



CLOUGH HARBOUR & ASSOCIATES LLP

June 30, 2008

Mr. Angelo A. Marcuccio
Environmental Analyst
Div. of Environmental Permits, Region 4
1130 North Westcott Road
Schenectady, New York 12306-2014

**RE: Rapp Road Waste Management Facility – DEC # 4-0101-171/11
Eastern Landfill Expansion Part 360 Permit Application – Addendum No. 2
Response to April 18, 2008 DEC Notice of Incomplete Application
CHA Project No. 12206.4005.1502**

Dear Mr. Marcuccio:

Clough Harbour & Associates LLP (CHA) is in receipt of your letter dated April 18, 2008 which contains comments based on the NYSDEC technical review of Addendum No. 1 to the 6 NYCRR Part 360 Permit Application prepared by CHA on behalf of the City of Albany for the Rapp Road Solid Waste Management Facility Eastern Landfill Expansion.

Based on our review of the comments included in the April 18, 2008 letter (following in bold print), CHA offers the following responses (in italics) on behalf of the City. The following comments/responses are numbered in accordance with the comments/responses included in Addendum No. 1 to the 6 NYCRR Part 360 Permit Application where additional information has been requested by the DEC, and numbered sequentially for new comments provided by the DEC.

Part 360 Permit Application -Section 4: Engineering Report

- 6. Solid Waste staff has been directly involved in discussions between the City and the Albany County Sewer District in their obtaining this agreement. If necessary, the department will make the acquiring of this agreement a condition of operating the new cell, if and when a permit is issued. The City is aware of this potential requirement as part of a permit, if it is issued.**

The comment is noted. The City will continue to pursue a written agreement with the Albany County Sewer District, and will transmit a copy of the agreement to the DEC when available.

- 9. This comment is related to a variance approval for the City to omit a gas venting layer from closure cap designs. Our technical comment was for the application to include a copy of this approval if it is being referenced in this document. It has not been included in these responses, it is only stated that it will be included. Why hasn't a copy been provided?**

Section 3.1 of the Engineering Report included in the 6 NYCRR Part 360 Permit Application for the Eastern Landfill Expansion has been revised to reference the Special Condition 27 Paragraph D of the current 6 NYCRR Part 360 Permit for the Rapp Road Solid Waste Management Facility, which states that an “**equivalent design**” previously approved by the Department eliminates the need for a gas venting layer with the use of an active gas collection/control system. The revised text on page 28 of the Engineering report and page 8 of the current 6 NYCRR Part 360 Permit for the facility are included as Attachment 1.

- 13. The document needs to have tabs on appendices and in general throughout the application. Staff should not have to go searching for items/pages.**

The comment is noted.

- 14. A table of contents of “sorts” has been included, but it is not helpful when it cannot be used to locate the different sections when searching through this portion of the application. Tabs need to be included to facilitate going back and forth between comments and sections of this part of the application.**

The comment is noted.

- 15. The application needs to contain a statement that states the specifications found in either the *Technical Specifications* or in the *Construction Quality Assurance/Quality Control Plan* will be final word on work and/or material specifications, if differences are encountered.**

The work and material specifications in the technical specifications and the Construction Quality Assurance/Quality Control Plan were thoroughly reviewed for consistency with respect to each other and 6 NYCRR Part 360. However, in the event that a discrepancy is discovered between the technical specifications and the Construction Quality Assurance/Quality Control Plan during construction, the technical specifications will govern the construction. No construction will violate the requirements of 6 NYCRR Part 360.

- 17. Must include in discussions contained in 02206 under field quality assurance that the results of the permeability-moisture-density curve will be considered when performing moisture and density testing.**

Paragraph 3.3(E) has been added to Specification Section 02206 to require that the moisture/density envelope developed from the moisture, density and permeability testing be used as a guide during placement and compaction of the low permeability soil. The revised specification section is included as Attachment 2.

Part 360 Permit Application - Section 5: Construction Quality Assurance/Quality Control Plan

- 2. Construction Quality Assurance/Quality Control Plan, 3.1 Engineer's Role, 13. Engineer's Project Representation: Has no minimum qualifications, will there be any? Will there be a minimum standard for assessing experience and training for these individuals?**

The Engineer's on-site project representation will meet the minimum requirements of construction observation staff as outlined in Section 3.2C. – "Construction Observation Staff: The construction observation staff will be qualified by experience and technical training to perform construction observation of specific components of landfill construction. This individual(s) will be a degreed engineer(s) or at a minimum have at least two years of construction inspection experience. The revised text on pages 10 & 11 of the CQA/CQC Plan is included in Attachment 3.

- 3. Construction Quality Assurance/Quality Control Plan, 3.4 Contractor's Personnel: This response has the word "should" in it; will the minimum at least five (5) years of field construction experience" be an absolute requirement? If not, will there be an absolute minimum qualification for this individual? The conflict resolution is acceptable. We recommend that the points of this discussion are made a specific part of the preconstruction meeting.**

Section 3.4 has been revised to state that "The Contractor's QC Manager shall have at a minimum at least five (5) years of field construction experience. Two of the five years of experience shall include new landfill construction, expansion or closure projects."

In Section 2.1 Preconstruction Meeting, the discussion of conflict resolution procedures has been added to the topics to be covered. The revised text on pages 7 & 11 of the CQA/CQC Plan is included in Attachment 3.

- 8. Construction Quality Assurance/Quality Control Plan, 3.7.1.4 Documentation: The general daily observation form was not found among the forms provided.**

A CHA Construction Observation Report will serve as the general daily observation form and a copy of this form is included as Attachment 4.

Part 360 Permit Application - Section 7: Contingency Plan

- 1. In general, most of the items required by 360-2.10(b)(1) were adequately addressed. The exception appeared to be confined space entry and specific discussions related to equipment available for contingency responses. Further response is needed.**

The City of Albany, Department of General Services, Confined Space Entry Plan details confined space entry procedures at the facility and is maintained at the facility office at all times for reference. Specific equipment to respond to contingency are outlined in the City of Albany, Department of General Services, Safety and Health Manual and Confined Space Entry Plan.

Engineering Drawings

- 8. When considering the lowest bottom elevation given for the subgrade on drawing G-7 of 296 feet, against an extrapolated high groundwater level using data from December 2007 for monitoring wells 10 and 15, we believe there is the possibility the separation at that time could have been as little as 3½ feet. Whether our numbers are exactly accurate or not, the real point here is placing the bottom liner elevation at 296 feet is leaving little or no room for a rise of elevation of the pre-existing groundwater elevations before this separation requirement will be compromised.**

CHA completed a round of groundwater sampling and groundwater level measurements at the landfill site on 9/17/07. Due to analytical laboratory calibration problems, the laboratory data could not be validated. Subsequently, Upstate Laboratories provided the labor and equipment to conduct an additional round of sampling and water level measurements on 12/04/07 at no cost to the City. The water levels from this round of sampling appear to be two feet higher in each monitoring well at the site, relative to previous water level readings. These numbers are the basis for the apparent 3.5-foot groundwater separation cited in the above comment.

CHA contacted Upstate Laboratories regarding the water level data collected on 12/04/07. Upstate informed CHA that a new water level meter had been used for the first time during that sampling event. After checking the equipment for proper function, Upstate informed CHA that the measuring tape on the meter was incorrectly labeled by exactly two feet. A copy of the correspondence between Upstate Laboratories and the water level meter manufacturer regarding the defective meter is included as Attachment 5.

Using the highest water levels from individual wells obtained during all other sampling rounds; CHA has determined that the minimum groundwater/liner separation is 5.5 to 6 feet. Also note that the minimum separation occurs in the vicinity of the landfill sumps only; and the separation distance is greater over the remainder of the landfill cell area; approaching a maximum of about 15 feet in the east corner of the proposed expansion cell. Also note that all rounds of sampling between 3/24/03 and 1/09/08 show a maximum groundwater level fluctuation of approximately 1.75 feet across the site.

It is CHA's opinion that the required groundwater separation, as well as liner stability from a buoyancy perspective during and after construction, will be maintained.

New comments associated with submission of revised sections of the application

- 1. Revised calculations provided, Static Loading on Primary Leachate Collection Pipes and Bearing Capacity type failure give maximum waste heights of 120 feet and 170 feet, respectively. Not clear why there would be a difference for this parameter in these two different calculations.**

The maximum height of 170 feet used for the bearing capacity calculations represents the maximum height of waste that will exist at the site upon closure including the overfill area, adjacent to the new Eastern Landfill Expansion liner system. Specifically, the area below the

existing landfill is critical with regard to subgrade stability. The maximum height of 120 feet used in the calculation of static loading on the leachate collection pipes for the Eastern Landfill Expansion represents the maximum waste height that will exist at closure over the proposed expansion liner system. Section A-A' on Engineering Drawing G-12 depicts the final waste heights described herein. A copy of Drawing G-12 is included as Attachment 6 for reference.

- 2. In the CQA/QC Plan under "Chain of Command", has it been decided if a member of the Engineer's staff must be present on site if the contractor is onsite, regardless of what work is being performed?**

The following statement has been added to Section 3.1.D "The Project Engineer or a representative of the Engineer's staff will be on-site when the Contractor is on site regardless of what work is being performed". The revised text on page 10 of the CQA/CQC Plan is included in Attachment 3.

- 3. In the CQA/QC Plan under 3.7.1.2, what exactly is intended with the word "random" in the context of testing observation frequencies? Perhaps it could be termed testing will be observed unannounced, but that all testing will receive a degree of observation. This discussion leaves one with the feeling that there is the possibility that some of the critical testing/sampling might not receive full observation.**

Section 3.7.1.2 has been modified as follows "Test performed and samples obtained in the field by the Contractor or the Contractor's testing laboratory will be observed by the Engineer or Engineer's Observation Staff. In general, these observations by the Engineer or Engineer's Observation Staff will be unannounced. The Engineer or Engineer's Observation Staff will observe a portion of tests and sampling required to verify that the proper testing and sampling procedures are being followed. Geomembrane liner inspections will require full time observation by the Engineer or Engineer's Observation Staff." The revised text on page 15 of the CQA/CQC Plan is included in Attachment 3.

- 4. In the CQA/QC Plan under 3.7.3.2, look at the test requirements in relation to those required under 360-2.13(j)(3)(I). It appears the deleted requirement for a lab permeability should not have been removed from this list, simply the moisture-density-permeability relationship comparison needed to be added. Review both of these two references and assure they are similar.**

Section 3.7.3.2 has been revised to include a laboratory permeability test. Both references have been reviewed to assure they are similar. The revised text on page 22 of the CQA/CQC Plan is included in Attachment 3.

- 5. In the CQA/QC Plan under 3.7.4.2.F3.b.2, the reference should be 3.7.4.2."E", not "D". It is easy to make reference mistakes and this is only pointed out to request the CQC/QC Plan be reviewed for the sole purpose of assuring references are to the correct sections of the plan. In this case the situation directed an individual to use "nondestructive" testing methods when it was "destructive" testing that was called for.**

In Section 3.7.4.2.F3.b.2, the reference has been changed to 3.7.4.2.E. The CQC/QC Plan has been reviewed to assure references are to the correct sections of the plan. The revised text on page 33 of the CQA/CQC Plan is included in Attachment 3.

- 6. In the CQA/QC Plan under 3.7.5.2, please specify that the sample to be taken for the testing in this case will be acquired once the material arrives at the site, after it has been transported.**

Section 3.7.5.2 has been updated as follows "The following tests shall be performed at the landfill site on the material after it is brought from the borrow source and transported to the site, at the frequencies listed below". The revised text on page 35 of the CQA/CQC Plan is included in Attachment 3.

Part 360 Permit Application - Section 8: Hydrogeologic Investigation Report

Section 5.0 Groundwater Quality section 5.2 Existing AIL/ Wedge/ P-4 Water Quality -

The CHA proposal to continue monitoring of MW-12S is acceptable, however we would like the City to investigate the recycling/maintenance building with regards to historical maintenance activities and/or other releases to the soil and groundwater. Construction of a landfill cell over this area without investigation would preclude source removal as potential remedial alternative.

We envision a simple investigation utilizing PID analyses around the perimeter of the slab prior to demolition and during slab removal. We would also expect a thorough visual observation of all excavated materials.

CHA will incorporate a simple investigation as part of the construction documents. CHA will prepare and submit to the Department for review and approval prior to construction, an investigation Work Plan to investigate the maintenance/recycling building subgrade soils. The objective of the Work Plan will be to determine if there have been any releases associated with the historical operations of the building that may have negatively impacted the soil and/or groundwater beneath the building. At a minimum, the Work Plan will detail an investigation program that will include the installation of a series of manually driven probes around the perimeter of the foundation. At each probe location, the shallow subsurface soil gas will be screened using a photoionization detector to evaluate the presence of subsurface contamination. In addition, during the planned building demolition and associated concrete building slab removal activities, the subsurface soils beneath the slab will also be screened for the presence of visual, olfactory, and photoionic evidence of contamination.

The following comments were prepared by staff from the Division of Solid and Hazardous Materials at the department's headquarters office in Albany:

- 3. The responses regarding the elevated secondary leachate leakage rates in cells 8 and 9 which occurred between October 2006 and January 2007 adequately explain those incidents.**



The damage to the cell 10 pump station which was referred to in the response apparently occurred around July 21, 2006 and remained until about February 7, 2007, based on the period during which no secondary leachate data was provided. The functioning of the cell 10 secondary leachate removal system was apparently restored at that point. The leachate data from that point indicates daily leakage rates which trended generally downward from 93.5 gallons/acre-day to 29.3 gallons/acre-day on March 28, 2007 as the secondary leachate which had accumulated in cell 10 over the previous months was removed. During this period the 30-day average leakage rates decreased from 93.5 gallons/acre-day (which was apparently actually a one-day average since there were no recent previous data) to 39.6 gallons/acre-day.

On March 29, 2007 there was apparently, based on the leachate data provided and on Clough Harbour's response, another pump station failure which prevented the removal of secondary leachate from cell 10. Based on the leachate collection data provided, this situation continued until October 18, 2007. At that point, functioning of the cell 10 secondary leachate collection and removal system was apparently restored.

The data provided indicate that the daily secondary leachate volumes trended generally downward from 53.6 gallons/acre-day on October 18, 2007 to 35.0 gallons/acre-day on December 12, 2007. Likewise, the 30-day average secondary leachate leakage trended generally downward from 53.6 gallons/acre-day (again apparently actually a one-day average since there were no recent previous data) on October 18, 2007 to 31.3 gallons/acre-day on December 12, 2007.

According to the leachate data provided, another pump problem prevented the collection of data for the cell 10 secondary leachate collection system from December 13, 2007 through January 15, 2008, which is the most recent data on leachate collection we have for the Albany Landfill in the DEC Central Office. According to Clough Harbour's April 3, 2008 response, the pump station has since been repaired and leakage rates were trending downward to 22.8 gallons/acre-day as of March 25, 2007 (sic. apparently intended to be March 25, 2008).

In addition to problems with cell 10, as indicated in leachate data provided and in Clough Harbour's response, cell 11 suffered a meter malfunction between April 12, 2007 and May 30, 2007 which precluded the measurement of secondary leachate for that cell. In addition, between July 4, 2007 and October 20, 2007 the 30-day average secondary leachate leakage rates in cell 11 were above the 20 gallons/acre-day limit for virtually the entire time. There appears to have been some problem with the meter during this time which also resulted in some of the 30-day average leakage numbers being inaccurately low. Clough Harbour indicated in their response that the exceedance of the secondary leachate leakage rate limit in cell 11 was due to the secondary leachate in cell 10 which could not be removed due to the pump failures overflowing into cell 11. This seems likely.

While the City of Albany and Clough Harbour may have done everything reasonable to restore the proper functioning of cell 10, the fact remains that this cell did not function as required by 6 NYCRR Part 360 from July 21, 2006 through at least March 25, 2008 and considering the repeated problems with the pump, piping and metering, there is no assurance that these problems will not continue. The inability to remove leachate from the secondary leachate system of cell 10, resulting in the collection of leachate therein for months at a time likely resulted in a violation of the requirement in 6 NYCRR Part 360-2.9(j)(4) that it be ensured that the secondary leachate collection and removal system be maintained in a free-flowing condition to prevent excessive leachate head accumulation on the lower liner. It is likely that this has resulted in hydraulic connection across the entire double composite liner system, greatly increasing leachate head on the secondary composite liner and the potential for leakage.

In addition, the overflow of leachate from cell 10 into cell 11 has increased the leachate head in and the potential for leakage from that cell. The excess accumulation of leachate in both cells 10 and 11 has also made it impossible to accurately determine the actual leakage rate through the primary composite liner. Furthermore, the fact that after months of pumping the accumulated leachate from the cell 10 secondary system there was still accumulated leachate to remove (or the daily leakage rate was actually above 20 gallons/acre-day) is far from desirable. It should be possible to remove this leachate more quickly than that.

In addition to the problems with cells 10 and 11 discussed above, there have been other liner system problems identified for various cells for the period since 2003, as indicated in the attached table. 6 NYCRR Part 360-2.13(i) requires that "For lateral expansions adjacent to existing landfills, the department may approve encroachment on the existing landfill's side slope if a leachate barrier system is designed and constructed to minimize leachate migration into the existing landfill." Therefore, if an overfill liner is not to be constructed in this case, a variance application demonstrating the adequacy of the existing liner system, including the leachate collection and removal systems, must be submitted and approved.

On April 24, 2008 a meeting was held and attended by the NYSDEC, City of Albany (City) and CHA to review the action leakage rates (ALR) for the facility, specifically, cells 10 and 11 were discussed extensively.

Cell 10 & 11

Each pump failure or meter malfunction that occurred in cell 10 was reviewed and the performance of the leachate collection and leak detection systems in the cell was discussed. When a pump or meter failure occurred, the leak detection valve was closed and subsequently opened upon repair. At each repair event, an increase in the ALR was observed upon opening of the valve, immediately followed by a consistent decline in ALR as secondary leachate was drained from the cell. Succeeding the last pump failure event that was repaired on March 21, 2008, the daily ALR for cell 10 has declined to 19.3 gallons/acre/day (g/a/d) from a daily ALR of 170 g/a/d upon opening of the valve. The consistent decline in ALR over a relatively short period of time for draining a soil layer indicates that the leak detection system is operating

properly and secondary leachate is draining from the cell and no leachate head is accumulating on the secondary liner system.

As discussed at the meeting, cell 11 was impacted by closing the secondary collection valve in cell 10 which resulted in an elevated ALR in cell 11 for a period of time. However, cell 11 declined with opening of the secondary leachate valve in cell 10 and since the 30-day ALR average has remained below 20 g/a/d indicating it is operating properly and secondary leachate is draining from the cell and no leachate head is accumulating on the secondary liner system.

To reduce/eliminate the repair time of pump station failures, the City now maintains an inventory of parts and pumps. The inventory will ensure immediate repair of the stations and reduce the amount of down time metering of secondary flow. In addition, the City will be installing a Supervisory, Control and Data Acquisition (SCADA) system to automate the secondary leachate flow meter recording, status of pump station pumps and continuous monitoring to ensure malfunctions and failures are reported and repaired.

It should be noted that the pump station designs for cells 10 and 11 are planned to be modified with the construction of the proposed Eastern Expansion Project. Modifications will include relocation of the pump stations to the north, outside the limits of the Eastern Expansion cells, and modification to the piping systems to gravity flow primary and secondary leachate to Pump Station #1 which allows for easy access to the pumps and metering devices without confined space entry.

Cell 5

A discussion was had regarding the ALR for each of the remaining cells at the facility and the actions taken in the past to reduce elevated ALR occurrences. Generally, elevated ALR at the facility have been remediated by flushing the primary and secondary collection piping of the cells to ensure uninterrupted drainage of leachate through the piping systems. Due to this, the annual maintenance event, that includes flushing of the leachate collection systems, has been increased to semi-annually. The 30-day ALR for cell 5 is currently above 20 g/a/d and a flushing event was performed on May 12, 2008 to remediate the elevated ALR. In the past, flushing of cell 5 has remediated the elevated ALR level.

Subsequent to the April 24, 2008 meeting, Mr. Dave Lasher of the NYSDEC contacted CHA to discuss the ALR readings for cell 5. Mr. Lasher indicated that ALR has been above the regulatory limit since late December 2007 and has oscillated above 20 g/a/d for the past several years. As indicated above, flushing of the leachate collection lines has reduced the ALR in the past and was recently performed on May 12, 2008. The flushing event appears to have had a positive impact on the cell 5 performance as the daily ALR has declined to 11.7 g/a/d and the 30-Day ALR has declined to 18.3 g/a/d in cell 5. Based on discussions with Mr. Thomas Reynolds of the NYSDEC regarding the elevated ALR in cell 5 and the remediation efforts performed in the past, we propose to fill the expansion area over cell 5 first then construct the final closure cap over the cell 5. Fill progression has been modified to complete waste placement in the cell 5 area to the proposed final closures grades for the Eastern Expansion. The proposed Solid Waste Progression plan (Drawing G-13) and the Final Closure/Landscape/Stormwater Control Plan (Drawing G-11) are included as Attachment 7.

Variance

As indicated in the comment above, NYCRR Part 360-2.13(i) requires a leachate barrier be constructed over existing landfill side slopes for lateral expansions to minimize leachate migration into the existing landfill. The proposed Eastern Expansion project will overlay the side slopes of cells 1, 9, 10 and 11 of the Albany Interim Landfill that have been constructed in accordance with NYCRR Part 360 regulation; therefore, a leachate barrier will not be constructed over the overlay areas of the existing landfill. Leachate generation for the existing landfill with the proposed overlay will decrease or remain the same due to the additional waste placement; therefore, the leachate collection and removal systems for the existing landfill are sufficient. An application for variance from NYCRR Part 360-2.13(i) is included as Attachment 7.

10. It does not appear that the reference in 3.7.3.1.A of the CQA/QC plan was changed to ASTM D854.

The reference in Section 3.7.3.1.A has been changed to ASTM D854. The revised text on page 22 of the CQA/QC Plan is included in Attachment 3.

11. The reference to the six inch lifts of low permeability liner material being shown on the drawings does not appear to have been removed from 3.7.3.3 of the CQA/QC plan.

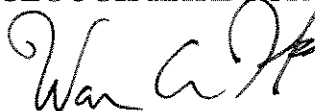
The reference to the six inch lifts of low permeability liner material being shown on the drawings has been removed from in Section 3.7.3.3. The revised text on page 23 of the CQA/QC Plan is included in Attachment 3.

This response letter, together with the attached information is hereby made part of the 6 NYCRR Part 360 Permit Application for the Rapp Road Solid Waste Management Facility Eastern Landfill Expansion.

If you have any questions or require additional clarification regarding the information included herein, please do not hesitate to contact me at 518-453-2851.

Very truly yours,

CLOUGH HARBOUR & ASSOCIATES LLP


Warren A. Harris, P.E.
Senior Associate



/dmf

Enclosures

cc: B. Bruce, City of Albany, w/enc.
J. Giebelhaus, City of Albany, w/enc.
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F. LaVardera, CHA

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CHA

Attachment 1

In both of the above cases, the 12 inch gas venting soil layer required by 6 NYCRR Part 360 has been eliminated, as active gas collection will continue to be a part of the operational and post-closure plan for the expansion, and has been approved for the facility as an equivalent design by NYSDEC, as detailed in Special Condition 27, Paragraph D of the current 6 NYCRR Part 360 Permit for the Rapp Road Solid Waste Management Facility (DEC 4-0101-00171/00011).

Deleted:

Deleted: upon issuance of the permit for the Wedge.

A cost estimate for the closure of the landfill is included in Section 13 of the permit application for the Eastern Landfill Expansion. The closure estimate has been prepared to fulfill the requirements of 6 NYCRR Part 360-2.19(b) and include the information required by 6 NYCRR Part 360-2.15(b)(5)(i) and (ii).

3.2 Post-Closure Monitoring and Maintenance

Post-closure environmental monitoring and maintenance will meet the requirements of 6 NYCRR Part 360-2.15(k).

Post-closure water quality monitoring meeting the requirements of 6 NYCRR Part 360-2.15(k)(4) is addressed in detail within the Environmental Monitoring Plan appended to the Hydrogeological Report in Section 8 of the 6 NYCRR Part 360 Application.

Landfill gases will be controlled after closure in accordance with 6 NYCRR Part 360-2.15(e) by the active gas recovery system which will continue to operate after closure. Perimeter gas collection as required by 6 NYCRR Part 360-2.15(f) will not be necessary while the recovery system is operational. Details of the gas control system are included in the Gas Collection System Report included in Section 13 of the permit application.

The landfill cover system, vegetation, drainage control structures, leachate and gas collection systems, and other site facilities will be monitored during regular inspections and maintained after closure of the landfill in accordance with 6 NYCRR Part 360-2.15(k).



Special Conditions
FOR ARTICLE 27, Title 7 (Solid Waste Management)

27. The Permittee will, in response to the existing and potential occurrence of on and off site odors relating to the inactive Greater Albany Landfill, the Interim Landfill, the Wedge and the P-4 Expansion Landfill, continue or initiate the following measures as means of controlling this problem:
- A. The Permittee will up-date the inventory of all potential sources of off-site odors resulting from the presence and/or operation of the Landfill.
 - B. Along with the identification of any "new" potential sources of off-site odors, the Permittee will submit for approval a remedial action measure for each new odor source identified with an expeditious schedule for implementation.
 - C. Until the Landfill is inactive, or the Fox Run Estates property has been dedicated to the Albany Pine Bush Preserve Commission, whichever occurs first, the Permittee must establish a schedule for quarterly community outreach program (e.g., public meeting, newsletter, etc.). Meetings, when scheduled, will be held at a location within three miles of the landfill and the residents of Fox Run Estates must be notified individually of any meeting. In addition, the Permittee must notify the landfill neighbors of upcoming activities on the landfill which have the potential of causing nuisance conditions. Such notice will be posted in the weather-proof and enclosed bulletin-board located in the area of the mailboxes. The notice must be posted at least five business days prior to the activity except for emergency activities where the notice will be posted as soon as practicable. A copy of all notices or newsletters must also be provided to the Department.
 - D. The practice of connecting all horizontal landfill gas extraction pipes to the active landfill gas collection/control system as they are being installed will continue. It is understood that it may be necessary due to concerns related to oxygen infiltration/intrusion that these connections may be "valved down" and/or closed, but they must be connected to the active system as required herein.

The equivalent design that was previously approved by the Department shall remain in effect for the P-4 Expansion. Therefore, the horizontal landfill gas collection pipes shall be placed within the Landfill waste mass and shall have used tires installed around them, with NYSDOT #3A or #3 non carbonate stone as backfill material in and around the waste tires, as described in the Engineering Report referenced in Condition No. 1. It will not be acceptable to use tire chips as a substitute ballast material for the whole tires. The Permittee may request the Department's consideration/approval of alternative designs. Use of this active landfill gas collection/control system eliminates the need for the gas venting layer in the cover system for the P-4 Expansion Landfill.

DEC PERMIT NUMBER 01-00171/00011		
FACILITY ID NUMBER	PROGRAM NUMBER #01-502-1	PAGE 8 OF 13

Attachment 2

SECTION 02206 LOW PERMEABILITY SOIL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Contractor shall provide all labor, materials, equipment, and services necessary for, and incidental to, furnishing, placing, compacting and testing the low permeability soil as shown on the Contract Drawings and as specified herein.
- B. The Contractor shall accept the site in the condition in which it exists at the time of the award of the Contract.
- C. The Engineer shall determine the suitability of materials that are to be used in the work and should any materials encountered be unsatisfactory for the purpose intended, they shall be removed from the site at the Contractor's expense.

1.2 QUALITY ASSURANCE

- A. The latest edition of the following standards and regulations, as referenced herein, shall be applicable.
 - 1. American Society for Testing and Materials (ASTM).
 - 2. Standard Specification for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO).
 - 3. 6 NYCRR Part 360 Solid Waste Management Facilities.
- B. The Contractor shall comply with the requirements for soil erosion and sedimentation control, and other requirements of governmental authorities having jurisdiction, including the State of New York.
- C. The Contractor shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of soils with the specifications.

1.3 SUBMITTALS

- A. The Contractor shall furnish representative earth materials to the testing laboratory for analysis and report, as directed by the Engineer or as outlined in the specifications.
- B. Descriptive information on compaction equipment to be used for construction with low permeability soil, including equipment proposed for use in confined areas.
- C. Plan detailing proposed borrow source, borrow source prequalification testing data, and estimated borrow source quantity.
- D. Schedule of placement.
- E. Test reports for prequalification and construction quality control/quality assurance testing shall be submitted to both the Contractor and Engineer.

1.4 PRODUCT HANDLING

- A. Soil materials shall be excavated from the borrow source, transported, conditioned, placed, and stockpiled in such a manner so as to prevent contamination, segregation, and excessive wetting. Materials that have become contaminated, excessively wet, or segregated shall not be used and shall be removed from the site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Impervious silty clay and clayey silt soils, classified as MH, CL, or CH in the Unified Soil Classification System (ASTM D 2487), with no sizes larger than ~~3 inches~~ one inch and at least 75 percent by dry weight of fines passing the No. 200 standard sieve size. The plasticity index shall be at least 15 (ASTM D 4318). The coefficient of permeability of the clay shall be less than 1×10^{-7} centimeters per second when compacted to a minimum of 90 percent of ~~standard~~ modified Proctor maximum dry density at a moisture content wet of optimum.

PART 3 - EXECUTION

3.1 BORROW SOIL MATERIAL QUALIFICATION AND QUALITY CONTROL TESTING

A. General:

1. Sufficient size samples shall be obtained from the potential borrow source to allow completion of tests listed in paragraph B (material tests) below. Samples may be obtained from test borings, test pits, or from borrow pit faces provided that surficial dry or wet soil is removed to expose undisturbed earth. Tests listed below shall be performed on each sample obtained.
 - a. A minimum of three (3) representative samples from each potential borrow source shall be furnished to the testing laboratory for prequalification testing. Test data shall be submitted to the Engineer a minimum of 2 weeks prior to start of construction for approval of the borrow source.
 - b. Additional quality control samples shall be obtained during construction at the frequencies specified in paragraph B below to verify that borrow materials meet specification requirements.

B. Material Tests:

1. Particle Size Analysis:
 - a. Method: ASTM D422
 - b. Number of Tests:
 - 1.) Prequalification: 1 test per source.
 - 2.) Quality Control: 1 per 2,500 cubic yards placed.
 - c. Acceptance Criteria: Gradation within specified limits.
2. Atterberg Limits Determinations:
 - a. Method: ASTM D4318
 - b. Number of Tests:
 - 1.) Prequalification: 1 test per source.
 - 2.) Quality Control: 1 per 1,000 cubic yards placed.
 - c. Acceptance Criteria: Plasticity index within specified limits.

3. Moisture Content:

- a. Method: ASTM D2216
- b. Number of Tests:

- 1.) Prequalification: 2 tests per source.
- 2.) Quality Control: 1 per 1,000 cubic yards placed.

Test shall be performed on sample specimen preserved at natural (undisturbed) moisture condition.

4. Maximum Density Determination:

- a. Method: ASTM D1557 - Modified Proctor
- b. Number of Tests:

- 1.) Prequalification: 1 test per source. See Paragraph 3.1 (B)(8).
- 2.) Quality Control: 1 per 5,000 cubic yards placed.

5. Permeability of Cohesive Soils:

- a. Method: ASTM D5084
- b. Number of Tests: Minimum two (2) tests per sample performed with sample compacted to 85% and 90% maximum Modified Proctor dry density at optimum moisture content.
 - 1.) Prequalification: ~~1 test per source. The intent is to demonstrate that the coefficient of permeability will be less than 1×10^{-7} cm/sec for specified density and moisture content requirements~~ See Paragraph 3.1 (B)(9).
 - 2.) Quality Control: 1 sample per 5,000 cubic yards placed. Tests shall be performed using same criteria as for prequalification testing.
- c. Acceptance Criteria: Coefficient of permeability less than 1×10^{-7} centimeters per second.

6. Internal angle of soil friction and cohesion:

- a. Method: ASTM 3080 - Direct shear test.
- b. Number of Tests: One (1) prequalification test series per source. Test series shall consist of three (3) identical specimens from each sample subjected to direct shear test using normal (vertical) stresses of approximately 1 pound per square inch (psi), 2 psi and 4 psi. Test specimens shall be compacted to 90% of maximum modified Proctor dry density at a moisture content 2 percent wet of optimum.

7. Interface Friction Angle:

- a. Method: ASTM D5321 – Test Method for Determining the Coefficient of the Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Sear Method.

- b. Number of Tests: One (1) prequalification test series per potential borrow source. Test series shall consist of three (3) identical specimens from one of the three borrow source samples subjected to shear test using normal (vertical) stresses of approximately 1 psi, 1-2 psi, and 4 psi. Test specimens shall be compacted to 90% of maximum modified Proctor dry density at a moisture content 2 percent wet of optimum.
- c. Acceptance Criteria: Friction angle greater than or equal to 29°.
- d. Geosynthetic to be used for interface:
 - 1.) Proposed geomembrane meeting specifications described in Section 02212.

- 8. Moisture-Density Relationship: A moisture-density relationship shall be determined by using the modified Proctor Method (ASTM D1557) modified as follows: Three proctors shall be performed, each at a different compactive effort. The three compactive efforts shall be 12,26, and 56 blows per layer as compacted in 5 layers in a standard 6 inch diameter mold. A compaction curve shall be developed for each of the three compactive efforts. For each compaction curve, a minimum of five specimens shall be prepared, specifically at the following moisture contents: 2% below optimum moisture content (OMC), OMC, 2%, 4%, and 6% above OMC.
- 9. Permeability Relationship (ASTM D5084):- Each one of the compacted moisture-density test specimens from the three proctor curves listed above shall be sampled and tested to determine its hydraulic conductivity (ASTM D5084).

3.2 PLACEMENT AND COMPACTION

A. General:

- 1. The ground on which the low permeability soil is to be placed shall be proof rolled until the underlying soil is thoroughly compacted to the satisfaction of the Engineer before any filling is begun. A steel-wheel tandem roller weighing 8 to 10 tons or equipment capable of obtaining the same compactive effort shall be used to obtain a thoroughly compacted subgrade. Remove or recompact any soft or loose soils as determined by the Engineer prior to filling. Particular emphasis shall be placed on obtaining a firm, compacted surface.
- 2. Do not place fill material on surfaces that are muddy, frozen, or contain frost, ice, ponded water or extraneous debris.
- 3. When work is suspended during periods of freezing weather, measures shall be taken to prevent fill already in place from freezing. Upon resumption of work after any inclement weather, prepare the exposed surface by proof rolling to identify any zones of soft/loose soils. Soft/loose materials or frozen soils shall be removed and replaced.
- 4. The distribution of materials throughout the low permeability soil shall be such that the layer will be free from lenses, pockets, streaks, and layers of materials differing substantially from the surrounding materials.
- 5. The placing of material shall be done so as to obtain a layer of uniform thickness without spaces between successively deposited loads.
- 6. Compaction of each layer shall proceed in a systematic, orderly, and continuous manner so as to ensure the specified coverages by the compaction equipment.

7. Materials which cannot be compacted by the approved rolling compaction equipment because of interferences shall be compacted with smaller approved compactors to a density at least equal to the density achieved in adjacent areas by the rolling compaction equipment and methods. Single pad vibratory base plate compactors shall weigh not less than 200 lbs. and have a vibration frequency not less than 1600 cycles per minute.
8. Should the fill surface become rutted or uneven subsequent to compaction, it shall be releveled and recompacted before placing the next layer of material.

B. Low Permeability Soil Placement and Compaction:

1. Place fill materials in layers not more than 6" in loose depth. Lift height shall be governed by the ability of the compaction equipment to obtain the required compaction with 6" as a maximum lift height.
2. Moisture content of the material during compaction shall be between 0 and 4 percent wet of optimum moisture content as determined by ASTM D 1557 (Modified Proctor). The average moisture content of the as placed fill shall be 1 to 3 percent wet of optimum.
3. All fill shall be thoroughly and satisfactorily compacted to at least 90 percent of the modified Proctor maximum dry density of the material used (ASTM D-1557).
4. Where fill must be moisture conditioned before compaction, uniformly apply water to the surface of each layer of fill. Prevent ponding or other free water on the surface subsequent to, or during, compaction operations. Any surface exhibiting cracking from excessive drying shall be moisture conditioned and reworked by scarifying, discing, pulverizing, and recompacting prior to placement of successive lifts of earth fill or geosynthetic materials.
5. Remove and replace, or scarify and air dry, soil that is too wet to permit compaction to the specified density. Soil that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing, until moisture content is reduced to a value which will permit compaction to the percentage of maximum density specified.
6. Rolling compaction equipment shall be heavy rubber tired rollers or pad-foot type rollers capable of achieving the intended result. Compaction equipment used for the Work is subject to approval by the Engineer. Any equipment not originally manufactured for compaction purposes and equipment which is not in proper working order will not be approved. Furnish manufacturer's specifications covering data not obvious from a visual inspection of the equipment and necessary to determine its classification and performance characteristics.
7. Compaction equipment shall make a minimum of 4 complete passes over the entire area of each lift.
8. The surface of each compacted layer shall be scarified to a minimum depth of 1 inch before placing the next layer. If the fill surface softens as a result of heavy rains, the surface shall be scarified and allowed to dry until the moisture content is within the range specified herein or the wet material shall be removed. Should the surface become so dry that bond between such surface and the next layer of material will not be adequate, the Contractor shall loosen the embankment surface by discing and shall add moisture and further condition and recompact the exposed surface immediately prior to placement of the next layer.
9. The Contractor shall grade partially completed fill areas for drainage and thoroughly compact and smooth the surface at the end of each workday.

10. For areas not accessible to heavy rolling compaction equipment, fill materials shall be placed in horizontal layers not to exceed 6 inches in loose thickness and compacted with smaller rolling compaction equipment or hand operated equipment, as approved by the Engineer.
11. The final surface of the low permeability soil shall be uniform and suitable for placement of the next subsequent layer.

3.3 FIELD QUALITY ASSURANCE

- A. The Contractor's Testing Laboratory shall perform testing of low permeability soil to insure compliance with these Specifications.
- B. In-place density and moisture content tests shall be performed on in- place fill material in accordance with ASTM D 1556, D 2167 or D 2922. In-place density shall be determined at a depth of 3 inches below grade. At least 9 tests shall be performed per acre per lift of material placed and at least one test shall be performed each day. Field test locations shall be subject to approval or relocation by the Engineer.
- C. Laboratory permeability tests shall be performed on thin wall "Shelby" tube samples of the in-place soil at a frequency of 1 per acre per lift. Shelby tubes shall be advanced by jacking in one continuous smooth thrust into the compacted soil. Use of hammers or similar driving equipment will not be permitted. Use of a backhoe bucket or bulldozer blade to push sampling tubes will not be permitted. Earth moving equipment may be used as a reaction for jacks. Field methods and test locations subject to approval by the Engineer. Void resulting from sample removal shall be backfilled with low permeability soil according to placement specifications. Samples shall only be obtained of the ~~upper lift~~ most recently constructed lift; and each sample shall penetrate only the most recently constructed lift.
- D. Tests for moisture content (by ASTM D 3017) shall be performed on the in-place fill at a rate of nine tests per acre per lift. If nuclear methods or microwave methods are used to determine field moisture content, one oven-dry moisture content determination (ASTM D2216) shall be performed per acre per lift for calibration. Sample shall be obtained from a location immediately adjacent to an in-place density test location.
- E. The moisture/density envelope developed from the moisture, density, and permeability testing completed in accordance with paragraphs 3.1 (B)(8) and (9) of this Section shall be used as a guide during placement and compaction of the low permeability soil. Acceptance criteria for the in-place material is given in paragraph 3.3(G) of this Section.
- ~~E.F.~~ The Engineer may direct additional tests to establish gradation, Atterberg limits, permeability, maximum density, in-place density, and water content as required by working conditions, or changes in borrow source material at the Contractor's expense.
- ~~E.G.~~ Acceptance Criteria:
 1. Acceptance Criteria: The criteria for acceptability of in-place fill shall be in situ dry density and moisture content and in-situ permeability. Minimum dry density for all fill shall be 90 percent of the modified Proctor maximum dry density. The in-place moisture content shall be 0 to 4 percent wet of optimum as determined by the modified Proctor compaction method (ASTM D-1557). In place permeability shall be less than 1×10^{-7} cm/sec. If a test fails to qualify, the fill shall be further reworked, compacted and re-tested. Subsequent test failures shall be followed by removal and replacement of the material.

3.4 CLEAN UP

- A. Provide and maintain protection of newly filled areas against damage. Upon completion or when directed, correct all damaged and deficient work by building up low spots and remove temporary protections, fencing, shoring and bracing if any.
- B. Remove all surplus excavated material not required for filling and backfilling and legally dispose of same away from premises.
- C. Leave the premises and work in clean, satisfactory condition, ready to receive subsequent operations.

END OF SECTION 02206

Attachment 3

The preconstruction meeting will address the following topics, as a minimum:

1. Provide each involved entity with all of the relevant CQA/CQC documents and supporting information.
2. Address the site specific QA/QC plan, including the information submitted by the Contractor, and its role relative to the design criteria, plans and specifications.
3. Review the responsibilities, authorities and lines of communication for each of the involved entities.
4. Review the established procedure for observation and testing, including the sampling strategies specified in the QA/QC plan.
5. Review the established acceptance and rejection criteria as specified in the QA/QC plan and project specifications, along with the methods and means for decision making and/or resolution of problems over data.
6. How conflicts between the Engineer and Contractor will be resolved.
7. Review the methods for documenting and reporting all inspection data.
8. Discuss procedures for the storage and protection of landfill construction materials on site.
9. Conduct a site walk-through to review the project site layout, and construction material and equipment storage locations.

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The meeting minutes will become a part of the contract file. There may also be occasions when subsequent conferences will be called to reconfirm mutual understanding.

2.2 Conflict Resolution

- A. To avoid control conflicts during construction between the Engineer and the Contractor, the Engineer and/or the Engineer’s Observation Staff will communicate directly with the Contractor’s QC Manager. The Engineer and/or the Engineer’s Observation Staff will not direct the Contractor’s personnel.

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3.0 RESPONSIBILITIES AND QUALIFICATIONS OF QA/QC OFFICERS AND STAFF

3.1 Engineer's Role

A. Project Engineer: A New York State licensed professional engineer will be designated as the Project Engineer. This person will be responsible for oversight and review of observations and tests that will be used before, during, and upon completion of construction to ensure that the construction materials will meet the design criteria and specifications as required. This person will review and sign the permit and construction documents and drawings, as well as the construction certification report. The Project Engineer and his Construction Observation Staff will act independently, and without influence from the Contractors, or the City of Albany.

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B. Engineer's Project Representation: The Engineer will maintain a full time construction observation staff at the project site. Each individual will meet the minimum requirements of construction observation staff as outlined in Section 3.2C. The staff will be headed by a Chief Construction Observer, who will coordinate the staff, interface with the Contractor's QC manager, and traffic information to and from the project Engineer. The number of staff on-site will vary, depending upon the Contractor's workload. The Chief Construction Observer will be on-site for the entire project. The Chief Construction Observer and staff will be qualified by experience and technical training to perform their assigned duties.

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C. The Project Engineer will conduct regular site visits during the construction phase, and will also attend the coordination meeting as well as weekly progress meetings.

D. Chain of Command

1. Project Engineer: The Project Engineer will reside at the top of the chain of command. The Project Engineer will directly supervise both the design and construction observation engineering teams. This person will also interface directly with the facility

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owner, and the contractor when necessary. The Project Engineer will also be responsible for the final decision making with regard to construction change orders, and the interpretation or clarification of the project drawings and documents.

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2. Chief Construction Observer: The Chief Construction Observer will supervise the Engineer's field staff, and interface directly with the contractor's field supervision on a daily basis. This person will also traffic questions and interpretations to the Project Engineer for decision making.

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3. Construction Observation Staff: This staff will observe and provide QA oversight to the Contractor's QC personnel. This staff will report directly to the Chief Construction Observer.

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The Project Engineer or a representative of the Engineer's staff will be on-site when the Contractor is on site regardless of what work is being performed.

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3.2 Personnel Qualifications

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A. Project Engineer: The project engineer will be a professional engineer (PE), licensed in New York State, and will have a minimum of five (5) years of experience in landfill design, construction, operation and closure. Additionally, the project engineer will have supervised at least five (5) successfully completed landfill construction and/or closure projects.

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B. Chief Construction Observer: The chief construction observer will have at least two (2) years of field construction experience on new landfill construction, expansions or closures.

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C. Construction Observation Staff: The construction observation staff will be qualified by experience and technical training to perform construction observation of specific

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components of landfill construction. This individual(s) will be a degreed engineer(s) or at a minimum have at least two years of related construction inspection experience.

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3.3 Contractor's Quality Control Manager

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The QC Manager will be responsible for overall management of the CQC and have the authority to act in all CQC matters for the Contractor. This person will demonstrate the ability to perform correctly the duties required to the satisfaction of the Engineer. This person, or a designated representative, shall be physically present at the project site whenever work is in progress, and will be in charge of the Contractor's Quality Control Program for this project. Submittals will be reviewed and modified, as needed, by the QC Manager, prior to forwarding to the Engineer.

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3.4 Contractor's Personnel

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A staff will be maintained by the Contractor, under the direction of the QC Manager, to perform all CQC activities. The actual strength of the staff during any specific work period may vary to cover work phase needs, shifts, and rates of placement. The personnel of this staff shall be fully qualified by experience and technical training to perform their assigned responsibilities, as follows. The Contractor's QC Manger shall have at a minimum at least five (5) years of field construction experience. Two of the five years of experience shall include new landfill construction, expansion or closure projects.

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3.5 Contractor's Testing Laboratory

A. The Contractor will employ an independent testing laboratory to perform testing of construction materials prior to their installation, and during installation, as required to meet the provisions of this plan.

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B. The testing laboratory will meet the standards as set forth in ASTM D3740 - Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction.

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B. Initial Inspection - This will be performed as soon as a representative portion of the particular feature of work has been accomplished, and will include examination of the quality of workmanship, a review of quality control testing for compliance with contract requirements, a check for the use of defective or damaged materials, omissions or errors, and dimensional requirements. Such inspection will be made a matter of record in the CQC documentation as required below.

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C. Follow-Up Inspections - These will be performed daily to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. Such inspections shall be made a matter of record in the CQC documentation as required below. Final follow-up inspections will be conducted, and test deficiencies corrected prior to the addition of new features of work.

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3.7.1.2 Tests (Other than Chemical Sampling and Analysis)

A. Test Procedure - The Contractor will perform the tests and obtain samples as specified or required in order to verify that control measures are adequate, and to provide a product that conforms to contract requirements. Test performed and samples obtained in the field by the Contractor or the Contractor's testing laboratory will be observed by the Engineer or Engineer's Observation Staff. In generally, these observations by the Engineer or Engineer's Observation Staff will be unannounced. The Engineer or Engineer's Observation Staff will observe a portion of tests and sampling required to verify that the proper testing and sampling procedures are being followed. Geomembrane liner inspections will require full time observation by the Engineer or Engineer's Observation Staff. The Contractor will procure the services of an industry recognized testing laboratory, or an approved testing laboratory may be established at the project site. This laboratory will be approved by the Engineer. A list and schedule of tests (other than chemical sampling and

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determine the specific gravity (ASTM D854) of the soil in order to prepare a zero air voids curve.

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B. Permeability Relationship (ASTM D5084). Each one of the compacted moisture-density test specimens from the three proctor curves listed above will be sampled and tested to determine its hydraulic conductivity (ASTM D5084).

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3.7.3.2 Quality Control Testing During Construction

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Material Evaluation will be performed on all low permeability liner material brought to the site to determine its conformance with approved material. The following tests shall be performed on the material as it is brought from the borrow source, at the following frequencies, and the test results will be submitted to the Project Engineer for evaluation and approval.:

<u>Test</u>	<u>Standard</u>	<u>Frequency</u>
Particle Size & Hydrometer	ASTM D422	1 for Each 2,500 CY
Atterberg Limits Determination	ASTM D4318	1 for Each 1,000 CY
Moisture Content	ASTM D2216	1 for Each 1,000 CY
Modified Proctor Compaction Test	ASTM D1557	1 for Each 5,000 CY
<u>Lab Permeability Using Flexible Wall Triaxial Cell with Back Pressure</u>	<u>ASTM D854</u>	<u>1 for Each 5,000 CY</u>
<u>Moisture-Density-Permeability Relationship Method</u>	<u>ASTM D1557</u> <u>ASTM D5084</u> <u>ASTM D854</u>	1 for Each 5,000 CY

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* A graphic representation of the moisture content/density/hydraulic conductivity relationship will be constructed using all of the qualification testing data. This graphic will be continuously updated as testing data is received. From this graphic, a window (or envelope) of acceptable moisture and density values will be determined. The window of acceptable values will be used to guide soil placement conditions, and ultimately determine the pass/fail parameters for in-place moisture/density testing.

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3.7.3.3 Quality Assurance Testing During Construction

Low permeability liner materials will be placed in 6 inch lifts and compacted to at least 90% modified Proctor maximum dry density, and a maximum permeability of 1×10^{-7} cm/sec. The following tests will be performed in order to evaluate the installed material and the test results will be submitted to the Project Engineer for evaluation and approval:

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Test	Standard	Frequency
In Place Soil Density By Sand Cone Method and/or by Nuclear Methods	ASTM D1556 ASTMD 2922 ASTM D2167	9/acre/lift
<u>Moisture-Density-Permeability Relationship Method</u>	<u>ASTM D1557</u> <u>ASTM D5084</u> <u>ASTM D854</u>	<u>1 for Each 5,000 CY</u>
In Place Soil Moisture Content	ASTM D2216	1/acre/lift
Moisture Content by Nuclear Methods	ASTM D3017	9/acre/lift

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3.7.3.4 Corrective Actions

Material for which testing reveals to be inconsistent with the specifications or with the pre-tested source borrow material will be removed from the site, and replaced with conforming material. Material for which tests reveal insufficient compaction will be re-compacted and tested in accordance with the above schedule.

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3.7.4 Geomembrane

3.7.4.1 Quality Control Testing During Manufacture

A. The Contractor will provide the textured synthetic geomembrane manufacturer's certification showing that, as a minimum, the tests listed below were conducted by the geomembrane manufacturer. These test results will be submitted to the Project Engineer for evaluation and approval.

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2. As the work progresses in the field, the Chief Construction Observer will mark all locations requiring repair work and verify all repairs have been successfully made by the Installer.

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3. A field seam will only be considered acceptable when bounded by two destructive test locations which have passed laboratory testing and acceptable non-destructive testing. The following procedures will apply in the event that a seam fails laboratory testing.

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- a. The Installer may reconstruct the seam between the previous passing test location and the next passing test location and retest, or
- b. The Installer may elect to trace the extent of an unacceptable seam to some intermediate location. This shall involve taking 1 inch template-cut cross-sections from these seams at a minimum distance of 10 feet in both directions from the failed test location.

1. These samples shall be tested in the field tensiometer in both shear and peel in accordance with Section 3.7.4.2.B.

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2. If one or both of these samples fail, the field test tracing along the seam shall continue at a minimum 10 foot increments until a passing result is recorded in both directions from the failed test location. At these locations large samples shall be cut for laboratory testing as in Section 3.7.4.2.E.

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3. If laboratory testing shows the seam to be unacceptable, the Installer shall further trace the unacceptable seam until acceptable test results are recorded in both directions.

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performed on the borrow source prior to construction, and whenever soil material changes are noted. The test results will be submitted to the Project Engineer for evaluation and approval.

<u>Test</u>	<u>Standard</u>	<u>Number</u>
Particle Size Analysis	ASTM D422	1 per potential borrow source
Atterberg Limits Determination	ASTM D4318	1 per potential borrow source
Moisture Content	ASTM D2216	1 per potential borrow source
Maximum Density Determination	ASTM D1557	1 per potential borrow source
Permeability of Granular Soils	ASTM D2434	4.0 per potential borrow source
Internal Angle of Soil Friction and Cohesion	ASTM D3080	1 test series per potential borrow source
Interface Friction Angle for each Synthetic Material	ASTM D5321	1 test series per potential borrow source

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3.7.5.2 Quality Control Testing During Construction

Material Evaluation will be performed on all leachate collection soil brought to the site to determine its conformance with approved material. The following tests shall be performed on the material at the landfill site after it is brought from the borrow source and transported to the site, at the frequencies listed below. The test results will be submitted to the Project Engineer for evaluation and approval.

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<u>Test</u>	<u>Standard</u>	<u>Number</u>
Particle Size Analysis	ASTM D422	1 for Each 1,000 CY
Permeability of Granular Soils	ASTM D2434	1 for Each 2,500 CY

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3.7.5.3 Quality Assurance Testing During Construction

Leachate collection soil will be placed in 12 to 24 inch lifts as shown on drawings, and compacted to at least 90% modified Proctor maximum dry density, and a minimum permeability of 1×10^{-2} cm/sec. The tests listed below will be performed in order to evaluate the installed material. The test results will be submitted to the Project Engineer for evaluation and approval.

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Attachment 4



CLOUGH HARBOUR & ASSOCIATES LLP

CONSTRUCTION OBSERVATION REPORT

PROJECT _____

LOCATION _____

REPORT NO.

PAGE NO. OF

DATE:

WEATHER

TEMPERATURE

HIGH

LOW

PROJECT #

SPECIFY: LOCATION, NATURE OF WORK BY CONTRACTOR & SUB-CONTRACTOR FOR EACH OPERATION
DESCRIPTION OF WORK PERFORMED AND OBSERVED

THE ABOVE DESCRIBED WORK WAS INCORPORATED INTO THE PROJECT & WAS OBSERVED BY:

OBSERVER'S SIGNATURE

TIME CHARGED TO PROJECT: _____

MILEAGE CHARGED TO PROJECT: _____

ADDITIONAL SHEETS USED **CHECK INITIALS** _____

Attachment 5

Warren, Kyle

From: Cowan, Keith
Sent: Monday, April 28, 2008 6:02 PM
To: Foley, David
Subject: FW: Picture of SWL Meter w/ tape incorrect

Attachments: text.txt; 012308_10291.jpg



text.txt



012308_10291.jpg

Keith Cowan, C.P.G.
Associate
Clough Harbour & Associates, LLP
Email: kcowan@cha-llp.com
www.cloughharbour.com
P Please consider the environment before printing this email

-----Original Message-----
From: Matt Broker [<mailto:MBroker@upstatelabs.com>]
Sent: Wednesday, April 16, 2008 12:42 PM
To: Cowan, Keith
Subject: Fw: Picture of SWL Meter w/ tape incorrect

Keith,
This is the original message I sent to the company. It has a picture showing the incorrect tape. I am also going to send you the follow up email.
Matt Broker

----- Original Message -----
From: "Matt Broker" <MBroker@upstatelabs.com>
To: <susan.loit@solinst.com>
Sent: Wednesday, January 23, 2008 11:54 AM
Subject: Picture of SWL Meter w/ tape incorrect

> Hi Susan,
> I am sending you this email regarding SWL Meter Serial #43957. The 1 ft
> mark is actually at the 3ft mark. In the picture the pencil is where the
> 1
> ft mark is. The 2 red pens represent the other ft marks, where there is
> actually no number. Please let me know what can be done with this. I do
> need it for Monday morning. I gave Rick from our Syracuse office your
> number. I beleive he wanted to call nd speak to you.

> Thank you,
> Matt Broker
> ----- Original Message -----
> From: <5184692218@vzwpix.com>
> To: <Mbroker@upstatelabs.com>
> Sent: Wednesday, January 23, 2008 10:30 AM
>
>
> > Water level
> >
> > This message was sent using PIX-FLIX Messaging service from Verizon
> Wireless!
> > To learn how you can snap pictures with your wireless phone visit
> > www.verizonwireless.com/getitnow/getpix.

> >
> > To learn how you can record videos with your wireless phone visit
> www.verizonwireless.com/getitnow/getflix.
> >
> > To play video messages sent to email, QuickTime® 6.5 or higher is
> required. Visit www.apple.com/quicktime/download to download the free
player
> or upgrade your existing QuickTime® Player. Note: During the download
> > process when asked to choose an installation type (Minimum, Recommended
or
> Custom), select Minimum for faster download.
> >
> >
>

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I am using the free version of SPAMfighter for private users.
It has removed 1597 spam emails to date.
Paying users do not have this message in their emails.
Get the free SPAMfighter here: <http://www.spamfighter.com/len>



Warren, Kyle

From: Cowan, Keith
Sent: Monday, April 28, 2008 6:01 PM
To: Foley, David
Subject: FW: Picture of SWL Meter w/ tape incorrect
Attachments: 101p2.pdf; 101P2S.pdf

Keith Cowan, C.P.G.
 Associate
 Clough Harbour & Associates, LLP
 Email: kcowan@cha-llp.com
www.cloughharbour.com



From: Matt Broker [mailto:MBroker@upstatelabs.com]
Sent: Wednesday, April 16, 2008 12:44 PM
To: Cowan, Keith
Subject: Fw: Picture of SWL Meter w/ tape incorrect

Keith,
 Here is the response I recieved from them. I ended up doing it myself if you need to know. Let me know if you have any more problems.

Matt Broker

----- Original Message -----

From: [Susan Loit](mailto:SusanLoit@solinst.com)
To: [Matt Broker](mailto:MattBroker@upstatelabs.com)
Sent: Wednesday, January 23, 2008 5:10 PM
Subject: Re: Picture of SWL Meter w/ tape incorrect

Hi Matt,

Sorry about the delay. ?I had alot of telephone calls this afternoon. ? Based on your description, it sounds like the tape was not cut back enough. ? We have two options for the you:

1.? Send back WLM to Solinst for no charge warranty repair, we would cut back tape and re-attach probe at the correct mark.? We would pay freight charges both ways (UPS-Express return to Solinst, UPS-ground return to client). ?Might not receive back by Monday.

2.? We can send no charge Probe Seal Kit and instructions to attach probe to tape.? If you are comfortable doing the repair himself, you would have working unit by Monday. ?

Let me know which option you prefer. ?Please feel free to contact me by email (susan.loit@solinst.com) or by phone (1 800 661 2023) if you have any questions.

Best regards,

Susan Loit
 Technical Sales/Service Representative
 Solinst Canada Ltd.
 35 Todd Road, Georgetown
 ON L7G 4R8 CANADA

6/30/2008

Tel: +1 (905) 873-2255 or +1 (800) 661-2023
Fax: +1(905) 873-1992 or +1 (800) 516-9081
Web:??<http://www.solinst.com>

On 23-Jan-08, at 10:54 AM, Matt Broker wrote:

Hi Susan,
I am sending you this email regarding SWL Meter Serial #43957.? The 1 ft mark is actually at the 3ft mark.? In the picture the pencil is where the 1 ft mark is.? The 2 red pens represent the other ft marks, where there is actually no number.? Please let me know what can be done with this.? I do need it for Monday morning.? I gave Rick from our Syracuse office your number.? I beleive he wanted to call nd speak to you.

Thank you,
Matt Broker

----- Original Message -----?

From: <5184692218@vzwpix.com>

To: <Mbroker@upstatelabs.com>

Sent: Wednesday, January 23, 2008 10:30 AM

Water level

This message was sent using PIX-FLIX Messaging service from Verizon Wireless!

To learn how you can snap pictures with your wireless phone visit www.verizonwireless.com/getitnow/getpix.

To learn how you can record videos with your wireless phone visit www.verizonwireless.com/getitnow/getflix.

To play video messages sent to email, QuickTime? 6.5 or higher is required. Visit www.apple.com/quicktime/download to download the free player or upgrade your existing QuickTime? Player.? Note: During the download

process when asked to choose an installation type (Minimum, Recommended or Custom), select Minimum for faster download.

--?

6/30/2008

I am using the free version of SPAMfighter for private users.

It has removed 1002 spam emails to date.

Paying users do not have this message in their emails.

Get the free SPAMfighter here: <http://www.spamfighter.com/len><text.txt><012308_10291.jpg>

Hi Matt,

Sorry about the delay. I had alot of telephone calls this afternoon. Based on your description, it sounds like the tape was not cut back enough. We have two options for the you:

1. Send back WLM to Solinst for no charge warranty repair, we would cut back tape and re-attach probe at the correct mark. We would pay freight charges both ways (UPS-Express return to Solinst, UPS-ground return to client). Might not receive back by Monday.
2. We can send no charge Probe Seal Kit and instructions to attach probe to tape. If you are comfortable doing the repair himself, you would have working unit by Monday.

Let me know which option you prefer. Please feel free to contact me by email (susan.loit@solinst.com) or by phone (1 800 661 2023) if you have any questions.

Best regards,

Susan Loit
Technical Sales/Service Representative
Solinst Canada Ltd.
35 Todd Road, Georgetown
ON L7G 4R8 CANADA

Tel: +1 (905) 873-2255 or +1 (800) 661-2023

Fax: +1(905) 873-1992 or +1 (800) 516-9081

Web: <http://www.solinst.com>

[OBJ]

[OBJ]

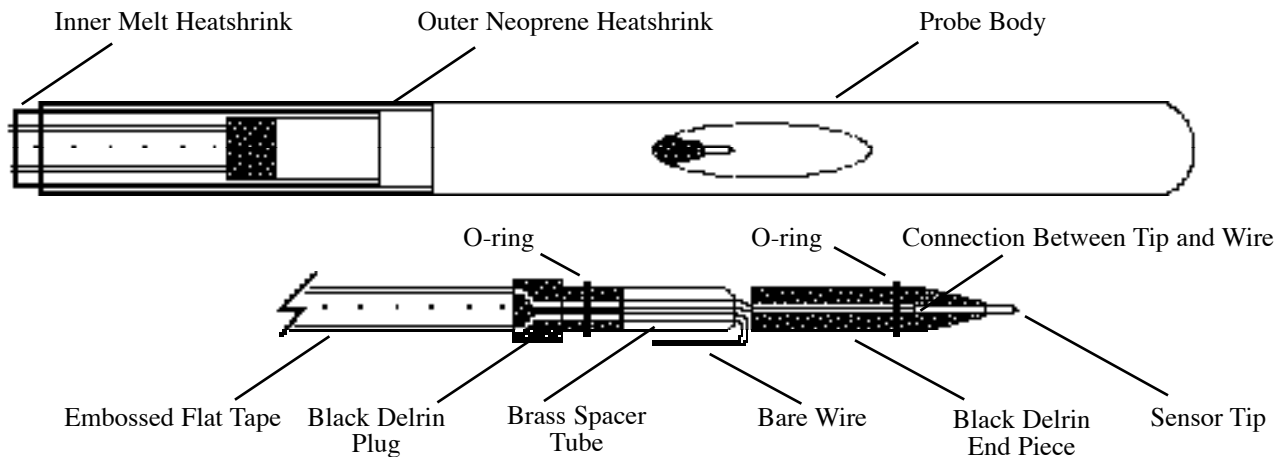
On 23-Jan-08, at 10:54 AM, Matt Broker wrote:

- > Hi Susan,
- > I am sending you this email regarding SWL Meter Serial #43957. The
- > 1 ft
- > mark is actually at the 3ft mark. In the picture the pencil is
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- > ft mark is. The 2 red pens represent the other ft marks, where

6/30/2008

> there is
> actually no number. Please let me know what can be done with
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> ----- Original Message -----
> From: <5184692218@vzwpix.com>
> To: <Mbroker@upstatelabs.com>
> Sent: Wednesday, January 23, 2008 10:30 AM
>
>
>> Water level
>>
>> This message was sent using PIX-FLIX Messaging service from Verizon
> Wireless!
>> To learn how you can snap pictures with your wireless phone visit
>> www.verizonwireless.com/getitnow/getpix.
>>
>> To learn how you can record videos with your wireless phone visit
> www.verizonwireless.com/getitnow/getflix.
>>
>> To play video messages sent to email, QuickTime® 6.5 or higher is
> required. Visit www.apple.com/quicktime/download to download the
> free player
> or upgrade your existing QuickTime® Player. Note: During the
> download
>> process when asked to choose an installation type (Minimum,
>> Recommended or
> Custom), select Minimum for faster download.
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> --
> I am using the free version of SPAMfighter for private users.
> It has removed 1002 spam emails to date.
> Paying users do not have this message in their emails.
> Get the free SPAMfighter here: <http://www.spamfighter.com/>
> len<text.txt><012308_10291.jpg>

I am using the free version of SPAMfighter for private users.
It has removed 1597 spam emails to date.
Paying users do not have this message in their emails.
Try [SPAMfighter](#) for free now!

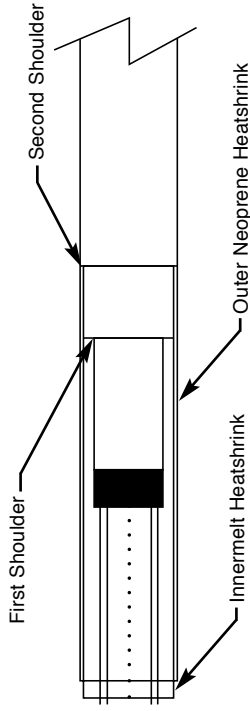


Component List

Embossed Flat Tape
Inner Melt Heatshrink
Outer Neoprene Heatshrink
Teflon Plug with two holes and o-ring
Brass Spacer Tube
Stainless Steel Sensor Tip
Stainless Steel Probe Body
Teflon end piece with o-ring

Instructions

1. Cut along the lead wires from point zero to 3-1/4". Cut in a triangle formation pointing to the 3-3/4" mark.
2. Thread the two wires from the flat tape through the Teflon® plug.
3. Thread both wires into the brass spacer tube.
4. Cut one wire 1/2" longer than the brass spacer tube, as shown in the diagram. Strip that wire from the end of the brass spacer tube. Bend the stripped wire over the brass spacer tube.
5. Measure the other wire to extend just past the o-ring on the Teflon® end piece and cut. Strip approximately 1/4" of this wire, and twist the wire loose. Twist the Teflon end piece onto this wire, down to the brass spacer tube.
6. Insert the wedge end of the sensor tip into the tapered end of the Teflon end piece. Measure from the 0.5' (6" or 15.2cm) mark on the tape to point zero, as indicated in the diagram. The sensor tip should end at the zero mark. If the sensor tip is too long, push it up the Teflon end piece until it ends at the zero point. This will ensure correct measurements.
7. As you push the inner components into the probe body twist the probe gently to fit over the o-rings (some vaseline on the o-rings helps ease the probe on).
8. Slip the inner melt heat shrink over the probe onto the flat tape with your fingers. Be careful not to melt the flat tape with the heat gun.
9. Slip the outer neoprene heat shrink over the inner melt heatshrink against the second shoulder on the probe body. Apply heat starting from the centre working outward. Press the heatshrink onto the tape with your fingers.



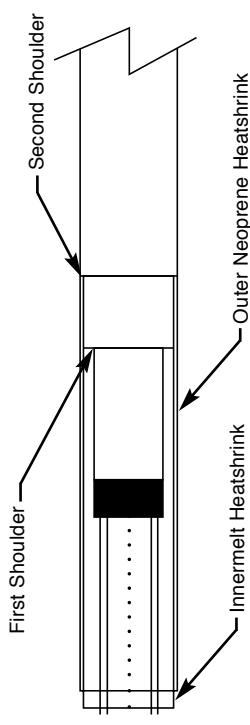
Material

- One 5" piece of innermelt heatshrink
- One 5" piece of Neoprene heatshrink

Note: The innermelt heatshrink will make a clicking noise when the end is pinched together and is slightly darker in colour.

Instructions

1. Slide the innermelt heatshrink over the probe, lining up the end of the heatshrink with the first shoulder on the probe body (see diagram)
2. Use a heat gun and apply heat starting in the centre of the heatshrink working outward to prevent air pockets from forming. Heat until only a slight amount of glue shows from the ends. Be careful not to melt the flat tape.
3. Gently press the heatshrink onto the tape with your fingers. Let cool.
4. Slide the outer neoprene heatshrink over the probe, lining up the end of the heatshrink with the second shoulder on the probe body.
5. Apply heat starting in the centre of the neoprene heatshrink working outward.
6. Gently press the heatshrink onto the tape with your fingers.



Material

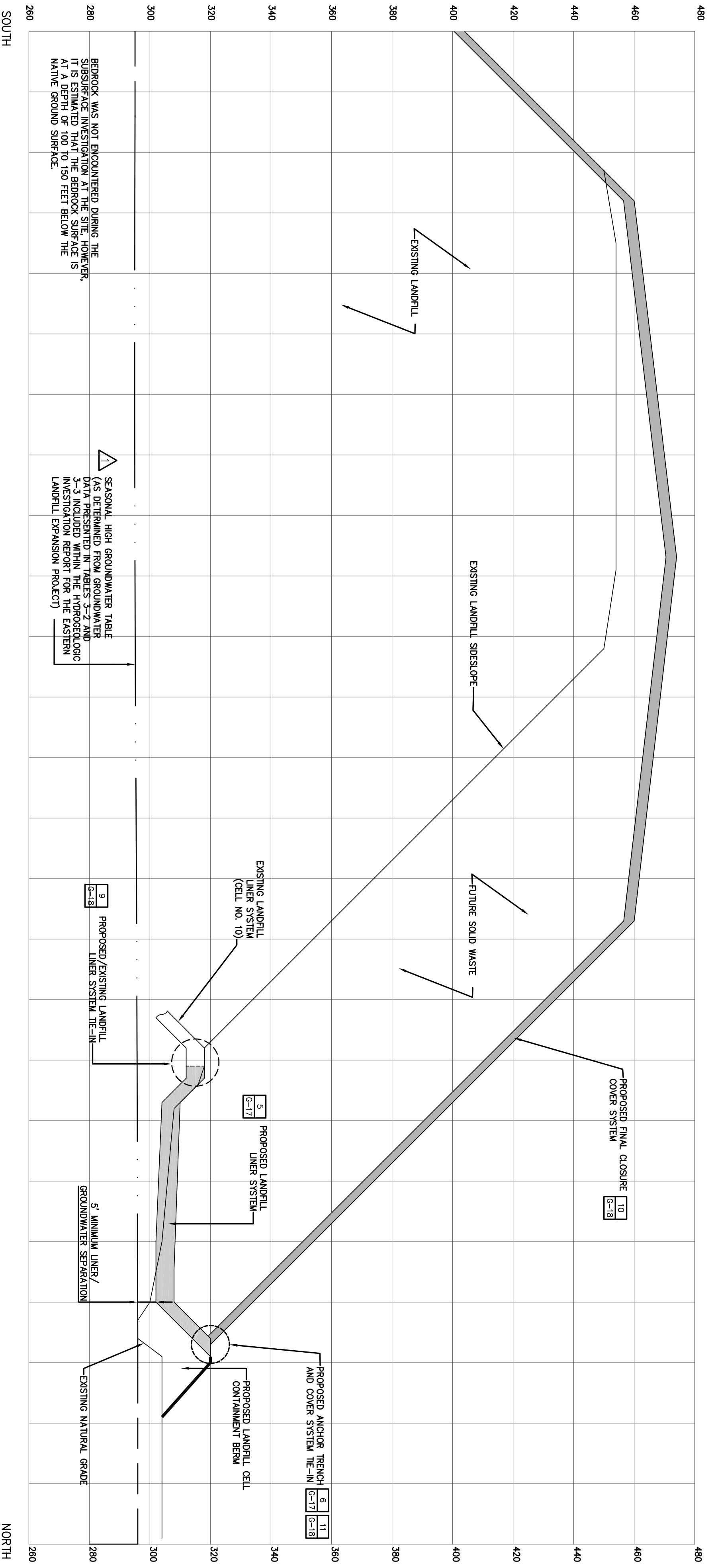
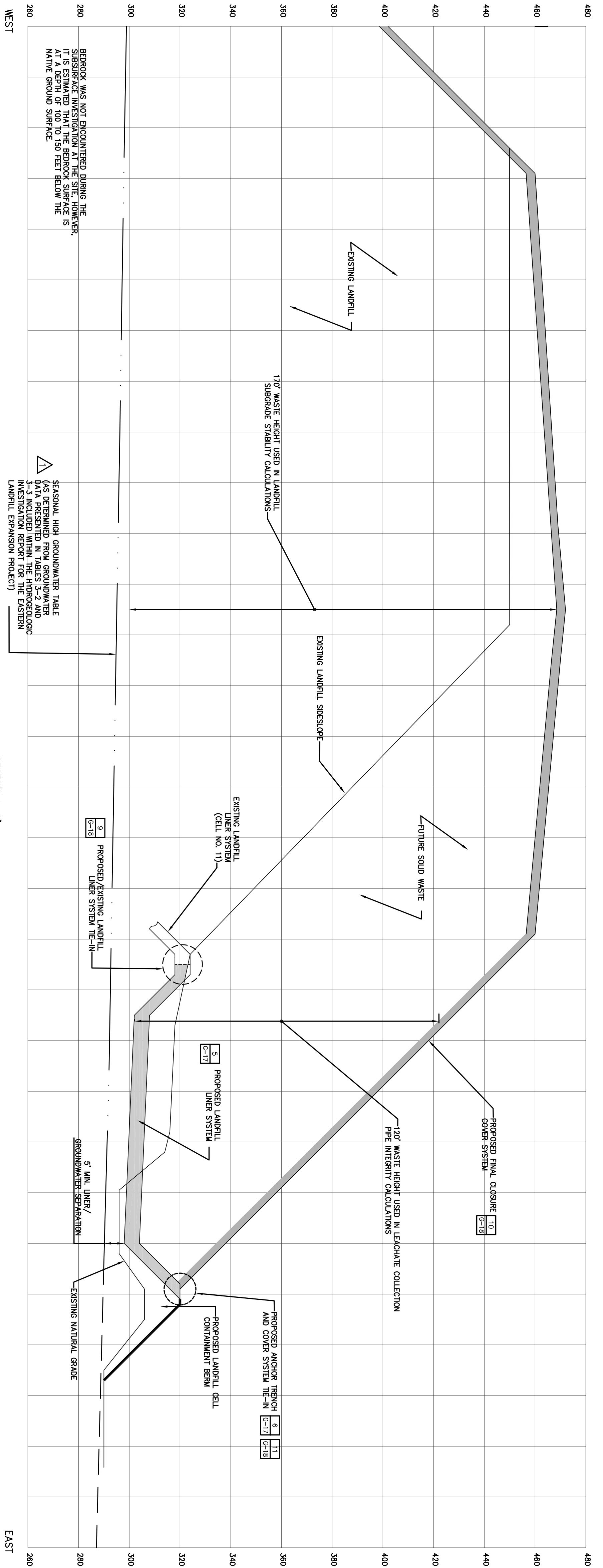
- One 5" piece of innermelt heatshrink
- One 5" piece of Neoprene heatshrink

Note: The innermelt heatshrink will make a clicking noise when the end is pinched together and is slightly darker in colour.

Instructions

1. Slide the innermelt heatshrink over the probe, lining up the end of the heatshrink with the first shoulder on the probe body (see diagram)
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3. Gently press the heatshrink onto the tape with your fingers. Let cool.
4. Slide the outer neoprene heatshrink over the probe, lining up the end of the heatshrink with the second shoulder on the probe body.
5. Apply heat starting in the centre of the neoprene heatshrink working outward.
6. Gently press the heatshrink onto the tape with your fingers.

Attachment 6



Attachment 7

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FOR STATE USE ONLY

APPLICATION FOR VARIANCE FROM 6 NYCRR 360

PROJECT NO.	DATE RECEIVED
DEPARTMENT ACTION <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved	DATE

APPLICATION INSTRUCTIONS ON REVERSE SIDE

1. OWNER'S NAME City of Albany	2. ADDRESS (Street, City, State, Zip Code) One Conners Blvd., Albany, New York 12204	3. Telephone No. 518-432-1144
4. OPERATOR'S NAME City of Albany	5. ADDRESS (Street, City, State, Zip Code) 525 Rapp Road, Albany, New York 12205	6. Telephone No. 518-869-3651
7. ENGINEER'S NAME Clough Harbour & Associates LLP	8. ADDRESS (Street, City, State, Zip Code) III Winners Circle, Albany, New York 12205	9. Telephone No. 518-453-4500

10. PROJECT/FACILITY NAME
Rapp Road Solid Waste Management Facility, Eastern Landfill Expansion

11. PROJECT STATUS <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Proposed <input type="checkbox"/> Existing	12. COUNTY IN WHICH FACILITY IS LOCATED Albany County	13. ENVIRONMENTAL CONSERVATION REGION Region 4
---	--	---

14. DESCRIBE SPECIFIC LOCATION OF FACILITY
The project site is located at 525 Rapp Road, Albany, New York 12205.

15. TYPE OF PROJECT FACILITIES: Composting Transfer Shredding Baling Sanitary Landfill Incineration Pyrolysis
 Resource Recovery-Energy Resource Recovery-Materials Other

16. BRIEFLY DESCRIBE THE PROJECT INCLUDING THE BASIC PROCESS AND MAJOR COMPONENTS
The project is a 14 acre expansion of the Albany Interim Landfill. See Section 2 of the 6 NYCRR Part 360 Permit Application for a detailed description of the project.

17. SPECIFIC PROVISION OF 6 NYCRR 360 FROM WHICH A VARIANCE IS REQUESTED: Section 360-2.13(i) | Paragraph | Variance Request No. 3

18. BRIEFLY DESCRIBE PROPOSED VARIANCE
The variance is sought to allow overfilling on existing Albany Interim Landfill and P4 Landfill cell side slopes that are adjacent to the Eastern Landfill Expansion cell without the construction of a leachate barrier over these existing landfill cell side slopes.

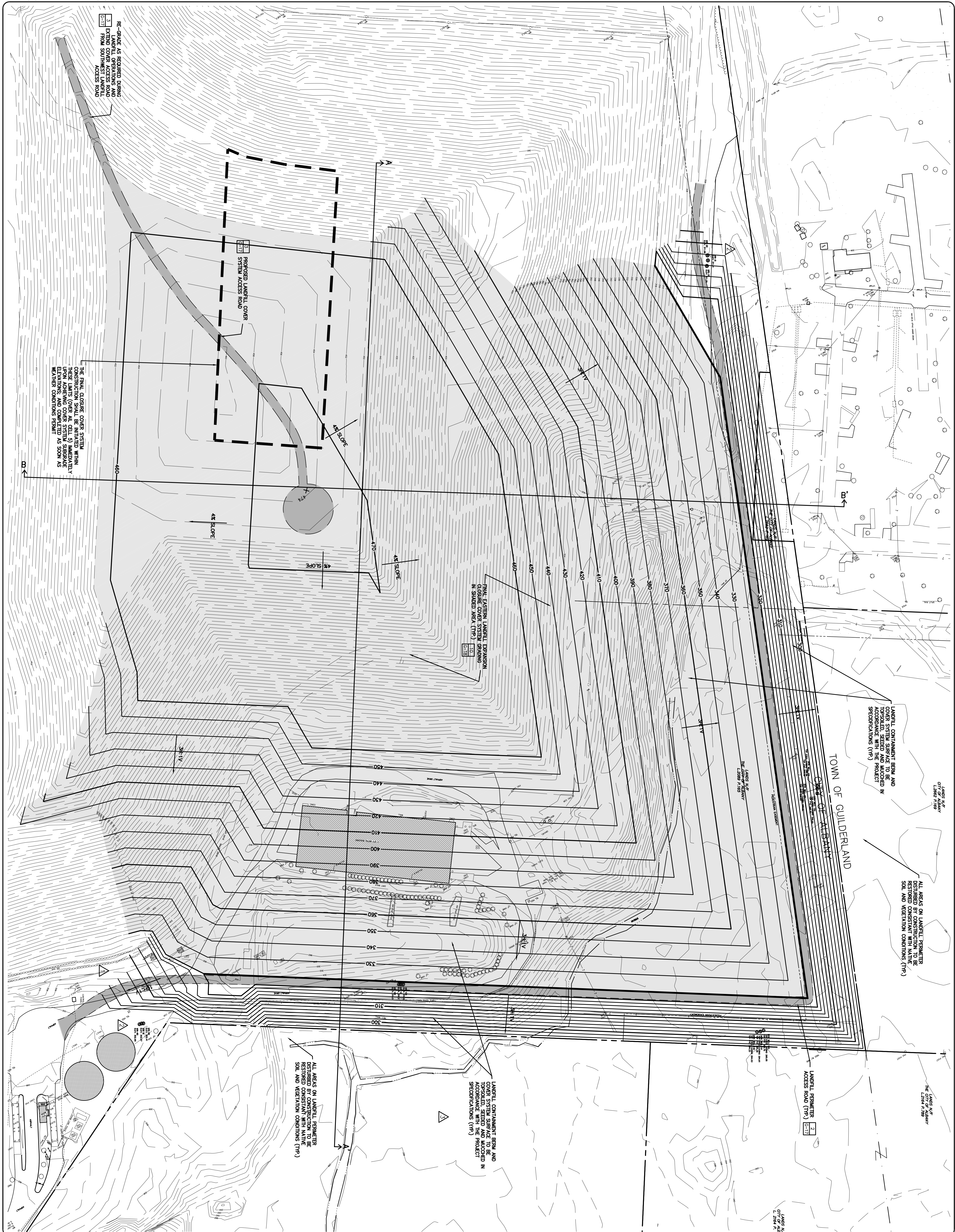
19. IMPACTS OF VARIANCE APPROVAL OR DISAPPROVAL:

a. Environmental impact:
With approval of this variance, there will be no negative environmental impacts; as the AIL and P4 landfill cells are lined with 6 NYCRR Part 360 liner and leachate collection systems. As discussed in the P4 Landfill Permit Application, it is a well documented occurrence that leachate generation decreases and stabilizes with increasing waste height. This is supported by historic site leachate collection data, as well as the H.E.L.P. Model calculations included in the Engineering Report for the Eastern Landfill Expansion. Given this occurrence, and since the Leachate collection systems for the AIL and P4 landfill cells were designed for the high leachate flows associated with the "empty cell" case, overfilling on the AIL and P4 side slopes without the construction of a leachate barrier will not impact the leachate collection systems from a leachate flow perspective in a negative way.

b. Economic Impact:
Approval of this variance will reduce the cost of the Eastern Landfill Expansion liner system construction by \$2,000,000.

CERTIFICATION:
I hereby affirm under penalty of perjury that information provided on this form and attached statements and exhibits is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Date _____ Signature and Title _____



G-11

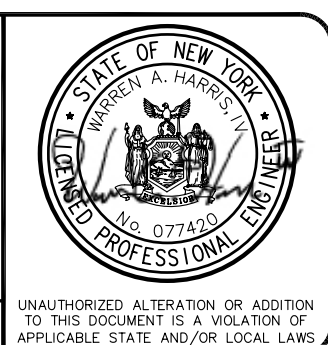
**RAPP ROAD LANDFILL
EASTERN EXPANSION**

**FINAL CLOSURE/LANDSCAPE/
STORMWATER CONTROL PLAN**

Issue Date: 7/07 Project No.: 12206 Scale: 1"=60'

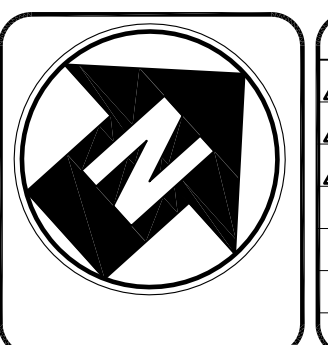
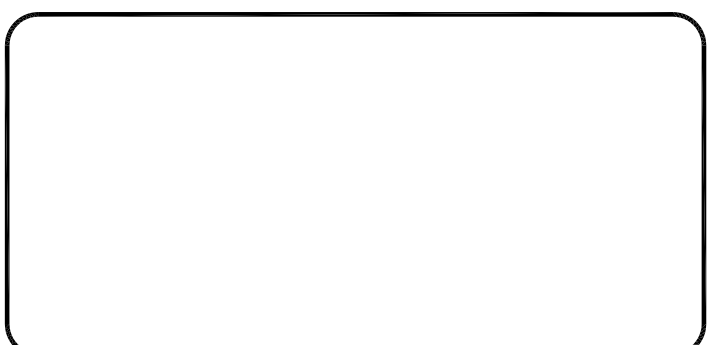
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CHA
CLOUGH HARBOUR & ASSOCIATES LLP
111 Wilshire Circle, PO Box 5289 - Albany, NY 12205-0289
Main: (518) 451-4500 www.cloughharbour.com



**CITY OF ALBANY
DEPARTMENT OF GENERAL SERVICES**

ONE CONNORS BOULEVARD
ALBANY, NEW YORK 12204



No.	Submittal / Revision	App'd	By	Date
△	REMOVED SMALL, OBSCURED TEXT	WAH	CAP	2/22/08
△	ADDED MONITORING WELL LABELS	WAH	CAP	2/22/08
△	REMOVED MONITORING WELLS NOT PART OF PROJECT	WAH	CAP	2/22/08

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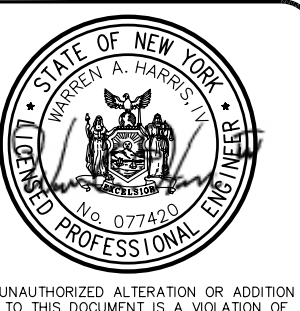
WASTE PLACEMENT SHALL BE COMPLETED
 UNTIL COVER SYSTEMS ARE IN PLACE
 DURING INITIAL OPERATIONS OF THE
 EASTERN LANDFILL EXPANSION CELL

PLACE SOLID WASTE IN THE DIRECTION SHOWN.
 THE MINIMUM OF FIVE FEET AND A MAXIMUM OF TEN FEET
 THICK SUCCESSIVE LIFTS SHALL BE FIVE FEET
 THICK. THE DIRECTION OF SOLID WASTE LIFT PLACEMENT

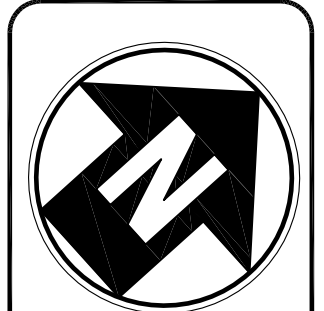
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RAPP ROAD LANDFILL
 EASTERN EXPANSION
 SOLID WASTE PROGRESSION PLAN
 Issue Date: 7/07 Project No.: 12206 Scale:

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No.	Submittal / Revision	App'd	By	Date
△	REMOVED SMALL, OBSCURED TEXT	WAH	CAP	2/22/08
△	ADDED MONITORING WELL LABELS	WAH	CAP	2/22/08
△	REMOVED MONITORING WELLS NOT PART OF PROJECT	WAH	CAP	2/22/08

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