62 F Work hours 0700-1500

Continued to weld the 40 mil smooth FML LDPE inear flaps to cover the anchor trench around the landfill perimeter base. Performed the required QA/QC testing on the installed flaps. The flaps were installed at various widths to allow for the installation of screened gravel and riprap in the anchor trench at a later date.

Repaired (1) landfill gas vent boot using a 6" PVC coupling and on site textured HDPE liner material. Performed the required QA/QC testing on the repairs.

Removed the liner protection sand covering vent pipe V-3 to allow for inspection which did not appear to be damaged. No liner vent boot repair work will need to be performed at this location.

PROJECT:	Flint Road Landfill Closure
OWNER:	Town of Charlton, Massachusetts
CONTRACTOR:	T. Ford Company Inc.
LOCATION:	Flint Road, Charlton, Massachusetts
WEATHER:	Cloudy TEMP: 20-40 F Work hours 0700-1500

NO. OF CONTRACT DAYS COMPLETED: (90 total)	40

T. FORD MANPOWER-
1-Superintendent
1-Operator

T. FORD EQUIPMENT-
1-Komatsu PC300 Excavator
1-Komatsu PC150LC Excavator
1-Kubota Mini Excavator
1-CAT D6M Bulldozer
1-CAT 966G Loader
1-Volvo A25C End Dump Truck
2-Pickup Trucks
1-IR 100 Vibratory Roller
1-GPS System

CHENANGO CONTRACTING MANPOWER-
None-not on site this week, scheduled to return on 12/14

CHENANGO CONTRACTING EQUIPMENT-
1-6 Wheel ATV
1-Trailer
2-Generators
Liner Seaming Equipment

T. FORD ACTIVITIES-

Contractor continued to shape and grade the anchor trench on the east and south sides of the site, work was not completed.

Removed all trash from the field office trailer and began to remove trash from the site and placed the waste into an on site dumpster for disposal.

Began to remove scrap FML pieces along the edges of the landfill. Material will need to be placed into an on site dumpster for disposal.

Weekly progress meeting to discuss site issues was held this week. CDM concerns about the current project schedule were discussed with the contractor including their inefficiencies to make adequate progress when the weather was better earlier in the fall. The contractor stated that they still intend on completing their scope of work prior to the contract completion date of 1/13/10.

No sitework on 12/9 due to snow storm (4" total +/-).

Subcontractor – Bentley Warren on site to attempt to operate the portable screener for on site soils on 12/7. The screening process did not start again due to the moisture content of the stockpiled soil and the difficulty that it presents during the screening process. The soil screening process will now not continue until Spring, 2010 according to the contractor.

Completed punch list/list of ongoing work items for all tasks associated with the contract completion and discussed them with the contractors' superintendent which are listed as follows:

1. Level/regrade tire track gravel ruts on the east side of Flint road across from the access road to the site.
2. Complete landfill gas boot repairs as follows; V-1, V-2, V-5 – add FML riser section up to the bottom of the rubber strip on the vent pipe as previously constructed, V-3 - no action needed, V-4 – complete welds and add FML riser section up

PROJECT:	Flint Road Landfill Closure
OWNER:	Town of Charlton, Massachusetts
CONTRACTOR:	T. Ford Company Inc.
LOCATION:	Flint Road, Charlton, Massachusetts
WEATHER:	Cloudy TEMP: 20-40 F Work hours 0700-1500

to the bottom of the rubber strip on the vent pipe as previously constructed, V-6 – uncover top of broken PVC vent pipe and repair with a coupling if possible, if not possible, weld a section of FML over the hole to protect from erosion and install a new vent pipe in Spring, 2010.

3. Measure total rip rap off cap LF quantity installed upon work completion.
4. Complete all remaining FML repairs including QA/QC testing of all repairs.
5. Complete south side rip rap stormwater swale installation.
6. Add FML extension sections in areas where liner flap is too short.
7. Remove and dispose of all former BATG Environmental equipment off site.
8. Remove and dispose of all FML scrap debris from around the edges of the landfill.
9. Place and compact 6" of loam on all remaining slopes.
10. Place straw blanket on all loam slopes.
11. Final grade north and south access roadways to 2 % grade as required.
12. Stabilize FML for winter months.
13. Hydroseed all loam slopes in Spring, 2010.
14. Repair any erosion areas in Spring, 2010.
15. Receive as-built plan for flap installation from Chenango.
16. Complete site entrance area stabilization grading.
17. Measure total LF of FML anchor trench installed upon work completion.

CHENANGO ACTIVITIES-

None.

2011 Corrective Action Construction Daily Field Reports

CDM Smith

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 3, 2011
TEMP: 51° AM - 70° PM
WEATHER: Cloudy

(1) J. Bates and Son LLC.

- J. Bates screening the material at the Northeast corner of the landfill.
- Contractor installed filter fabric, 12" flat perforated panel pipe w/geo-textile sock, 2-6" diameter ABS pipe and covered them with 1 foot of stone and another layer of filter fabric sewn together on the West side of landfill so they can start to install an access road to the top.
- Contactor placing 3+ feet of the screened cover material in the area of the access road up to the top of the landfill.
- J. Bates has a Cat 235 excavator working with New England Liner helping with the installation of the geocomposite drainage layer.

(2) Subcontractor – New England Liner

- New England Liner on site at 7:30 AM to start the installation of the geocomposite drainage nets.
- New England Liner installed approx. 9350 SY of geocomposite drainage nets on the northeast section of the landfill.

(4) Payment Items

Item No. 3 F&I Bi-Planer Double Sided Drainage Geocomposite
Northeast section of landfill = 9350.00 +/- SY

Note: We had an informal job meeting at the Flint Road Landfill Site at 2:30 PM. The attendees were Laura Bugay - CDM, Ron Ford - CDM, J. Bates - J. Bates & Son, Peter McGown - J. Bates & Son, John Smith - J. Bates & Son, and Jim Malley - Charlton Board of Health.

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Owner
1 – Superintendant
2 – Operators
1 – Laborer

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – 966 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
1 – 31P Komatsu Dozer
1 – Power Screener
1 – Pick up

New England Liner 7AM to 3:30 PM

1 – Foreman
7 – Laborers

1 – Utility Truck
1 – Van
1 – Pick up
1 – 4 Wheeler
1 – Portable Generator

Signed _____
Ronald G. Ford

Resident Representative
CDM

CF: L. Storrs, Project Coordinator, **CDM**
Laura Bugay, Project Engineer, **CDM**

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 4, 2011
TEMP: 57° AM - 65° PM
WEATHER: Rain

(1) J. Bates and Son LLC.

- J. Bates screening the material at the Northeast corner of the landfill, started screening at 12:30 PM.
- Contractor installing the perimeter road anchor trench around the Northeast corner of the landfill.
- Contactor placing 3+ feet of the screened cover material in the area of the access road up to the top of the landfill placed filter fabric and placed a 1 foot layer of dense graded to stabilize the road to top of landfill.
- J. Bates has a Cat 235 excavator working with New England Liner helping with the installation of the geocomposite drainage layer.

(2) Subcontractor – New England Liner

- New England Liner on site installing the geocomposite drainage nets on the Southeast corner of the landfill.
- New England Liner installed approx. 9000 SY of geocomposite drainage nets.

(4) Payment Items

Item No. 3 F&I Bi-Planer Double Sided Drainage Geocomposite
Southeast section of landfill = 9000.00 +/- SY

Note: Heavy rain started around 11 AM and lasted throughout the afternoon.

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Superintendant
2 – Truck Drivers
2 – Operators
2 – Laborer

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – 966 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
1 – 31P Komatsu Dozer
1 – Power Screener
1 – Pick up

New England Liner 7AM to 3:30 PM

1 – Foreman
7 – Laborers

1 – Utility Truck
1 – Van
1 – Pick up
1 – 4 Wheeler
1 – Portable Generator

Signed _____
Ronald G. Ford

Resident Representative
CDM

CF: L. Storrs, Project Coordinator, CDM
Laura Bugay, Project Engineer, CDM
I

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 5, 2011
TEMP: 44° AM - 65° PM
WEATHER: Cloudy

(1) J. Bates and Son LLC.

- J. Bates screening the material at the Northeast corner of the landfill, started screening at 9:30 PM.
- Contractor installing the perimeter road anchor trench around the Southeast corner and South side of the landfill.
- Contactor started to place the 1 foot layer of rip rap in the perimeter road anchor trench around the Northeast corner of the landfill.
- J. Bates has a Cat 235 excavator working with New England Liner helping with the installation of the geocomposite drainage layer.

(2) Subcontractor – New England Liner

- New England Liner on site installing the geocomposite drainage nets on the South side of the landfill.
- New England Liner installed approx. 2000 SY of geocomposite drainage nets.
- New England Liner stopped work at 10 AM today due to the high wind condition.

(4) Payment Items

Item No. 3 F&I Bi-Planer Double Sided Drainage Geocomposite
South section of landfill = 2000.00 +/- SY

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Superintendant
1 - Owner
3 – Operators
2 – Laborer

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – 966 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
1 – 31P Komatsu Dozer
1 – Power Screener
1 – Pick up

New England Liner 7AM to 10AM

1 – Foreman
7 – Laborers

1 – Utility Truck
1 – Van
1 – Pick up
1 – 4 Wheeler
1 – Portable Generator

Signed _____
Ronald G. Ford

Resident Representative
CDM

CF: L. Storrs, Project Coordinator, CDM
Laura Bugay, Project Engineer, CDM
I

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 6, 2011
TEMP: 45° AM - 65° PM
WEATHER: Clear

(1) J. Bates and Son LLC.

- J. Bates and Son were not on site today.

(2) Subcontractor – New England Liner

- New England Liner on site installing the geocomposite drainage nets on the South side of the landfill.
- New England Liner installed approx. 7400 SY of geocomposite drainage nets.

(4) Payment Items

Item No. 3 F&I Bi-Planer Double Sided Drainage Geocomposite
South section of landfill = 7400.00 +/- SY

(11) Contractors Workforce

J. Bates & Son NA

New England Liner 7AM to 3:30AM

1 – Foreman
7 – Laborers

1 – Utility Truck
1 – Van
1 – Pick up
1 – 4 Wheeler
1 – Portable Generator

Signed _____
Ronald G. Ford

Resident Representative
CDM

CF: L. Storrs, Project Coordinator, CDM
Laura Bugay, Project Engineer, CDM
I

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 10, 2011
TEMP: 50° AM - 56° PM
WEATHER: Cloudy

(1) J. Bates and Son LLC.

- J. Bates has the Cat 235 excavator picking through the stockpile of material at the top of the landfill. They are removing any rocks and debris and then spreading the material over the geocomposite with the Komatsu 31PX dozer.
- Contractor installing the perimeter road anchor trench around the Northwest corner of the landfill.
- Contactor placing the 1 foot layer of rip rap in the perimeter road anchor trench around the North and South side of the landfill.
- J. Bates has a Cat 235 excavator working with New England Liner helping with moving the rolls of geocomposite to the top of the landfill.
- J. Bates removed the 3 jersey barriers from the top of the landfill.

(2) Subcontractor – New England Liner

- New England Liner on site installing the geocomposite drainage nets on the West side of the landfill.

- New England Liner installed approx. 2400 SY of geocomposite drainage net today and they installed approx. 8700 SY on May 9, 2011.
- New England Liner stopped work at 10 AM today due to the high wind condition.
- New England Liner cleaned up their trash and secured the geocomposite with sandbags before leaving for the day.

(4) Payment Items

Item No. 3 F&I Bi-Planer Double Sided Drainage Geocomposite
South section of landfill = 11000.00 +/- SY

(9) Visitors

Had an informal job meeting at the landfill site at 2:30 PM.
Attendees:

Jim Mally	- Charlton Board of Health
~~Bill~~ Willard Stevens	- Charlton Board of Health
Laura Bugay	- CDM
Bruce Haskell	-CDM
Ronald Ford	-CDM
John Smith	- J. Bates & Son
Pete McGown	- J. Bates & Son
John Bates	- J. Bates & Son

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Superintendant
2 - Laborers
2 – Operators

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
2 – 31P Komatsu Dozer
1 – Power Screener
1 – Van

New England Liner 7AM to Noon

1 – Foreman
7 – Laborers

1 – Utility Truck
1 – Van
1 – Pick up
1 – 4 Wheeler
1 – Portable Generator

Signed _____
Ronald G. Ford

Resident Representative
CDM

CF: L. Storrs, Project Coordinator, CDM
Laura Bugay, Project Engineer, CDM
I

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 11, 2011
TEMP: 50° AM - 62° PM
WEATHER: Showers

(1) J. Bates and Son LLC.

- J. Bates has the Cat 235 excavator picking through the stockpile of material at the top of the landfill. They are removing any rocks and debris and then spreading the material over the geocomposite with the Komatsu 31PX dozer.
- Contactor placing the 1 foot layer of rip rap in the perimeter road anchor trench around the East side of the landfill.
- J. Bates started to spread the 12" layer of screened barrier protection material at the East side of the landfill. They are placing the material with the 245 Cat excavator.

(2) Subcontractor – New England Line

NA

(4) Payment Items

NA

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Superintendant
2 - Laborers
2 – Operators

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
2 – 31P Komatsu Dozer
1 – Power Screener
1 – Van

New England Liner NA

Signed _____
Ronald G. Ford

Resident Representative
CDM

CF: L. Storrs, Project Coordinator, **CDM**
Laura Bugay, Project Engineer, **CDM**
I

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 12, 2011
TEMP: 48° AM - 68° PM
WEATHER: Clear

(1) J. Bates and Son LLC.

- J. Bates has the Cat 235 excavator picking through the stockpile of material at the top of the landfill. They are removing any rocks and debris and then spreading the material over the geocomposite with the Komatsu 31PX dozer.

- J. Bates spreading the 12" layer of screened barrier protection material at the East side of the landfill. They are placing the material with the 245 Cat excavator from the perimeter road.

(2) Subcontractor – New England Liner

NA

(4) Payment Items

NA

(11) Contractors Workforce

J. Bates & Son — 7AM to 5PM

1 – Superintendant
2 - Laborers
2 – Operators

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
2 – 31P Komatsu Dozer
1 – Power Screener
1 – Van

New England Liner — NA

Signed _____
Ronald G. Ford

Resident Representative
CDM

CC: L. Storrs, Project Coordinator, **CDM**
Laura Bugay, Project Engineer, **CDM**

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 17, 2011
TEMP: 46° AM - 50° PM
WEATHER: Rain

(1) J. Bates and Son LLC.

- J. Bates has the Cat 235 excavator picking through the stockpile of material at the top of the landfill. They are removing any rocks and debris and then spreading the material over the geocomposite with the Komatsu 31PX dozer.

- J. Bates spreading the 12" layer of screened barrier protection material at the East side of the landfill. They are placing the material with the 245 Cat excavator from the perimeter road.

(2) Subcontractor – New England Line

NA

(4) Payment Items

NA

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Superintendant
2 - Laborers
2 – Operators

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
2 – 31P Komatsu Dozer
1 – Power Screener
1 – Van

New England Liner NA

Signed _____
Ronald G. Ford

Resident Representative
CDM

CC: L. Storrs, Project Coordinator, **CDM**
Laura Bugay, Project Engineer, **CDM**

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 18, 2011
TEMP: 50° AM - 53° PM
WEATHER: Rain

(1) J. Bates and Son LLC.

- J. Bates has the Cat 235 excavator picking through and moving the stockpile of material at the top of the landfill, exposing the existing liner to assure that it is in good condition.
- Contractor using the excavator and hand shovels to remove the layer of sand that is directly on top of the liner.
- The contractor has made some small tears in the existing liner due to wrinkles and small depressions, upon completion of exposing the liner, the contractor clean off the liner inspect it for damage and repair those sections.

(2) Subcontractor – New England Line ✓

NA

(4) Payment Items

NA

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Superintendant
2 - Laborers
3 – Operators

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
2 – 31P Komatsu Dozer
1 – Power Screener
1 – Van

New England Liner NA

Signed _____
Ronald G. Ford

Resident Representative
CDM

CC: L. Storrs, Project Coordinator, **CDM**
Laura Bugay, Project Engineer, **CDM**

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 19, 2011
TEMP: 50° AM - 60° PM
WEATHER: Rain

(1) J. Bates and Son LLC.

- J. Bates has the Cat 235 excavator picking through and moving the stockpile of material at the top of the landfill, exposing the existing liner to assure that it is in good condition.
- The contractor has made some small tears in the existing liner due to wrinkles and small depressions.
- The contractor completed moving the stockpiled of material, and will clean off the liner next week and repair the bad sections.

(2) Subcontractor – New England Line ✓

NA

(4) Payment Items

NA

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Superintendant
2 - Laborers
3 – Operators

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
2 – 31P Komatsu Dozer
1 – Power Screener
1 – Van

New England Liner NA

Signed _____
Ronald G. Ford

Resident Representative
CDM

CC: L. Storrs, Project Coordinator, CDM
Laura Bugay, Project Engineer, CDM

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 24, 2011
TEMP: 62° AM - 80° PM
WEATHER: Fog

(1) J. Bates and Son LLC.

- J. Bates working on the south side of the landfill, cleaning up stone that washed down the perimeter road anchor trench.
- Contractor hauling the screened barrier protection material from the stockpile to the top of the landfill, and spreading with the D-6 dozer.

(2) Subcontractor – New England Line

NA

(4) Payment Items

NA

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Superintendant
4 - Laborers
3 – Operators

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
2 – 31P Komatsu Dozer
1 – Power Screener
1 – Van

New England Liner NA

Signed _____
Ronald G. Ford

Resident Representative
CDM

CC: L. Storrs, Project Coordinator, **CDM**
Laura Bugay, Project Engineer, **CDM**

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: May 31, 2011
TEMP: 67° AM - 80° PM
WEATHER: Clear

(1) J. Bates and Son LLC.

- J. Bates screening the barrier protection material at the NE corner of the landfill. The screener broke down at 1:45 PM.
- Contractor hauling the rolls of geocomposite to the top of the landfill for NE Liner.
- Contractor cleaning up trash and debris around the landfill site and discarding in the dumpster.
- Bates hauling in loam and stockpiling at the SE corner of the landfill.
- Bates received 2 loads of paper fiber to the site. They mixed the paper fiber and loam together at a 1to 1 ratio.
- Contractor repaired existing vent no. 6 at the SE corner of the landfill; they also repaired torn section of liner at vent no. 4 and vent no. 6.

(2) Subcontractor – New England Line

- NE liner repaired the holes and small tears in existing liner that had the stockpiled material on it.

- NE Liner installed the 4,160 SY of geocomposite on the North Slope of the landfill.

- They need to order approx. 8 more rolls of geocomposite to finish the landfill

(4) Payment Items

Item No. 3 F&I Bi-Planer Drainage Geocomposite
North Slope = 4160.00 SY

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Superintendant
4 - Laborers
3 – Operators

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
2 – 31P Komatsu Dozer
1 – Power Screener
1 – Van

New England Liner 7AM to 2PM

1 – Foreman
9 - Laborers

1 – Portable Generator
1 – Pick up
1 - Van

Signed _____
Ronald G. Ford

Resident Representative
CDM

CC: L. Storrs, Project Coordinator, CDM

CDM
50 Hampshire Street
Cambridge, MA 02139

ENGINEER'S DAILY REPORT

Town of Charlton Massachusetts
Flint Road Landfill
Landfill Closure
September 2010

DATE: June 7, 2011
TEMP: 65° AM - 85° PM
WEATHER: Clear

(1) J. Bates and Son LLC.

- J. Bates has the screener up and running at 1 pm today, it has been down since May 31, 2011.
- Bates hauling in loam and stockpiling at the SE corner of the landfill.
- Bates received 4 loads of paper fiber to the site. They mixed the paper fiber and loam together at a 1 to 1 ratio.
- Pete McGown and I checked out the wetland restoration area #2 to determine the limits of work to be completed. The Standard Oil Co. needs to complete the mark out of their easement before we can start any work in that area.

Note: We had a job meeting at the landfill site at 2 PM.

Attendees: John Bates – J. Bates & Sons
John Smith – J. Bates & Sons
Pete McGown – J. Bates & Sons
Laura Bugay – CDM
Ronald Ford - CDM

(2) Subcontractor – New England Line

- NA

(4) Payment Items

- NA

(11) Contractors Workforce

J. Bates & Son 7AM to 5PM

1 – Superintendant
1 - Mechanic

2 – D400 Cat Rock Trucks
1 – 345 Cat Excavator
1 – 235 Cat Excavator
1 – 980 Cat Loader
1 – D6 Cat Dozer
1 – 563 Cat Vib. Roller
2 – 31P Komatsu Dozer
1 – Power Screener
1 – Van

New England Liner

- NA

Signed _____
Ronald G. Ford

Resident Representative
CDM

CC: L. Storrs, Project Coordinator, **CDM**
Laura Bugay, Project Engineer, **CDM**

Appendix K

Replacement Monitoring Well Logs

CDM Smith
50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000

MONITORING WELL DETAIL
MW-1SR

Client: Town of Charlton
Project Name: Charlton Landfill
Project Location: Charlton, MA
Project Number: 75398-72037

Drilling Contractor: Geosearch, Inc
Surface Elevation (ft.): NM
Drilling Method/Rig: HSA/Roller Bit/CME-850 Track Mounted
Total Depth (ft.): 46.5
Drillers: J. Keenan
Depth to Initial Water Level (ft. BGS): NM
Drilling Date: Start: 7/28/2011 **End:** 7/29/2011
Development Method: Not Yet Completed
Borehole Coordinates:
Field Screening Instrument: N/A
N E
Logged By: C. Houde
Development Date: Start N/A **End** N/A
Top of Riser Elevation (ft.): NM

Stratum Designation	Material Description	Graphic Log	Elev. Depth (ft.)	Well Construction Detail
				Protective Casing NM
				Ground Surface
FILL	(0-4') FILL		0	
GPS	(4-10') GRAVEL and SAND		5	(0-30.5') Grout
BEDROCK	(10-20') BEDROCK		10	
			15	(0-33.5') 2" Schedule 40 PVC Riser
BEDROCK	(20-46.5') FRACTURED BEDROCK		20	
			25	
			30	(30.5-31.5') Medium Bentonite Chip Seal
			35	(31.5-46.5') #2 Silica Sand
			40	(33.5-46') 2" (.01") Slot Schedule 40 PVC Screen
			45	
	End of Exploration at 46.5' BGS			Bottom of Well at 46' BGS

REMARKS

-BGS: Below Ground Surface
-HSA: Hollow Stem Auger
-N/A: Not Applicable
-NM: Not Measured

Reviewed by: N. Castonguay **Date:** 1/15/2013

CARLOW COUNTY LOG CHARLTON LANDFILL_2013.GPJ CDM_MA.GDT 1/15/13

CDM Smith
50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000

MONITORING WELL DETAIL
MW-2SR

Client: Town of Charlton
Project Name: Charlton Landfill
Project Location: Charlton, MA
Project Number: 75398-72037

Drilling Contractor: Geosearch, Inc
Surface Elevation (ft.): NM
Drilling Method/Rig: HSA/Roller Bit/CME-850 Track Mounted
Total Depth (ft.): 12.5
Drillers: J. Keenan
Depth to Initial Water Level (ft. BGS): NM
Drilling Date: Start: 7/26/2011 **End:** 7/27/2011
Development Method: Not Yet Completed
Borehole Coordinates:
Field Screening Instrument: N/A
N E
Logged By: C. Houde
Development Date: Start N/A **End** N/A
Top of Riser Elevation (ft.): NM

Stratum Designation	Material Description	Graphic Log	Elev. Depth (ft.)	Well Construction Detail
				Protective Casing NM
				Ground Surface
GP	(0-8.5') GRAVEL and LOAM		0	(0-0.5') Concrete
				(0.5-2') 2" Schedule 40 PVC Riser
			5	(0-12.5') #2 Silica Sand
BLDR	(8.5-12.5') BOULDER		10	(2-12') 2" (.01") Slot Schedule 40 PVC Screen
	End of Exploration at 12.5' BGS			Botton of Well at 12' BGS
			15	
			20	
			25	

REMARKS

-BGS: Below Ground Surface
-HSA: Hollow Stem Auger
-N/A: Not Applicable
-NM: Not Measured

Reviewed by: N. Castonguay **Date:** 1/15/2013

CARLOW COUNTY LOG CHARLTON LANDFILL_2013.GPJ CDM_MA.GDT 1/15/13

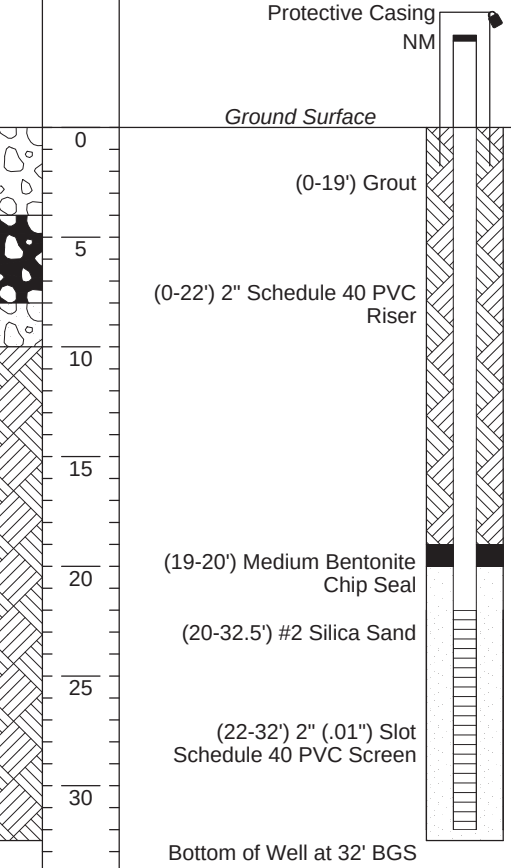
CDM Smith
50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000

MONITORING WELL DETAIL
MW-2DR

Client: Town of Charlton
Project Name: Charlton Landfill
Project Location: Charlton, MA
Project Number: 75398-72037

Drilling Contractor: Geosearch, Inc
Surface Elevation (ft.): NM
Drilling Method/Rig: HSA/Roller Bit/CME-850 Track Mounted
Total Depth (ft.): 32.5
Drillers: J. Keenan
Depth to Initial Water Level (ft. BGS): NM
Drilling Date: Start: 7/27/2011 **End:** 7/27/2011
Development Method: Not Yet Completed
Borehole Coordinates:
Field Screening Instrument: N/A
N E
Logged By: C. Houde
Development Date: Start N/A **End** N/A
Top of Riser Elevation (ft.): NM

Stratum Designation	Material Description	Elev. / Depth (ft.)
GP	(0-4') GRAVEL and LOAM	0
BLDR	(4-8') BOULDER	5
GPS	(8-10') GRAVEL and SAND	
BEDROCK	(10-32.5') BEDROCK	10, 15, 20, 25, 30
	End of Exploration at 32.5' BGS	



REMARKS

-BGS: Below Ground Surface
-HSA: Hollow Stem Auger
-N/A: Not Applicable
-NM: Not Measured

Reviewed by: N. Castonguay **Date:** 1/15/2013

CARLOW COUNTY LOG CHARLTON LANDFILL_2013.GPJ CDM_MA.GDT 1/15/13

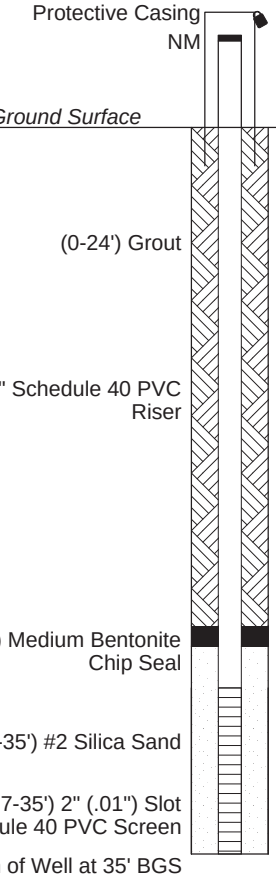
CDM Smith
50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000

MONITORING WELL DETAIL
MW-3DR

Client: Town of Charlton
Project Name: Charlton Landfill
Project Location: Charlton, MA
Project Number: 75398-72037

Drilling Contractor: Geosearch, Inc
Surface Elevation (ft.): NM
Drilling Method/Rig: HSA/Roller Bit/CME-850 Track Mounted
Total Depth (ft.): 35
Drillers: J. Keenan
Depth to Initial Water Level (ft. BGS): NM
Drilling Date: Start: 7/26/2011 **End:** 7/26/2011
Development Method: Not Yet Completed
Borehole Coordinates:
Field Screening Instrument: N/A
N E
Logged By: C. Houde
Development Date: Start N/A **End** N/A
Top of Riser Elevation (ft.): NM

Stratum Designation	Material Description	Elev. Depth (ft.)
FILL	(0-5') LOAM and BACKFILL	0
GPS	(5-10') GRAVEL and SAND	5
GPS	(10-15') GRAVEL and SAND	10
ML-SM	(15-20') SILT, some sand and gravel	15
SM	(20-24') SAND and SILT	20
BLDR	(24-27') BOULDER	25
ML-SM	(27-35') SAND and SILT	30
	End of Exploration at 35' BGS	35



REMARKS

-BGS: Below Ground Surface
-HSA: Hollow Stem Auger
-N/A: Not Applicable
-NM: Not Measured

Reviewed by: N. Castonguay **Date:** 1/15/2013

CARLOW COUNTY LOG CHARLTON LANDFILL_2013.GPJ CDM_MA.GDT 1/15/13

CDM Smith
50 Hampshire Street
Cambridge, MA 02139
Tel: (617) 452-6000

MONITORING WELL DETAIL
GP-4R

Client: Town of Charlton
Project Name: Charlton Landfill
Project Location: Charlton, MA
Project Number: 75398-72037

Drilling Contractor: Geosearch, Inc
Surface Elevation (ft.): NM
Drilling Method/Rig: HSA/CME-850 Track Mounted
Total Depth (ft.): 25
Drillers: J. Keenan
Depth to Initial Water Level (ft. BGS): 21
Drilling Date: Start: 7/28/2011 **End:** 7/28/2011
Development Method: N/A
Borehole Coordinates:
Field Screening Instrument: N/A
N E
Logged By: C. Houde
Development Date: Start N/A **End** N/A
Top of Riser Elevation (ft.): NM

Stratum Designation	Material Description	Graphic Log	Elev. Depth (ft.)	Well Construction Detail
				Protective Casing NM *Ground Surface*
FILL	(0-20') FILL		0	(0-0.5') Concrete (0.5-3') #2 Silica Sand (3-5') Medium Bentonite Chip Seal (0-6') 2" Schedule 40 PVC Riser (5-25') #2 Silica Sand (6-20') 2" (.01") Slot Schedule 40 PVC Screen
			5	
			10	
			15	
MLS	(20-25') SAND and SILT		20	Bottom of Well at 20' BGS
	End of Exploration at 25' BGS		25	

REMARKS

-BGS: Below Ground Surface
-HSA: Hollow Stem Auger
-N/A: Not Applicable
-NM: Not Measured

Reviewed by: N. Castonguay **Date:** 1/15/2013

CARLOW COUNTY LOG CHARLTON LANDFILL_2013.GPJ CDM_MA.GDT 1/15/13

CDM Smith

cdmsmith.com