



PURCHASING DEPARTMENT  
DIVISION OF BUDGET & FINANCE

100 West Washington Street, Room 3200 | Hagerstown, MD 21740-4748 | P: 240.313.2330 | F: 240.313.2331  
[www.washco-md.net](http://www.washco-md.net)

**PUR-1360**  
**ADDENDUM NO. 2**  
**INVITATION TO BID**

**CITY/COUNTY LANDFILL GAS MITIGATION**

**DATE: Thursday, November 16, 2017**

**BIDS DUE: Monday, December 4, 2017**  
*(Revised Due Date – Addendum No. 2) 2:00 P.M.*

To Bidders:

This Addendum is hereby made a part of the Contract Documents on which all bids will be based and is issued to correct and clarify the original documents.

Please acknowledge receipt of this Addendum at the appropriate space on the Proposal Form. This Addendum consists of nine (9) pages and six (6) attachments: Attachment A, Attachment B, *Revised* Form of Proposal, *Revised* Schedule of Prices, Bid Bond, and Sub-contractors Listing.

**NOTE: All Bidders must enter the Washington County Administration Complex through either the front door at the 100 West Washington Street entrance or through the rear entrance (w/blue canopy roof) which is handicap accessible, and must use the elevator to access the Purchasing Department to submit their proposal and/or to attend the Pre-Proposal Conference. Alternate routes are controlled by a door access system. Washington County Government has announced new security protocols being implemented at the Washington County Administration Complex at 100 West Washington Street, Hagerstown. The new measures took effect Tuesday, February 14, 2017. The general public will be subject to wand search and will be required to remove any unauthorized items from the building prior to entry. Prohibited items include, but are not limited to: Weapons of any type; Firearms, ammunition and explosive devices; Cutting instruments of any type - including knives, scissors, box cutters, work tools, knitting needles, or anything with a cutting edge, etc.; Pepper spray, mace or any other chemical defense sprays; and Illegal substances.**

**ITEM NO. 1:** *Inquiry:* Although the actual installation and field work associated with the Soil-Bentonite Barrier Wall (SBW) is not a long duration activity, the completion time, 45 days from notice to proceed is not realistic. The scope of work prior to the contractor being able to mobilize construction equipment and personnel requires:

*(NOTE: The wording of all “Inquiries” submitted are displayed exactly as received.)*

- a. Mobilize an auger drilling rig to obtain soil samples representative of the soils to be encountered in the soil-bentonite cut-off wall;
- b. Ship soil samples from the SBBW borings to JLT Laboratories;
- c. JLT's performance of the mix design procedure, and preparation of the Mix Design Report; and
- d. Preparation, submission and acceptance of Submittals as required in the specifications.

The Sequence of Construction shown on Sheet ES-2 indicate an expected duration of 33 days from initial mobilization to completion. The pre-mobilization requirements will likely take at least 4 weeks, thus it is not feasible to execute this project in the 45-day timeframe required in the Invitation to Bid. If possible, please revise this to 120 days as this will reduce or eliminate the Contractors risk of Liquidated Damages for factors outside of their control.

*Response:* All references in the bid document made to the project completion timeframe shall be changed to read: within **one hundred twenty (120) consecutive calendar days from the date of "Notice to Proceed."**

**ITEM NO. 2:** *Inquiry:* Bid item 4 has an approximate quantity is 71,250 VSF, the trench is approximately 1,800 lf and the details and notes in the contract drawings say to terminate the trench at 25 ft, this equates to 45,000 +/- vertical square feet, why the large differential?

*Response:* The volume shown on the original Schedule of Prices is incorrect; a *revised* Schedule of Prices is attached.

**ITEM NO. 3:** *Inquiry:* Bid Item 5, Vertical Passive Vents has a quantity of 10 and a unit of tons, this doesn't seem correct, what is the actual quantity and unit of measure?

*Response:* The quantity is incorrect; a *revised* Schedule of Prices is attached.

**ITEM NO. 4:** *Inquiry:* Subsection 2.1, page 02736-6, requires submitting 2-gallons of groundwater and 5-gallons of site mix water.

- a. Please confirm that the Contractor is to collect groundwater samples from onsite monitoring wells.
- b. Is any groundwater sampling information available as to the recharge and flow rates of these wells?
- c. Is water available onsite for the mix water, or will the Contractor have to provide its own water source for the mix water during the SBBW installation?

(NOTE: The wording of all "Inquiries" submitted are displayed exactly as received.)

*Response:* a. The Contractor is to collect groundwater samples from onsite monitoring wells.

b. Monitoring well construction logs are attached for review. This is the only information that the County has that may assist in determining the recharge and/or flow rates of these wells. MW-1 and MW-5 are the wells closest to the project.

c. No water is available on site, therefore; the Contractor is required to provide the water source for the mix water.

**ITEM NO. 5:** *Inquiry:* Subsection 3.5 (page 02736-8). The testing procedures in the Table Titled “Field Tests Performed by One-Pass Trenching Contractor” appear to the QC testing protocols used for open cut slurry wall methodologies. According to DeWind, this is not their QC protocol. Is DeWind’s standard QC protocol acceptable as they are the specified vendor?

*Response:* Contractors who are contemplating offering an alternate QC protocol shall obtain the County’s written approval. Bidders shall submit the alternate information no later than **4:00 P.M., Wednesday, November 22, 2017**, to the attention of:

Brandi Naugle, CPPB – Buyer  
Washington County Purchasing Department  
Washington County Administration Complex  
100 West Washington Street, Room 3200  
Hagerstown, MD 21740

**ITEM NO. 6:** *Inquiry:* Subsection 3.5, Page 02736-8 paragraph two seems to indicate that sampling is to be done from top middle and bottom of the slurry wall. Is the Contractor to perform sampling and testing from the top, middle and bottom every 200 lf as described in the Subsection?

*Response:* Yes, samples shall be required from the top, middle, and bottom as described in the Subsection.

**ITEM NO. 7:** *Inquiry:* Subsection 3.5, Page 02736-8, Table Titled “Laboratory Testing Performed by One-Pass Trenching Contractor requires, permeability and grain size testing every 200 linear feet. DeWind’s standard QC protocol does not include grain size typically. Is DeWind’s standard QC protocol acceptable?

*Response:* Grain size testing is not required. See Item No. 5 to this Addendum.

**ITEM NO. 8:** *Inquiry:* Subsection 3.5 Page 02736-8 states “The basis of acceptance for the SBBW will be achieving the selected permeability by the Engineer. With less than 10% of all tests achieving the selected permeability.” This

paragraph does not seem to be correct. Did the Engineer really intend to say less than 10% achieving?

*Response:* The intent of this paragraph is that 90% of the tests shall meet or exceed (have lower permeability than) the  $1 \times 10^{-7}$  cm/sec permeability requirement.

**ITEM NO. 9:** *Inquiry:* Additionally, the paragraph states “Laboratory tests performed by the Contractor shall be submitted on a timely matter with expedient delivery of results to avoid delay in constructing the trench”. Will the Contractor have to wait for initial results from the laboratory testing to complete the trench? Do the Owner and Engineer understand that this length of wall will likely be nearly complete or complete by the time the initial sample results are received?

*Response:* It is intended that the pre-mix testing will be a good indicator of any unsuitable characteristics in the Soil-Bentonite mixture. The laboratory tests are intended to keep a record on file that the target parameters of the SBBW design were achieved.

**ITEM NO. 10:** *Inquiry:* Detail 3, Sheet C-10 shows the forcemains bedded in #57 stone and the fiber optic cable surrounded by 6” of sand, the Engineer and Owner do realize that these materials represent a clear pathway for LFG to migrate through the SBBW? Is the Contractor really supposed to leave these conduits in place?

*Response:* Note the following dimensions of the existing utilities, consisting of 2-inch diameter (west) and 3-inch diameter (east) leachate HDPE forcemains, a direct-burial electric cable, and a fiber optic line. The two leachate forcemains are approximately 2-feet apart from one another. From the fiber optic line (east side of the berm) to the existing 2-inch forcemain is approximately 4-feet. The existing electrical cables shown in Detail 3 are inactive/abandoned and are located approximately 2 to 3-feet west of the 2-inch forcemain. A direct-burial electric cable (not shown on Detail 3) is located between the 3-inch forcemain and fiber optic line.

In response to the question, the existing conduits are to remain in place. The bedding material surrounding each existing utility shall be manually removed (by hand) to expose the entire circumference of the utility/conduit for a distance of 3-ft along the length of the utility. As indicated in Note 1 on Sheet C-05, the exposed area shall be backfilled with soil bentonite spoils, which is intended to create a plug of impermeable material along these conduits. It is noted that the proposed passive vent PV-19 to be located near this area is expected to expel any build-up of landfill gas created by this plug and the surrounding SBBW. In addition, a line of existing gas collection vents are

(NOTE: The wording of all “Inquiries” submitted are displayed exactly as received.)

located just north of this area which serves as a back-up in the unlikely event that landfill gas would migrate past this area.

**ITEM NO. 11:** *Inquiry:* During discussions about how to execute this project with DeWind, they have asked if a wider work platform can be provided as they need access to the single-pass trencher from 3 sides and the current Limits of Disturbance will only allow a 20' wide corridor over a large portion of this project. This needs to be on the order of 40-feet wide in their experience. Can the LOD delineation be widened to allow for this, or will equipment be allowed to drive outside of the LOD on the design drawings?

*Response:* The equipment will be allowed to traverse outside the LOD provided no actual disturbance occurs.

**ITEM NO. 12:** *Inquiry:* The maximum depth of the wall is no greater than 25' below ground surface, but is it correct that if refusal is encountered before that then the wall terminates at refusal?

*Response:* If refusal is encountered at a depth shallower than 25-ft bgs due to arriving at the very dense residual layer, as indicated on Drawing Nos. C-05 through C-10, then the wall should be terminated in this layer. However, if refusal is due to contacting an obstacle with limited extent (e.g., boulder, stump, etc.), then the Contractor shall attempt to remove the obstacle or vary the positioning of the wall to continue the wall to the full depth.

**ITEM NO. 13:** *Inquiry:* If the maximum depth of the wall is 25 feet bgs, then why do the borings terminate above 19' bgs. How are we to know what's below that?

*Response:* Please see the attachments to this Addendum with additional subsurface information provided for reference, including: well completion reports for the existing monitoring wells MW-1, MW-2 and MW-5 installed in 1980; boring logs for gas probes GP-1 through GP-5 installed by Environmental Alliance on October 29, 2013; and boring logs B-1 through B-4 installed by Triad Engineering on April 15, 2013.

**ITEM NO. 14:** *Inquiry:* Please clarify the diameter of the bore hole for the passive gas vents within which the No. 57 stone and perforated piping will be placed.

*Response:* The minimum borehole diameter shall be 3-feet.

**ITEM NO. 15:** *Inquiry:* What will be the source for water required during on-pass trenching activities? Is there a water source available onsite or will this need to be hauled in? We are looking at needing roughly 200 gallons/minute during trenching.

*Response:* See Item No. 4 c. to this Addendum.

*(NOTE: The wording of all "Inquiries" submitted are displayed exactly as received.)*

**ITEM NO. 16:** *Inquiry:* Will bid item #5 (vertical passive vents) be paid on a per each price as described in the measurement and payment section? The bid form shows them being paid on a per ton basis.

*Response:* See Item No. 3 to this Addendum.

**ITEM NO. 17:** *Inquiry:* Will the contract award be made strictly off of the base bid total?

*Response:* The award will be based on the Total Base Bid plus the Contingent Items.

**ITEM NO. 18:** *Inquiry:* Can an assumed paving section be provided for the asphalt access road? This will be helpful when estimating its re-construction after trenching activities have been completed.

*Response:* The pavement repair section will include 10” of graded aggregate base and 6” of 19mm asphalt base course.

**ITEM NO. 19:** *Inquiry:* Will a working platform width of 20LF need to be maintained during one-pass trenching? Allowing the contractor to have a 40LF working width will significantly decrease the overall cost of this project.

*Response:* See Item No. 11 to this Addendum.

**ITEM NO. 20:** *Inquiry:* Can clearing debris remain onsite or be hauled to the landfill with no tipping fees charged to the contractor?

*Response:* Trees can be chipped and left on site. Other clearing debris shall be transported to the 40 West Landfill; no tipping fees will be charged.

**ITEM NO. 21:** *Inquiry:* Will construction debris need to be hauled offsite or can they be hauled to the landfill with no tipping fees charged to the contractor?

*Response:* Construction debris shall be transported to the 40 West Landfill; no tipping fees will be charged.

**ITEM NO. 22:** *Inquiry:* Should general soil fill, clay cap material, vegetative subsoil, and topsoil be assumed to be derived from onsite sources? Will any of these materials need to be imported to the site?

*Response:* Soil materials are not available onsite.

**ITEM NO. 23:** *Inquiry:* Can all spoil materials generated during one-pass trenching operations remain onsite or will they need to be hauled off?

*Response:* A significant quantity of spoil materials is not anticipated. Any spoils shall be transported to the 40 West Landfill; no tipping fees will be charged.

**ITEM NO. 24:** *Inquiry:* What should the assumed depth be for the vertical passive vents?

*Response:* The assumed depth shall be 25-feet.

**ITEM NO. 25:** *Inquiry:* Will the fill material for contingency item #C-3 be derived from onsite sources?

*Response:* Soil materials are not available onsite.

**ITEM NO. 26:** *Inquiry:* What will contingency item #C-4 be used for? Should any geotextile fabric be included in this unit price?

*Response:* Class I riprap may be required for miscellaneous stabilization purposes on a contingent basis. No geotextile fabric is to be included in the unit price.

**ITEM NO. 27:** *Inquiry:* What is the contractor's responsibility as far as CQA / testing? There are several places in the contract documents that mention a CQA inspector with differing verbiage about the contractor's responsibility. The same is true with regards to providing testing. Please provide firm clarification.

*Response:* Construction quality assurance (CQA) is being provided by a third party consultant under separate contract with the County, as described in Section 010000 Paragraph 1.7.1  
Material testing is required as specified in each of the specification sections and shall be provided by the Contractor.

**ITEM NO. 28:** *Inquiry:* Specification section 01150-6 mentions the contractor should provide a temporary electrical service for the project. Please provide more information.

*Response:* Temporary electrical service for the project should be provided to meet the needs of the project as determined by the Contractor.

**ITEM NO. 29:** *Inquiry:* Specification section 02933-2 mentions maintenance that will be required until the owner / engineer accept vegetated lawn areas. What are the criteria for this acceptance? Will everything mentioned watering, mowing, repairs, over-seeding, and additional fertilization applications all be a part of this required maintenance? How will this acceptance be handled with the project going into winter?

*Response:* Criteria for acceptance of vegetative stabilization of all disturbed areas will be based on meeting stabilization requirements identified on Drawing No. ES-2 including, but not limited to, General Notes No. 11. Section 02933 Paragraph 3.2 identifies requirements applicable when permanent seeding cannot occur due to time restrictions, such as the winter season. The Contractor will use his/her own discretion as to what measure will be taken to ensure the vegetative growth; this may include additional seeding, fertilization, mowing, or watering. The County understands the seasonal challenges that may occur, the County has always work with the contractor to meet the stabilization requirements while releasing much of the retainage if stabilization is the only issue required to complete the project. The restoration shall be paid under Item 2 – Erosion and Sediment Control.

**ITEM NO. 30:** *Inquiry:* Specification section 02200-7 section C mentions warranty work with regards to settling. This project is being constructed on an existing landfill cap and of course settling will occur. What is the project warranty period? Please provide more information on the contractor’s responsibilities.

*Response:* The SBBW is not being constructed on an existing landfill cap and the overwhelming majority of the installation will occur outside of the limit of waste. Significant settling is not anticipated overtop the SBBW. A one year warranty is expected with this project.

**ITEM NO. 31:** *Inquiry:* Will a tire wash rack / station be required at the rock construction entrance? If so where will the temporary water service be drawn from?

*Response:* No, only a Stabilized Construction Entrance is required.

**ITEM NO. 32:** *Inquiry:* During dewatering operations where can the water be pumped? What is the expectation for leachate segregation? Can clean water be directed towards the creek? Can leachate be pumped into the storage tanks? More detailed information is needed on this topic.

*Response:* Contact with or management of leachate is not anticipated with this project. In the event that leachate is encountered, at the direction of the County, it may be pumped into the existing storage tanks.

**ITEM NO. 33:** *Inquiry:* Do prevailing wage rates apply to this project? If so can they be provided?

*Response:* Prevailing Wage Rate do not apply on this project.

**ITEM NO. 34:** *Inquiry:* I am proposing to add a base bid line item to the bid form for a cost per ton of bentonite. It is my understanding that as part of this project the owner / engineer is asking the contractor to take all the risk with determining a one-pass trenching slurry mixture before testing can be accomplished. By



handling the bid this way you are forcing the contractor to plan for the worst case scenario and inflate pricing. By adding a line item to the bid form for bentonite purchased it would protect everyone and significantly decrease the overall cost of this project. Further discussion may be required.

*Response:* Bidders are to base their costs for Bid Item No. 4 (Soil-Bentonite Barrier Wall) assuming a 3% bentonite mixture (3% by mass). Contingent Item C-5 “Bentonite” has been added to the *revised* Schedule of Prices (as an attachment to this Addendum). In the event that a greater or lesser quantity of bentonite is required to achieve the permeability specified, based on the results of the pre-mix testing, a change order (add or deduct) may be considered based on the actual mass of bentonite used.

**ITEM NO. 35:** *Inquiry:* Will there be a designated place for material storage onsite?

*Response:* The designated area for material storage will be as shown on Drawing C-05.

**ITEM NO. 36:** *Inquiry:* What is the proposed budget for this project?

*Response:* The proposed/estimated budget for this project is between \$1- \$1.5 million.

**ITEM NO. 37:** Bidders shall submit the attached as their bid submittal no later than **2:00 P.M. (EST), Monday, December 4, 2017:**

*Revised* Form of Proposal (*revised 11/16/2017*)  
*Revised* Schedule of Prices (*revised 11/16/2017*)  
Bid Bond  
Sub-contractors Listing

By Authority of:



Rick Curry, CPPO  
Director of Purchasing

# **ATTACHMENT A**

**Boring Logs & Report of Geotechnical Exploration  
(Triad Engineering)**



### Log of Boring: GP-1

**Date Started:** 10/29/13  
**Date Completed:** 10/29/13  
**Total Depth (ft):** 20  
**Boring Diameter (in):** 4.5  
**Bedrock Depth (ft):** N/A  
**Elevation (ft-msl):** N/A  
**Remark:**

**Project Code:** 3383  
**Project Name:** City County Landfill  
**Drilled By:** Davidson Drilling  
**Logged By:** Ann-Mari Peters  
**Drill Rig:** AMS Powerprobe 9500 VTR  
**Drill Method:** Air rotary  
**Sampling Method:** N/A

Depth	Sample Number	Sample Interval	Recovery (inches)	PID	Lithological Description	Interpreted Lithology	Well Construction	Comments
0				0.0	SM: Silty sand, brown, loose.			<ul style="list-style-type: none"> <li>- Well set with 3-ft. stickup with 1"-dia. casing from 3-ft. ags to 7-ft. bgs.</li> <li>- 1"-dia. 0.020-slotted screen from 7 to 12-ft. bgs.</li> <li>- Concrete on surface.</li> <li>- Bentonite from 0 to 6-ft. bgs.</li> <li>- Sand from 6 to 12.5-ft. bgs.</li> <li>- Bentonite from 12.5 to 20-ft. bgs.</li> </ul>
			0.0	SM: Silty sand with trace fine gravel, gray, loose.				
-5			0.0	SM: Silty sand with trace fine gravel, light brown, loose.				
			0.0	SM: Silty sand with fine gravel (40%), brown.				
-15			0.0	GM: Fine gravel with silty sand, dark brown, loose.				
-20								



**Log of Boring: GP-2**

**Date Started:** 10/29/13  
**Date Completed:** 10/29/13  
**Total Depth (ft):** 18.5  
**Boring Diameter (in):** 4.5  
**Bedrock Depth (ft):** N/A  
**Elevation (ft-msl):** N/A  
**Remark:**

**Project Code:** 3383  
**Project Name:** City County Landfill  
**Drilled By:** Davidson Drilling  
**Logged By:** Ann-Mari Peters  
**Drill Rig:** AMS Powerprobe 9500 VTR  
**Drill Method:** Air rotary  
**Sampling Method:** N/A

Depth	Sample Number	Sample Interval	Recovery (inches)	PID	Lithological Description	Interpreted Lithology	Well Construction	Comments
0					SM: Silty sand, brown, soft, loose.		<p>- Well set with 3-ft. stickup with 1"-dia. casing from 3-ft. ags to 9-ft. bgs.            - 1"-dia. 0.020-slotted screen from 9 to 14-ft. bgs.            - Concrete on surface.            - Drill cuttings from 0 to 5-ft. bgs.            - Bentonite from 5 to 8-ft. bgs.            - Sand from 8 to 14.5-ft. bgs.            - Bentonite from 14.5 to 18.5-ft. bgs.</p>	
					SC: Clayey silty fine sand, gray, loose, soft.			
					GC: Clayey silty fine sand with poorly sorted gravel, gray, medium dense.			
-5					GC: Silt with coarse sand and fine gravel, gray, medium dense, small cobble sized rock fragments.			
					SW: Well graded sand, gray, medium dense, trace fine gravel (20%), and coarse gravel (10%).			
-10					GM: Fine gravel with coarse sand, gray, loose.			
					GM: Fine gravel with coarse sand, brown.			
-15					SM: Silty sand, gray, medium dense.			
-20								



**Log of Boring: GP-3**

**Date Started:** 10/29/13  
**Date Completed:** 10/29/13  
**Total Depth (ft):** 15  
**Boring Diameter (in):** 4.5  
**Bedrock Depth (ft):** N/A  
**Elevation (ft-msl):** N/A  
**Remark:**

**Project Code:** 3383  
**Project Name:** City County Landfill  
**Drilled By:** Davidson Drilling  
**Logged By:** Ann-Mari Peters  
**Drill Rig:** AMS Powerprobe 9500 VTR  
**Drill Method:** Air rotary  
**Sampling Method:** N/A

Depth	Sample Number	Sample Interval	Recovery (inches)	PID	Lithological Description	Interpreted Lithology	Well Construction	Comments
0					GM: Silty fine gravel, gray, soft and smooth, gravel becomes coarser with depth.		<p>- Well set with 3-ft. stickup with 1"-dia. casing from 3-ft. ags to 5-ft. bgs.            - 1"-dia. 0.020-slotted screen from 5 to 10-ft. bgs.            - Concrete on surface.            - Bentonite from 0 to 4-ft. bgs.            - Sand from 4 to 10.5-ft. bgs.            - Bentonite from 10.5 to 15-ft. bgs.</p>	
0.0				SM: Silty sand, gray, loose.				
0.0				GP: Fine gravel, gray, medium dense.				
0.0				GC: Clayey silty fine gravel, gray, medium dense, medium soft, less gravel with depth.				
-15								



## Log of Boring: GP-4

**Date Started:** 10/29/13  
**Date Completed:** 10/29/13  
**Total Depth (ft):** 38  
**Boring Diameter (in):** 4.5  
**Bedrock Depth (ft):** N/A  
**Elevation (ft-msl):** N/A  
**Remark:**

**Project Code:** 3383  
**Project Name:** City County Landfill  
**Drilled By:** Davidson Drilling  
**Logged By:** Ann-Mari Peters  
**Drill Rig:** AMS Powerprobe 9500 VTR  
**Drill Method:** Air rotary  
**Sampling Method:** N/A

Depth	Sample Number	Sample Interval	Recovery (inches)	PID	Lithological Description	Interpreted Lithology	Well Construction	Comments
0								
0.0				0.0	SM: Silty sand, light brown, trace gravel, mostly fine, some coarse, lighter in color with depth, gravel becomes finer with depth.			<ul style="list-style-type: none"> <li>- GP-4A Well set with 3-ft. stickup with 1"-dia. casing from 3-ft. ags to 15-ft. bgs.</li> <li>- 1"-dia. 0.020-slotted screen from 15 to 20-ft. bgs.</li> <li>- GP-4B Well set with 3-ft. stickup with 1"-dia. casing from 3-ft. ags to 33-ft. bgs.</li> <li>- 1"-dia. 0.020-slotted screen from 33 to 38-ft. bgs.</li> <li>- Concrete on surface.</li> <li>- Drill cuttings from 0 to 5-ft. bgs.</li> <li>- Bentonite from 5 to 14-ft. bgs.</li> <li>- Sand from 14 to 20-ft. bgs.</li> <li>- Bentonite from 20 to 21-ft. bgs.</li> <li>- Drill cuttings from 21 to 29.5-ft. bgs.</li> <li>- Bentonite from 29.5 to 32-ft. bgs.</li> <li>- Sand from 32 to 38-ft. bgs.</li> </ul>
-5				0.0	SM: Silty sand with coarse sand.			
-10				0.0				
-15				0.0	CL: Silty clay, medium loose.			
-20				0.0	CL: Silty clay with fine gravel, gray, medium loose, gravel increases with depth.			
-25				0.0	GC: Fine gravel in clayey silt, gray, medium loose.			
-30				0.0				
-35				0.0	GC: Clayey silt with fine gravel and coarse sand, gray, medium loose.			
					SM: Clayey silt with coarse sand, gray.			



### Log of Boring: GP-5

**Date Started:** 10/29/13  
**Date Completed:** 10/29/13  
**Total Depth (ft):** 40  
**Boring Diameter (in):** 4.5  
**Bedrock Depth (ft):** N/A  
**Elevation (ft-msl):** N/A  
**Remark:**

**Project Code:** 3383  
**Project Name:** City County Landfill  
**Drilled By:** Davidson Drilling  
**Logged By:** Ann-Mari Peters  
**Drill Rig:** AMS Powerprobe 9500 VTR  
**Drill Method:** Air rotary  
**Sampling Method:** N/A

Depth	Sample Number	Sample Interval	Recovery (inches)	PID	Lithological Description	Interpreted Lithology	Well Construction	Comments
0								
0.0					SM: Silty sand with poorly sorted gravel, brown, low plasticity, coarser gravel at 3.5'.			<ul style="list-style-type: none"> <li>- GP-5A Well set with 3-ft. stickup with 1"-dia. casing from 3-ft. ags to 15-ft. bgs.</li> <li>- 1"-dia. 0.020-slotted screen from 15 to 20-ft. bgs.</li> <li>- GP-5B Well set with 3-ft. stickup with 1"-dia. casing from 3-ft. ags to 35-ft. bgs.</li> <li>- 1"-dia. 0.020-slotted screen from 35 to 40-ft. bgs.</li> <li>- Concrete on surface.</li> <li>- Drill cuttings from 0 to 6-ft. bgs.</li> <li>- Bentonite from 6 to 14-ft. bgs.</li> <li>- Sand from 14 to 20-ft. bgs.</li> <li>- Bentonite from 20 to 21-ft. bgs.</li> <li>- Drill cuttings from 21 to 31-ft. bgs.</li> <li>- Bentonite from 31 to 34-ft. bgs.</li> <li>- Sand from 34 to 40-ft. bgs.</li> </ul>
0.0					SM: Silty sand, dark brown, loose, low plasticity.			
0.0					GM: Fine gravel in silty clay, light brown, loose.			
0.0					SM: Silty sand with fine gravel, light brown.			
0.0					SM: Silty sand with <10% coarse sand, brown.			
0.0					ML: Silt with trace fine sand, gray, loose.			
0.0					CL: Silty clay, gray, soft.			
0.0					CL: Silty clay, dark gray, soft.			
0.0					CL: Silty clay, brown, soft.			
0.0								

C1 4365 SEQUENCE NO. (WRA USE ONLY)

STATE OF MARYLAND  
WELL COMPLETION REPORT  
FILL IN THIS FORM COMPLETELY  
PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN  
30 DAYS AFTER WELL IS COMPLETED  
COUNTY NUMBER 80463

Date Received (WRA use only) 12/22/80  
DATE WELL COMPLETED 9/11/80

Depth of Well 125  
(TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL"  
WA-73-3207

OWNER Washington County Commissioners (TEST WELLS FOR COUNTY LANDFILL SITE)  
STREET OR RFD Court House, Hagerstown, TOWN Maryland, 21740  
SUBDIVISION SECTION LOT

WELL LOG  
Not required for driven wells  
STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET		Check if water bearing
	FROM	TO	
Brown Shale	0	23	
Gray Shale	23	114	
Water	114	115	X
Gray Shale	115	125	

( MONITORING WELLS FOR HAGERSTOWN LANDFILL SITE)

Well #1  
MW-1

WELL HAS BEEN GROUTED (Circle Appropriate Box)  Y  N  
TYPE OF GROUTING MATERIAL  
CEMENT  CM BENTONITE CLAY  BC  
NO. OF BAGS 1 NO. OF POUNDS 100  
GALLONS OF WATER 6  
DEPTH OF GROUT SEAL (to nearest foot) from 0 ft. to 2 ft.

CASING RECORD  
casing types insert appropriate code below  
STEEL  ST CONCRETE  CO  
PLASTIC  PD OTHER  OT

MAIN CASING TYPE PL  
Nominal diameter (top/main) casing (nearest inch) 4  
Total depth of main casing (nearest foot) 115

OTHER CASING (if used) diameter inch depth (feet) from to

SCREEN RECORD  
screen type or open hole insert appropriate code below  
STEEL  ST BRASS  BR OPEN HOLE  HO  
PLASTIC  PD OTHER  OT

DEPTH (nearest ft.) PL 115 125

- CIRCLE APPROPRIATE BOX
- A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
  - E ELECTRIC LOG OBTAINED
  - P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT I HAVE COMPLIED WITH ALL CONDITIONS STATED ON THE ABOVE-CAPTIONED "PERMIT TO DRILL WELL", AND THAT INFORMATION CONTAINED IN THIS REPORT IS TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF.

DRILLERS IDENT. NO. 258  
DRILLERS SIGNATURE [Signature]

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

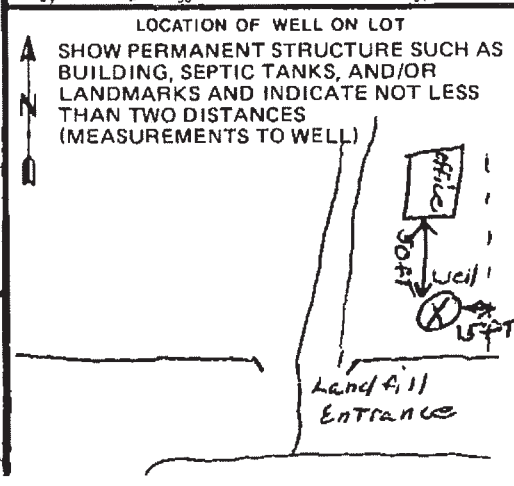
SLOT SIZE 1/16  
DIAMETER OF SCREEN 4 (NEAREST INCH)

GRAVEL PACK 125 3  
IF WELL DRILLED WAS FLOWING WELL CIRCLE BOX  F

WRA USE ONLY (NOT TO BE FILLED IN BY DRILLER)  
T (E.R.O.S.) W Q  
TELESCOPE CASING LOG INDICATOR OTHER DATA

C 3  
PUMPING TEST  
HOURS PUMPED (nearest hour) 1  
PUMPING RATE (gal. per min. to nearest gal.) 10  
METHOD USED TO MEASURE PUMPING RATE Dgm  
WATER LEVEL (distance from land surface) BEFORE PUMPING 40 WHEN PUMPING 125  
TYPE OF PUMP USED (for test)  A air  P piston  T turbine  C centrifugal  R rotary  O other (describe below)  J jet  S submersible

PUMP INSTALLED  
DRILLER WILL INSTALL PUMP (CIRCLE APPROPRIATE BOX)  Y  N  
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE  
TYPE OF PUMP (WRITE APPROPRIATE LETTER IN BOX - SEE ABOVE: (A, C, J, P, R, S, T, O))  S  
CAPACITY: GALLONS PER MINUTE (to nearest gallon) 7  
PUMP HORSE POWER 1.3  
PUMP COLUMN LENGTH (nearest ft.) 110  
CASING HEIGHT (circle appropriate box and enter casing height)  + above LAND SURFACE  - below 2 (nearest foot)





C1 4367 SEQUENCE NO. (WRA USE ONLY)

STATE OF MARYLAND WELL COMPLETION REPORT

THIS REPORT MUST BE SUBMITTED WITHIN 30 DAYS AFTER WELL IS COMPLETED

COUNTY NUMBER 80463

Date Received (WRA use only) 12/22/80 DATE WELL COMPLETED 9/12/80

Depth of Well 90 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" WA-73-3209

OWNER Washington County Commissioners (MONITORING WELLS HAGERSTOWN LANDELL SITE) STREET OR RFD Court House, Hagerstown TOWN Maryland, 21740

WELL LOG table with columns: DESCRIPTION, FEET (FROM, TO), Check if water bearing. Includes entries for Brown Shale, Gray shale, Water, and Gray Shale.

WELL HAS BEEN GROUTED (Y) (N) TYPE OF GROUTING MATERIAL CEMENT BENTONITE CLAY NO. OF BAGS 1 NO. OF POUNDS 100

PUMPING TEST HOURS PUMPED 1 PUMPING RATE 20 METHOD USED TO MEASURE PUMPING RATE Dam WATER LEVEL BEFORE PUMPING 32 WHEN PUMPING 90

CASING RECORD MAIN CASING TYPE PL Nominal diameter 4 Total depth of main casing 80

PUMP INSTALLED YES (Y) NO (N) DRILLER WILL INSTALL PUMP (CIRCLE APPROPRIATE BOX) TYPE OF PUMP (WRITE APPROPRIATE LETTER IN BOX)

OTHER CASING (if used) diameter inch depth (feet) to

SCREEN RECORD screen type or open hole (S) (B) (H) (P) (O) STEEL BRASS BRONZE OPEN HOLE PLASTIC OTHER

PUMP HORSE POWER PUMP COLUMN LENGTH CASING HEIGHT (+) above LAND SURFACE (-) below 2 (nearest foot)

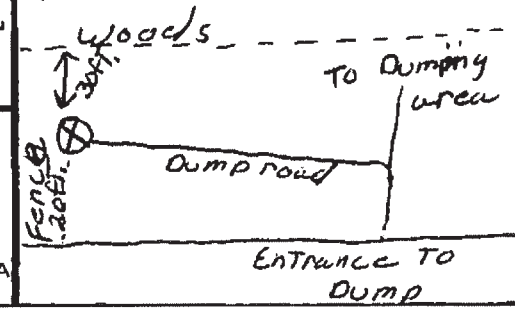
CIRCLE APPROPRIATE BOX [A] A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED [E] ELECTRIC LOG OBTAINED [P] TEST WELL CONVERTED TO PRODUCTION WELL

DEPTH (nearest ft.) 80 90 SLOT SIZE 1/16 DIAMETER OF SCREEN 4 (NEAREST INCH)

LOCATION OF WELL ON LOT SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)

DRILLERS IDENT. NO. 258 DRILLERS SIGNATURE [Signature] SITE SUPERVISOR (sign of driller or journeyman responsible for sitework if different from permittee)

GRAVEL PACK 90 to 3 IF WELL DRILLED WAS FLOWING WELL CIRCLE BOX (F) WRA USE ONLY (NOT TO BE FILLED IN BY DRILLER) TELESCOPE CASING LOG INDICATOR OTHER DATA



Date Received (WRA use only) **12/22/80**

DATE WELL COMPLETED **9/13/80**

Depth of Well **117** (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" **WA-73-3242**

OWNER Washington County Commissioners (MONITORING WELLS HAGERSTOWN LANDFILL SITE)

STREET OR RFD Court House, Hagerstown, TOWN Maryland, 21740

SUBDIVISION \_\_\_\_\_ SECTION \_\_\_\_\_ LOT \_\_\_\_\_

**WELL LOG**  
 Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET		Check if water bearing
	FROM	TO	
Brown Shale	0	30	
Grayshale	30	106	
Water	106	107	X
Gray Shale	107	117	

( MONITORING WELLS HAGERSTOWN LANDFILL SITE)

MW-5  
 MW-5

**GROUTING RECORD**

WELL HAS BEEN GROUTED (Circle Appropriate Box)  Y  N

TYPE OF GROUTING MATERIAL  
 CEMENT  (CM) BENTONITE CLAY  (BC)

NO. OF BAGS 1 NO. OF POUNDS 100

GALLONS OF WATER \_\_\_\_\_

DEPTH OF GROUT SEAL (to nearest foot)  
 from 0 ft to 2 ft

**CASING RECORD**

MAIN CASING TYPE  PL  ST  CO  PD  OT

Nominal diameter (top/main) casing (nearest inch) 4

Total depth of main casing (nearest foot) 107

OTHER CASING (if used) diameter inch \_\_\_\_\_ depth (feet) from \_\_\_\_\_ to \_\_\_\_\_

**SCREEN RECORD**

screen type or open hole  PL  ST  BR  HO  PL  OT

DEPTH (nearest ft.)

EACH SCREEN

1  PL 107 117

2 \_\_\_\_\_

3 \_\_\_\_\_

SLOT SIZE 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_

DIAMETER OF SCREEN 4 (NEAREST INCH)

from 117 to 3

**PUMPING TEST**

HOURS PUMPED (nearest hour) 1

PUMPING RATE (gal. per min. to nearest gal.) 10

METHOD USED TO MEASURE PUMPING RATE Dam

WATER LEVEL (distance from land surface)

BEFORE PUMPING 60

WHEN PUMPING 117

TYPE OF PUMP USED (for test)

A air  P piston  T turbine

C centrifugal  R rotary  O other (describe below)

J jet  S submersible

**PUMP INSTALLED** YES  Y  N

DRILLER WILL INSTALL PUMP (CIRCLE APPROPRIATE BOX)

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE

TYPE OF PUMP (WRITE APPROPRIATE LETTER IN BOX - SEE ABOVE: (A, C, J, P, R, S, T, O))

CAPACITY: GALLONS PER MINUTE (to nearest gallon) \_\_\_\_\_

PUMP HORSE POWER \_\_\_\_\_

PUMP COLUMN LENGTH (nearest ft.) \_\_\_\_\_

CASING HEIGHT (circle appropriate box and enter casing height)

above LAND SURFACE

below 2 (nearest foot)

- CIRCLE APPROPRIATE BOX
- A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
- E ELECTRIC LOG OBTAINED
- P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT I HAVE COMPLIED WITH ALL CONDITIONS STATED ON THE ABOVE-CAPTIONED "PERMIT TO DRILL WELL", AND THAT INFORMATION CONTAINED IN THIS REPORT IS TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF.

DRILLERS IDENT. NO 258

DRILLERS SIGNATURE [Signature]

(MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign of driller or journeyman responsible for sitework if different from permittee)

**GRAVEL PACK** 117 3

IF WELL DRILLED WAS FLOWING WELL CIRCLE BOX  F

WRA USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T (E.R.O.S.)

WQ

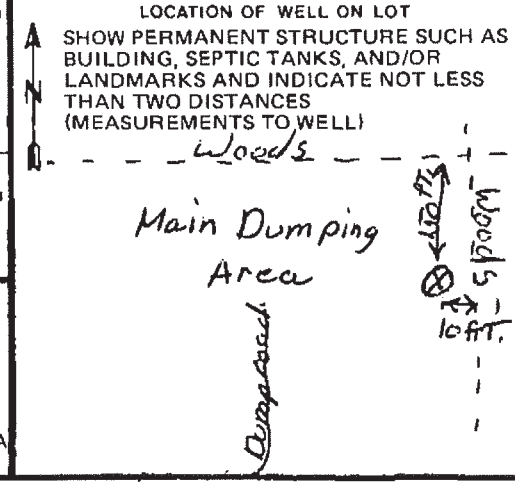
70  TELESCOPE CASING

72  LOG INDICATOR

74  OTHER DATA

75

76



Report of  
Geotechnical Exploration

**City County Landfill Leachate Upgrades  
Washington County, Maryland**

**Triad Project No. 03-11-0258**

Prepared For:

Jay D. Mokotoff, PE, PMP  
Sr. Project Manager, Environmental Engineering  
Manager, Cleveland Waste Management Group  
URS Corporation  
1375 Euclid Avenue, Suite 600  
Cleveland, Ohio 44115

Prepared by:



1075-D Sherman Avenue  
Hagerstown, Maryland 21740  
[www.triadeng.com](http://www.triadeng.com)

May 15, 2013

May 15, 2013

Jay D. Mokotoff, PE, PMP  
Sr. Project Manager, Environmental Engineering  
Manager, Cleveland Waste Management Group  
URS Corporation  
1375 Euclid Avenue, Suite 600  
Cleveland, Ohio 44115

RE: Report of Geotechnical Exploration  
City County Landfill Leachate Upgrades  
Washington County, Maryland  
Triad Project No. 03-11-0258

Dear Mr. Mokotoff:

Triad Engineering, Inc. (Triad) has completed a geotechnical exploration at the site planned for the City County Landfill Leachate Upgrades in Washington County, Maryland. The purpose of the exploration was to evaluate the subsurface conditions at the above referenced site. This report outlines the results of our field exploration and presents our recommendations for design and construction of the geotechnical elements of the project.

We appreciate the opportunity to provide our services on this project. If you have any questions regarding this report, or you require any additional information, please do not hesitate to contact us.

Sincerely,

**TRIAD ENGINEERING, INC.**



Randy L. Moulton, P.E.  
Principal Engineer



Stephen J. Gyuris, P.E.  
Project Engineer



*"Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 40821, Expiration Date: 6/16/2013.*

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## APPENDIX A

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## APPENDIX B

Key to Identification of Soil and Weathered Rock Samples.....	Figure 1
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## APPENDIX C

Results of Laboratory Testing .....	C-1 to C-5
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**Report of Geotechnical Exploration  
City County Landfill Leachate Upgrades  
Washington County, Maryland  
Triad Project No. 03-11-0258**

**SITE AND PROJECT DESCRIPTION**

The proposed project site is located at the existing City County Landfill off of Resh Road in Washington County, Maryland. At the time of our exploration, the site was generally level and covered with fill. We understand that a building was recently demolished at the site. A Site Location Plan, Figure A-1, has been included in Appendix A.

The project will include construction of two new ground supported leachate storage tanks with a nominal capacity of approximately 50,000 gallons each. The tanks will be 25 feet in diameter. We anticipate that the tanks will be supported on ring wall type foundations.

**GEOLOGIC SETTING**

According to the Geologic Map of Washington County, Maryland (1978), as prepared by the Maryland Department of Natural Resources and the Maryland Geological Survey, the site is underlain by the Martinsburg Formation (Om). The general lithology of this formation is described as "Dark brown, dark gray, and black, thin-bedded fissile shale. Thin interbeds of yellow-brown siltstone and greywacke increase in abundance upward with gray sandstone strata at top. Thin-bedded limestone and calcareous shale at base. Estimated thickness 2,000 to 2,500 feet, but no complete section exists in Maryland. Upper part occurs in Bear Pond Mountains, lower part present along Conococheague Creek."

**FIELD EXPLORATION**

The field exploration included 4 test borings drilled at the approximate locations shown on Figure A-2 in Appendix A. The boring locations were determined by URS Corporation and were located in the field by Triad by taping distances from existing site features. Ground surface elevations were not determined. The test borings included Standard Penetration Testing (SPT) and split barrel sampling (ASTM D 1586) at select intervals to planned termination depths.

Geotechnical personnel from our office were present full time during the drilling to direct the drill crew, log all recovered soil and rock samples and observe groundwater and rock conditions. The recovered soil and rock samples were transported to our laboratory for further testing. Detailed descriptions of materials encountered in the test borings are contained on the test boring logs contained in Appendix B.

## SUBSURFACE CONDITIONS

### Subsurface Strata

The materials encountered in the borings are generally described below. Stratification lines indicated on the boring logs represent the approximate boundaries between material types.

**Fill:** Fill was encountered at the ground surface in three (3) of the borings. The fill materials extended to depths ranging from 1.5 to 4 feet below existing grade. The fill generally consisted of tan brown and gray silty shale and gravel. Based on SPT N-values varying from 9 to 29 blows per foot, the fill materials exhibited a medium dense relative density.

**Residual Soils:** Residual soils were encountered at the ground surface at boring B-4 and below the fill in the other borings. The residual soils generally consisted of tan brown, greenish brown and tan orange gravelly silt, silty sand and silty shale. Based on SPT N-values varying from 10 blows per foot to more than 50 blows per foot, the residual soils exhibited a loose to very dense relative density, with the majority exhibiting a medium dense to dense relative density.

### Groundwater Observations

Groundwater was not present in any of the borings during or upon completion of the drilling operations. It is important to note that fluctuations in groundwater levels may occur due to variations in environmental conditions, recent precipitation events, surface drainage, and other factors which may not have been evident at the time measurements were made and reported herein.

## LABORATORY TESTING

Laboratory tests were performed to supplement the field classifications and establish design criteria. All laboratory tests were performed in general accordance with appropriate ASTM standard test methods. Detailed results of the laboratory tests are contained in Appendix C. A summary of the test results is presented below:

TEST TYPE	TEST RESULTS
Natural Moisture Contents	9.0 % to 23.5 %
Atterberg Limits: Liquid Limit Plasticity Index	26 and 32 5 and 8
Percent Passing No. 200 Sieve	32.5 % to 47.3 %
USCS Soil Classification	SC-SM

## **CONCLUSIONS AND RECOMMENDATIONS FOR DESIGN**

The subsurface information obtained from the field investigation, our past experience with similar projects and the noted design criteria were the basis for our assessment of the geotechnical issues currently existing at the site. Our recommendations associated with the design and construction of foundations and base slab are presented in the following sections of this report.

### **Discussion – Existing Fill**

As mentioned previously, existing fill materials were encountered in several of the borings. These materials were likely generated during the recent demolition at the site. No records regarding placement of these materials have been provided. Therefore, we assume that this material is uncontrolled fill. It is our opinion that these materials are not suitable for support of the proposed tanks and should be removed in their entirety.

We understand that a building was recently demolished at the site. Any unsuitable old fill, existing structure foundations, slabs, sidewalks, pavement, utilities, foundation walls and miscellaneous debris generated during the demolition work should be completely removed and should be replaced with new controlled fill. In addition, any abandoned utilities should be field located and removed as part of the overall site development. Any existing unsuitable old fill and/or features as previously noted should be completely removed to depths of suitable soils and extending horizontally beyond the limits of the structures and pavement a minimum distance of 5 feet.

### **Foundations and Base Slab**

It is our opinion that the proposed tanks can be supported on conventional shallow foundations designed based on a maximum allowable bearing pressure of 3,000 psf. A minimum width of 24 inches for the continuous ring wall foundations should be considered. Exterior foundations should be designed and constructed to bear at least 30 inches below the final outside grade for frost protection. We recommend that a modulus of subgrade reaction, "k", equal to 110 pci be adopted for design of the base concrete support slab.

We recommend that all tank foundations and base slab be constructed to bear on a 1-foot minimum thickness of compacted well graded crushed aggregate such as MDSHA CR-6 to control differential movement. Fill material placed below and extending beyond the foundations should be compacted to at least 95 percent of the laboratory maximum dry density as determined by the Modified Proctor method (ASTM D 1557). Well graded crushed aggregate should also be extended laterally beyond the limits of the foundations a minimum distance of 1 foot.

We estimate that total settlements for foundations bearing on approved residual soils and/or new controlled fill will be one (1) inch or less. Differential settlements are anticipated to be one-half of the total settlements. Differential settlements along



continuous footings are not expected to exceed an angular distortion of 0.0015 inch/inch.

### **Seismic Classification**

We recommend that a Site Class C be utilized for seismic evaluation for the proposed foundations. This classification is based on the International Building Code (IBC) criteria.

### **Lateral Earth Pressures**

Concrete walls will be subject to either active or at-rest lateral earth pressures. For walls which are permitted to rotate or translate slightly at the top, this represents an active condition with an active earth pressure. However, for rigid walls with movement restricted, this presents an at-rest condition.

For the soils present at the site and new controlled fill consisting of soils similar to the on-site soils along with an assumed level backfill slope, we recommend that an active equivalent fluid pressure ( $\gamma K_a$ ) of 45 psf per foot of height be used for evaluation and design. For at-rest conditions, an equivalent fluid pressure ( $\gamma K_o$ ) of 70 psf per foot of height is recommended.

Any surcharge loads anticipated at the surface, such as those applied by the hydrostatic pressures exerted on the tank slab, should be multiplied by 0.5 and superimposed as a uniform horizontal pressure on the recommended design lateral loading. The coefficient of friction utilized for determination of sliding resistance on the base of foundation elements bearing on residual soils or new controlled fill soils should be 0.42. However, the coefficient of friction utilized for determination of sliding resistance on the base of foundation elements bearing on a minimum of 1 foot of well-graded crushed aggregate should be 0.55.

The lateral pressure values recommended above do not include additional hydrostatic pressures and are based on adequate drainage behind the walls without build-up of hydrostatic pressures. Consequently, a permanent backwall drainage system should be constructed along below grade walls.

## **CONSTRUCTION RECOMMENDATIONS**

### **Site Preparation**

Initial site clearing and grubbing should also include removal of the uncontrolled fill and any other deleterious materials within the footprint of the proposed structure and extending five (5) feet beyond the perimeter. After removal of the unsuitable materials, the subgrade soils should be visually examined and approved and heavily proof-rolled with approved construction equipment to locate isolated soft spots or areas of excessive "pumping" which are too wet to accommodate compacted fill or tank construction. These areas should either be scarified, air-dried to a sufficient moisture content and re-compacted prior to fill placement, mechanically stabilized, or excavated to a level of

stable soils. The exposed subgrade should be observed and tested by Triad personnel prior to placement of compacted fill.

### **Excavation Areas**

In general, the fill and residual soils present can be excavated with conventional earth moving equipment such as backhoes, pans and tracked loaders. Dense weathered materials encountered can probably be removed to greater depths utilizing a large tracked dozer and excavators. In areas where very dense materials are encountered (greater than 50 blows per increment), larger ripping equipment is sometimes required for more effective removal depending on the size of the excavation and orientation of the material stratification. If hard bedrock is encountered, blasting and/or hoe-ramming would be required for effective removal. Any blasting should be performed in strict accordance with local and state regulations. All utility trenches should be sloped and/or supported in accordance with current Occupational Safety and Health Administration (O.S.H.A.) requirements.

During excavation operations, dry conditions should be maintained within the cut areas at all times in order to minimize the need for additional undercutting or aeration of soils. The contractor should be prepared to implement temporary de-watering measures in these areas during construction. All cut areas should be sealed at the end of each day, to the extent which construction practicality will permit, to help prevent infiltration of precipitation and subsequent unsuitable soil conditions.

### **Controlled Fill**

#### **Satisfactory Soils**

On-site materials removed from required excavations can be used for general site fill provided that compaction criteria are strictly maintained. These materials are suitable for general site fill and controlled fill to depths of 1 foot below proposed bearing elevations of the tank foundations and base slab. Fill material placed within 12 inches of the tank foundation and base slab should consist of well-graded crushed aggregate such as MDSHA CR-6.

Fill materials should not contain any debris, waste, or frozen materials, and they should contain less than two (2) percent vegetation-organic materials by weight. Also, materials classified as CH, MH, OL, OH, or Pt are not suitable for use as structural fill. The on-site soils are generally suitable for re-use as structural fill provided that proper drainage, grading, and sloping away from the structure is maintained both during and after construction.

All proposed fill materials should be approved by a geotechnical engineer prior to placement as controlled fill, and representative samples should be submitted by the contractor one week prior to placement of that material to allow time for completion of the necessary laboratory tests.

## **Placement and Compaction**

Before compaction, each layer should be moistened or aerated as necessary to obtain the required compaction. Each layer should be compacted to the required percentage of maximum dry density. Fill should not be placed on surfaces that are muddy or frozen, or have not been approved by testing and/or proof-rolling. Free water should be prevented from appearing on the surface during or subsequent to compaction operations.

Soil material which is removed because it is too wet to permit proper compaction can be stockpiled or spread and allowed to dry. Drying can be facilitated by discing or harrowing until the moisture content is reduced to an acceptable level. When the soil is too dry, water should be applied uniformly to the subgrade surface or to the layer to be compacted.

All fill material compacted by heavy compaction equipment should be placed in maximum 10-inch loose lifts. All fill material compacted by hand-operated tampers or light compaction equipment should be placed in maximum 4-inch loose lifts. Fill material placed below and extending five (5) feet beyond the foundations for the structure should be compacted to at least 95 percent of the laboratory maximum dry density as determined by the Modified Proctor method (ASTM D 1557). The moisture content of the soils should be at or within two (2) percentage points of the optimum moisture content.

## **Foundation Construction**

We anticipate that conventional earth excavation equipment such as a backhoe can be utilized to excavate the residual soils or controlled fill for foundation construction. Any foundation excavations which encounter hard rock will require hoe ram chipping to attain required bearing elevations. We recommend that any loose materials present at the bottom of footing excavations as a result of excavation operations be re-compacted in order to minimize differential settlements. Any isolated soft areas that may be encountered during foundation excavations for the structures should be removed to underlying firm materials. Widening of over-excavations will also be required if soft conditions are encountered. Detailed recommendations can be provided at the time of construction if these conditions are present.

Foundation concrete should be placed the same day that excavations are completed to reduce the potential for softening due to precipitation and/or runoff. All foundation excavations for the proposed structures should be examined by a geotechnical engineer or a qualified representative from our office prior to placing concrete to confirm that the required bearing support is available.

## **Construction Monitoring**

We recommend that Triad be retained to monitor the construction activities to verify that the field conditions are consistent with the findings of our exploration. If significant variations are encountered, or if the design is altered, we should be notified.

Triad should provide personnel as required to observe all excavations and document proof-rolling prior to fill placement. In addition, all fill material should be monitored, tested and approved during fill construction. Field density tests should be performed in accordance with ASTM D 2922 (nuclear method). A minimum of three field density tests should be performed for each lift of fill placed or a minimum of every 2,500 square feet of fill placed to confirm the required soil compaction.

### **LIMITATIONS**

This geotechnical engineering report has been prepared by Triad for the exclusive use of URS Corporation and their design team for specific application to the proposed City County Leachate Upgrades located in Washington County, Maryland. The work on the project has been carried out in accordance with reasonable and acceptable engineering practices. No other warranty, either written or implied, is applicable to this project.

Subsurface conditions will likely vary from those encountered at the test locations. The logs are intended to only represent the conditions at each location when the sampling occurred. Classifications of the recovered soil samples are based on recognized standards.

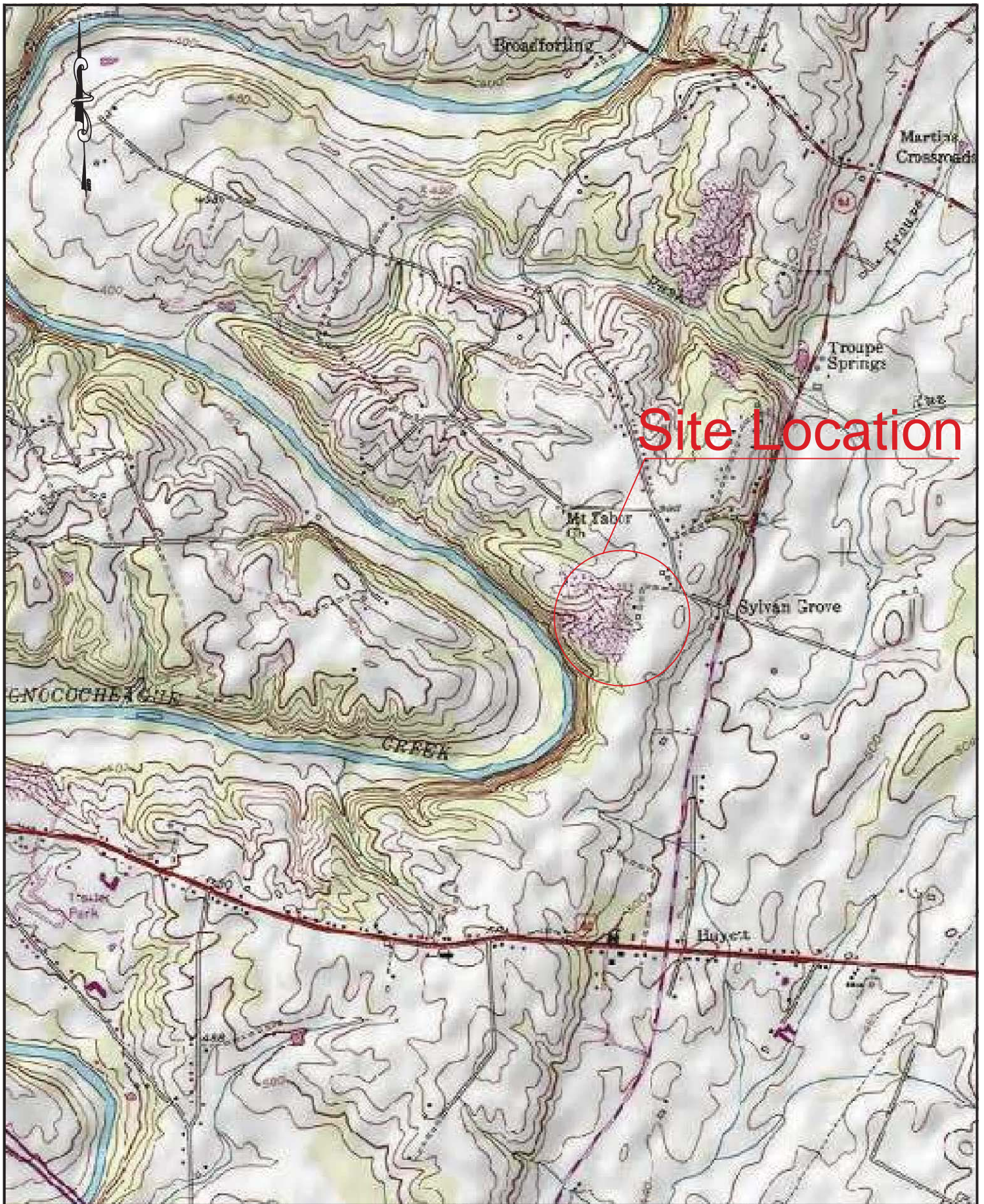
The interpretations and recommendations in this report are based solely on the information available at the time this report was prepared. In the event that the location or design of the structures is altered, the conclusions and recommendations presented herein should not be considered valid unless we have been given the opportunity to review the changes.

It is **strongly** recommended that we be provided the opportunity for a general review of the final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented. If we are not accorded the privilege of making this review, we can assume no responsibility for misinterpretation of our recommendations.

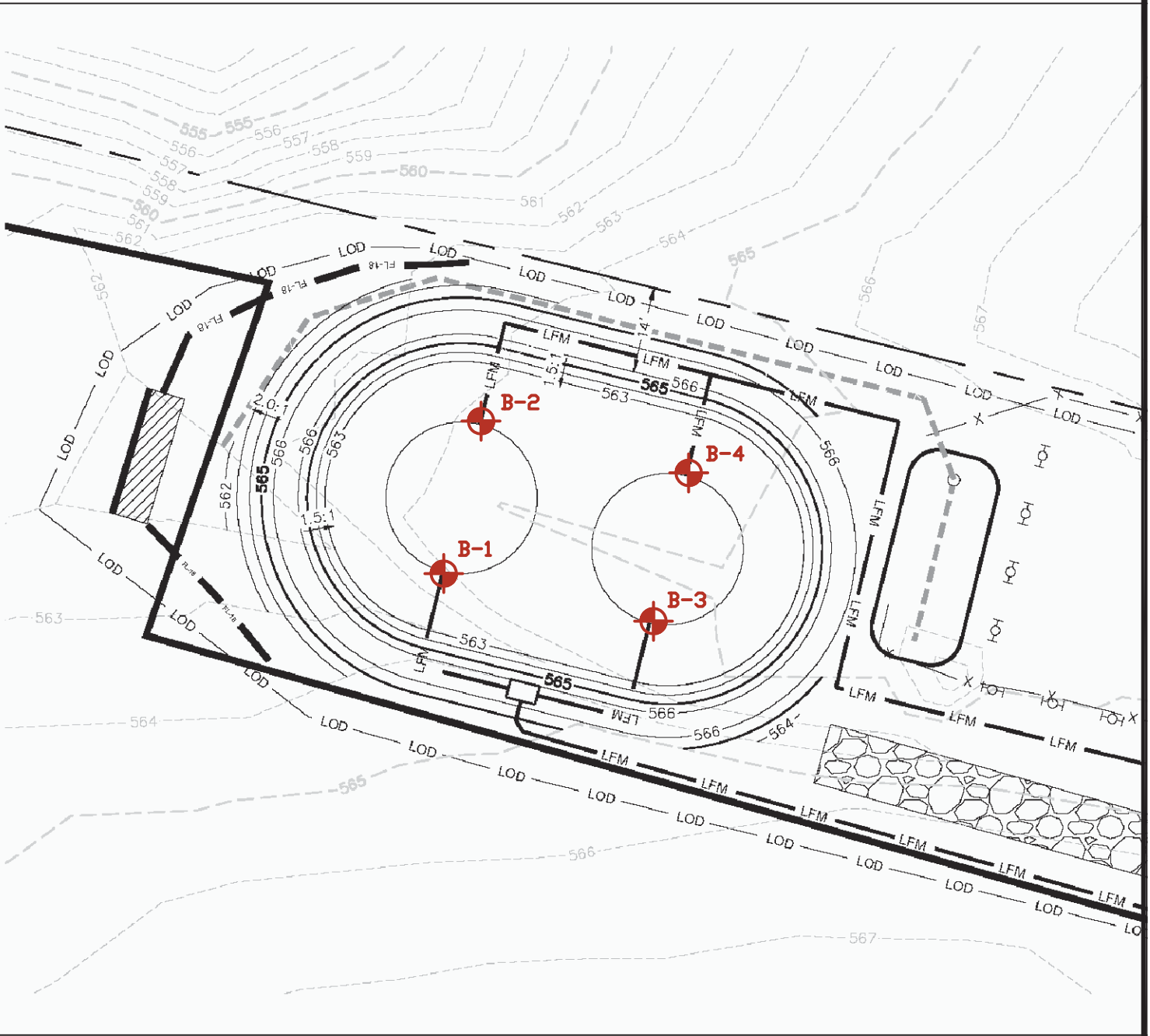
The nature and extent of variations between exploration locations and observed conditions may not become evident until construction. It is suggested that we be retained to provide continuous soil engineering services during the earthwork and foundation construction phases of the work. This is to observe compliance with the design concepts, specifications and/or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to construction.

# APPENDIX A

## *Illustrations*



Hagerstown Quadrangle		<b>Site Location Plan</b>		 <b>TRIAD ENGINEERING, INC.</b> <a href="http://www.triadeng.com">www.triadeng.com</a>
DRAWN BY: SJK	CHECKED BY: RLM	City County Landfill Leachate Upgrades Washington County, Maryland		
DATE: 4/17/13	SCALE: N/A	PROJECT NO: 03-11-0258	Figure No.: A-1	



 **B-#** Approximate Test Location

### Boring Location Plan



DRAWN BY: SJG  
CHECKED BY: RLM

City County Landfill Leachate Upgrades  
Washington County, Maryland

DATE: 4/17/13  
SCALE: N/A

PROJECT NO.: 03-11-0258  
Figure No.: A-2

# APPENDIX B

## *Field Exploration*



## TRIAD ENGINEERING, INC.

### KEY TO IDENTIFICATION OF SOIL AND WEATHERED ROCK SAMPLES

The material descriptions on the logs indicate the visual identification of the soil and rock recovered from the exploration and are based on the following criteria. Major soil components are designated by capital letters and minor components are described by terms indicating the percentage by weight of each component. Standard Penetration Testing (SPT) and sampling was conducted in accordance with ASTM D1586. N-values in blows per foot are used to describe the *relative density* of coarse-grained soils or the *consistency* of fine-grained soils.

The MAJOR components constitute more than 50% of the sample and have the following size designation.		The MINOR components have the following percentage designation.	
<u>COMPONENT</u>	<u>PARTICLE SIZE</u>	<u>ADJECTIVE</u>	<u>PERCENTAGE</u>
Boulders	12 inches plus	and	35 - 50
Cobbles	3 to 12 inches		
Gravel.....-coarse..	¾ to 3 inches	some	20 - 35
-fine	#4 to ¾ inches		
Sand.....-coarse	#10 to #4	little	10 - 20
-medium	#40 to #10		
-fine	#200 to #40		
Silt or Clay	Minus #200. (fine-grained soil)	trace	0 - 10
<u>Relative Density – Coarse-grained Soils</u>		<u>Consistency – Fine-grained Soils</u>	
<u>Term</u>	<u>N-Value</u>	<u>Term</u>	<u>N-Value</u>
Very Loose	• 4	Very Soft	• 2
Loose	5 to 10	Soft	3 to 4
Medium Dense	11 to 30	Medium Stiff	5 to 8
Dense	31 to 50	Stiff	9 to 16
Very Dense	>50	Very Stiff	>16
<u>Soil Plasticity</u>	<u>Plasticity Index (PI)</u>	<u>Rock Hardness</u>	
None	Nonplastic	<u>Term</u>	<u>N-Value</u>
Low	1 to 5	Very Weathered	• 50/.5
Medium	5 to 20	Weathered	50/.4
High	20 to 40	Soft	50/.3
Very High	over 40	Medium hard	50/.2 to 50/.1
<u>Moisture Description</u>		Hard	Auger Refusal
Dry - Dusty, dry to touch		<h2 style="margin: 0;">FIGURE NO. 1</h2>	
Slightly Moist - damp			
Moist - no visible free water			
Wet - visible free water, saturated			

# BORING LOG

Project Number: **03-11-0258**    Project Name: **City County Landfill-Leachate Upgrades**    Boring No.: **B-1**  
 Inspector: **JRW**    Boring Location: **See Figure A-2**  
 Date Started: **4/15/13**    Drill/Method: **CME-55/HSA**  
 Date Completed: **4/15/13**    Driller: **KBA**    Ground Elev.: \_\_\_\_\_

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-around; font-size: small;"> <div style="display: flex; flex-direction: column; gap: 5px;"> <div><span style="display: inline-block; width: 15px; height: 15px; background-color: black; margin-right: 5px;"></span> Shelby Tube</div> <div><span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; margin-right: 5px;"></span> Core Sample</div> </div> <div style="display: flex; flex-direction: column; gap: 5px;"> <div><span style="display: inline-block; width: 15px; height: 15px; border: 1px dashed black; margin-right: 5px;"></span> Standard Split Spoon</div> <div><span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; margin-right: 5px;"></span> Auger Probe</div> </div> </div>		RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION						
	1	X	4-6-12	▲ 100%			Tan brown silty <b>SHALE</b> , medium dense, trace sand, moist				▨		
	2	X	4-6-10	▲ 100%		4.0			- FILL -				▨
5.0	3	X	6-9-11	▲ 100%			Tan orange silty <b>SAND</b> , medium dense, little gravel, moist				▨		
	4	X	8-9-12	▲ 100%		8.5			- RESIDUUM -				▨
10.0	5	X	15-50	▲ 100%			Tan brown silty <b>SHALE</b> , medium dense, little sand, moist				▨		
15.0	6	X	40-50/2"	▲ 100%		19.2			- RESIDUUM -				▨
20.0	BORING TERMINATED AT 19.2 FEET												
25.0													
30.0													

TRIAD\_C - REVISED 03-11-0258 CITY COUNTY LANDFILL-LEECHATE UPGRADES.GPJ 03-11-0062 EMMITSBURG WWTP ENR UPGRADE.GPJ 4/17/13





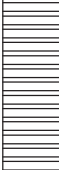

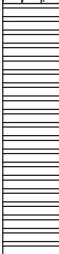


1705 D SHERMAN AVE  
 HAGERSTOWN, MD 21740  
 P: 301.797.6400  
 F: 301.797.2424

Remarks: Boring dry during and upon completion of drilling.

# BORING LOG

Project Number: **03-11-0258**    Project Name: **City County Landfill-Leachate Upgrades**    Boring No.: **B-2**  
 Inspector: **JRW**    Boring Location: **See Figure A-2**  
 Date Started: **4/15/13**    Drill/Method: **CME-55/HSA**  
 Date Completed: **4/15/13**    Driller: **KBA**    Ground Elev.: \_\_\_\_\_

TRIAD\_C - REVISED 03-11-0258 CITY COUNTY LANDFILL-LEECHATE UPGRADES.GPJ 03-11-0062 EMMITSBURG WWTP ENR UPGRADE.GPJ 4/17/13

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	Legend		MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							<input type="checkbox"/> Shelby Tube <input type="checkbox"/> Core Sample	<input type="checkbox"/> Standard Split Spoon <input type="checkbox"/> Auger Probe					
1.5	1	X	1-3-6	44%		1.5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Tan brown silty <b>SHALE</b> , medium dense, little sand, moist - FILL -				
3.0	2	X	3-7-11	100%			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Tan brown silty <b>SHALE</b> , medium dense, trace sand, moist				
5.0	3	X	6-8-10	100%			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	- RESIDUUM -				
8.5	4	X	12-11-14	100%		8.5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Tan brown silty <b>SAND</b> , dense, little gravel, moist				
13.5	5	X	26-50/2"	225%		13.5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	- RESIDUUM -				
15.0									Tan brown silty <b>SHALE</b> , very dense, little sand, moist				
18.9	6	X	50/4"	100%		18.9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	- RESIDUUM - BORING TERMINATED AT 18.9 FEET				



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 HAGERSTOWN, MD 21740  
 P: 301.797.6400  
 F: 301.797.2424

Remarks: Boring dry during and upon completion of drilling.





# BORING LOG

Project Number: **03-11-0258**  
 Inspector: **JRW**  
 Date Started: **4/15/13**  
 Date Completed: **4/15/13**

Project Name: **City County Landfill-Leachate Upgrades**  
 Boring Location: **See Figure A-2**  
 Drill/Method: **CME-55/HSA**  
 Driller: **KBA**

Boring No.: **B-3**  
 Ground Elev.: \_\_\_\_\_

TRIAD\_C - REVISED 03-11-0258 CITY COUNTY LANDFILL-LEECHATE UPGRADES.GPJ 03-11-0062 EMMITSBURG WWTP ENR UPGRADE.GPJ 4/17/13

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-around; font-size: small;"> <span>■ Shelby Tube</span> <span>⊠ Standard Split Spoon</span> </div> <div style="display: flex; justify-content: space-around; font-size: small;"> <span>▨ Core Sample</span> <span>⊞ Auger Probe</span> </div>		MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
0.0	1	⊠	11-7-22	100%		2.5			Tan brown and gray silty <b>GRAVEL</b> , medium dense, little sand, moist  - FILL -				
2.5	2	⊠	8-6-5	100%		5.5			Greenish brown gravelly <b>SILT</b> , medium dense, trace sand, moist  - RESIDUUM -				
5.0	3	⊠	4-7-8	100%		8.5			Tan orange gravelly <b>SILT</b> , medium dense, trace sand, moist  - RESIDUUM -				
8.5	4	⊠	10-9-12	100%		18.9			Tan brown silty <b>SHALE</b> , medium dense, trace sand, moist  - very dense				
15.0	5	⊠	24-50/4"	100%									
20.0	6	⊠	50/4"	100%									
20.0	BORING TERMINATED AT 18.9 FEET												



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 HAGERSTOWN, MD 21740  
 P: 301.797.6400  
 F: 301.797.2424

Remarks: Boring dry during and upon completion of drilling.

# BORING LOG

Project Number: **03-11-0258**    Project Name: **City County Landfill-Leachate Upgrades**    Boring No.: **B-4**  
 Inspector: **JRW**    Boring Location: **See Figure A-2**  
 Date Started: **4/15/13**    Drill/Method: **CME-55/HSA**  
 Date Completed: **4/15/13**    Driller: **KBA**    Ground Elev.: \_\_\_\_\_

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-around; font-size: small;"> <span>■ Shelby Tube</span> <span>⊠ Standard Split Spoon</span> </div> <div style="display: flex; justify-content: space-around; font-size: small;"> <span>▬ Core Sample</span> <span>⊏ Auger Probe</span> </div>		RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION						
0.0	1	⊠	4-6-4	▲ 22%			Tan brown silty <b>SHALE</b> , loose, trace sand, moist  - medium dense  - dense  - very dense						
5.0	2	⊠	6-11-14	▲ 100%									
10.0	3	⊠	10-13-20	▲ 100%									
15.0	4	⊠	7-18-26	▲ 100%									
20.0	5	⊠	17-33-50/3"	▲ 100%									
20.0	6	▬	50/1"	▲ 100%		18.6	- RESIDUUM - BORING TERMINATED AT 18.6 FEET						
25.0													
30.0													

TRIAID\_C - REVISED 03-11-0258 CITY COUNTY LANDFILL-LEECHATE UPGRADES.GPJ 03-11-0062 EMMITSBURG WWTP ENR UPGRADE.GPJ 4/17/13



1705 D SHERMAN AVE  
 HAGERSTOWN, MD 21740  
 P: 301.797.6400  
 F: 301.797.2424

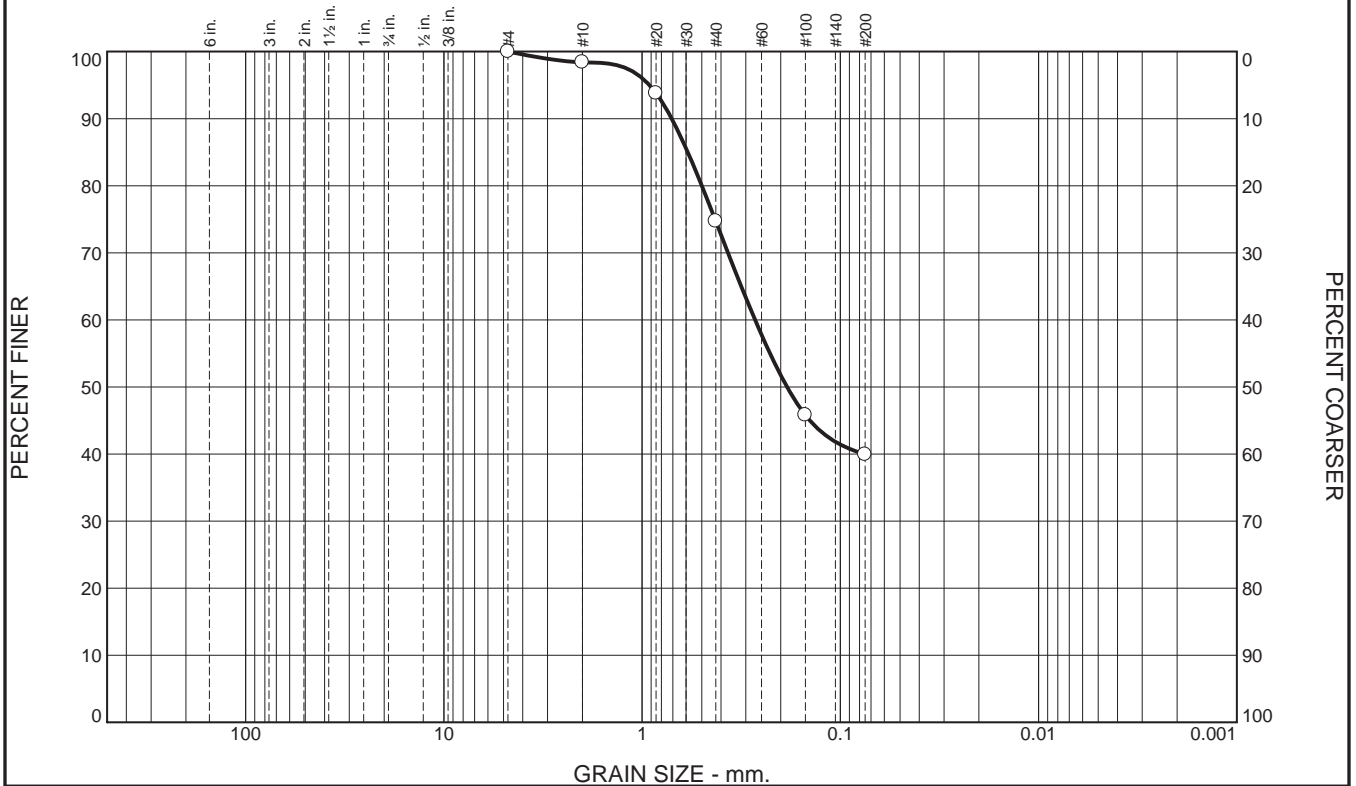
Remarks: Boring dry during and upon completion of drilling.

# APPENDIX C

## *Laboratory Testing*



# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.6	23.7	34.8	39.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	98.4		
#20	93.8		
#40	74.7		
#100	45.8		
#200	39.9		

**Soil Description**

Tan brown silty SAND, trace gravel.

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>90</sub>= 0.7085                      D<sub>85</sub>= 0.5883                      D<sub>60</sub>= 0.2693

D<sub>50</sub>= 0.1857                      D<sub>30</sub>=                                      D<sub>15</sub>=

D<sub>10</sub>=                                      C<sub>u</sub>=                                      C<sub>c</sub>=

**Classification**

USCS=                                      AASHTO=

**Remarks**

\* (no specification provided)

Source of Sample: Jar                      Depth: 5.0'-6.5'  
 Sample Number: B-1

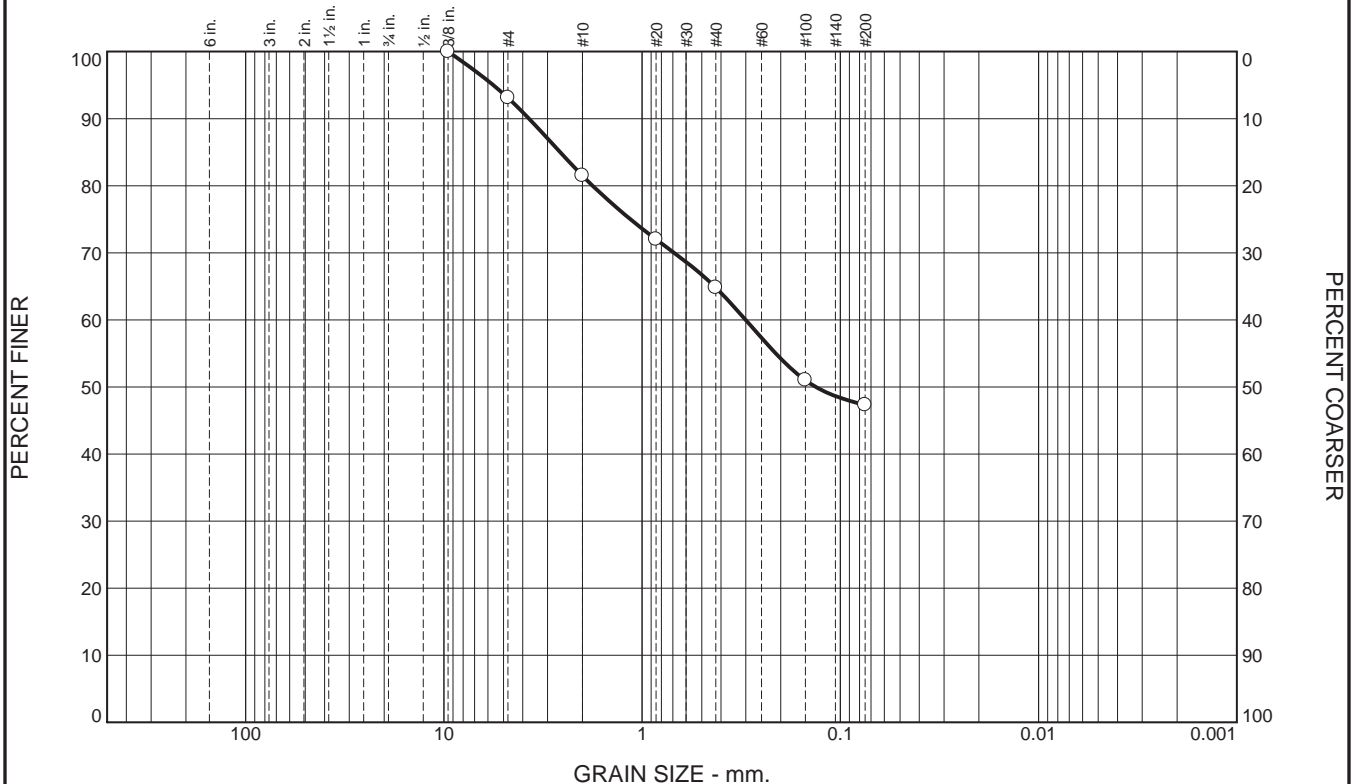
Date: 4/23/13

<h2 style="margin: 0;">Triad Engineering, Inc.</h2>	<p><b>Client:</b> URS Corporation</p> <p><b>Project:</b> City/County Landfill-Leachate Upgrades Washington County, Maryland</p> <p><b>Project No:</b> 03-11-0258</p>
<p><b>Figure</b>      C-2</p>	

Tested By: DLS



# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.9	11.6	16.7	17.5	47.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8	100.0		
#4	93.1		
#10	81.5		
#20	72.0		
#40	64.8		
#100	51.0		
#200	47.3		

**Soil Description**

Tan brown silty SAND, trace gravel.

**Atterberg Limits**

PL=                      LL=                      PI=

**Coefficients**

D<sub>85</sub>= 3.7199                      D<sub>85</sub>= 2.5900                      D<sub>60</sub>= 0.3004

D<sub>50</sub>= 0.1329                      D<sub>30</sub>=                      D<sub>15</sub>=

D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS=                      AASHTO=

**Remarks**

\* (no specification provided)

Source of Sample: Jar                      Depth: 8.5'-10.0'  
 Sample Number: B-2

Date: 4/23/13

**Triad Engineering, Inc.**

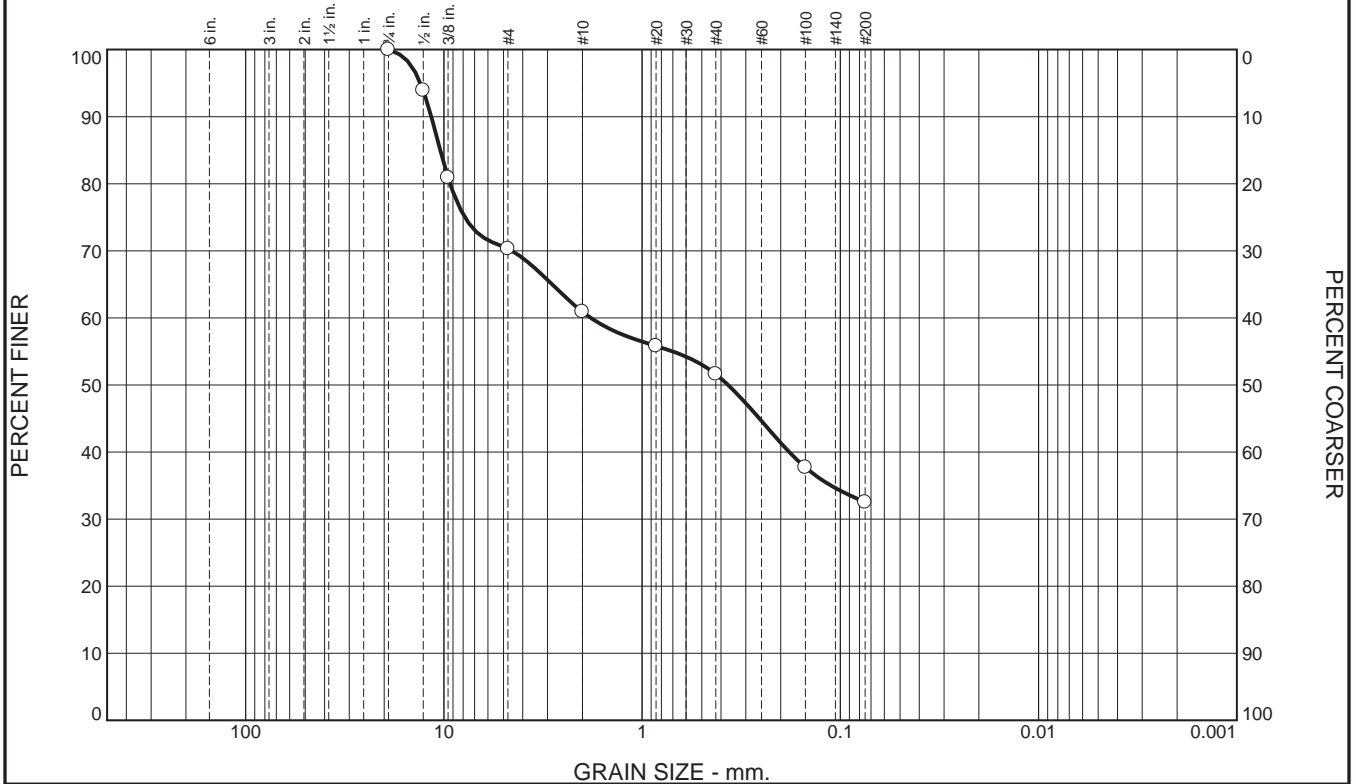
**Client:** URS Corporation  
**Project:** City/County Landfill-Leachate Upgrades  
 Washington County, Maryland

**Project No:** 03-11-0258

**Figure** C-3

Tested By: DLS

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	29.7	9.4	9.3	19.1	32.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
.5	93.9		
3/8	80.9		
#4	70.3		
#10	60.9		
#20	55.8		
#40	51.6		
#100	37.7		
#200	32.5		

**Soil Description**

Tan brown clayey SAND, some gravel.

**Atterberg Limits**

PL= 21      LL= 26      PI= 5

**Coefficients**

D<sub>90</sub>= 11.5727      D<sub>85</sub>= 10.4302      D<sub>60</sub>= 1.8164  
D<sub>50</sub>= 0.3683      D<sub>30</sub>=                      D<sub>15</sub>=  
D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Classification**

USCS= SC-SM      AASHTO= A-2-4(0)

**Remarks**

\* (no specification provided)

Source of Sample: Jar      Depth: 2.5'-6.5'  
Sample Number: B-4

Date: 4/23/13

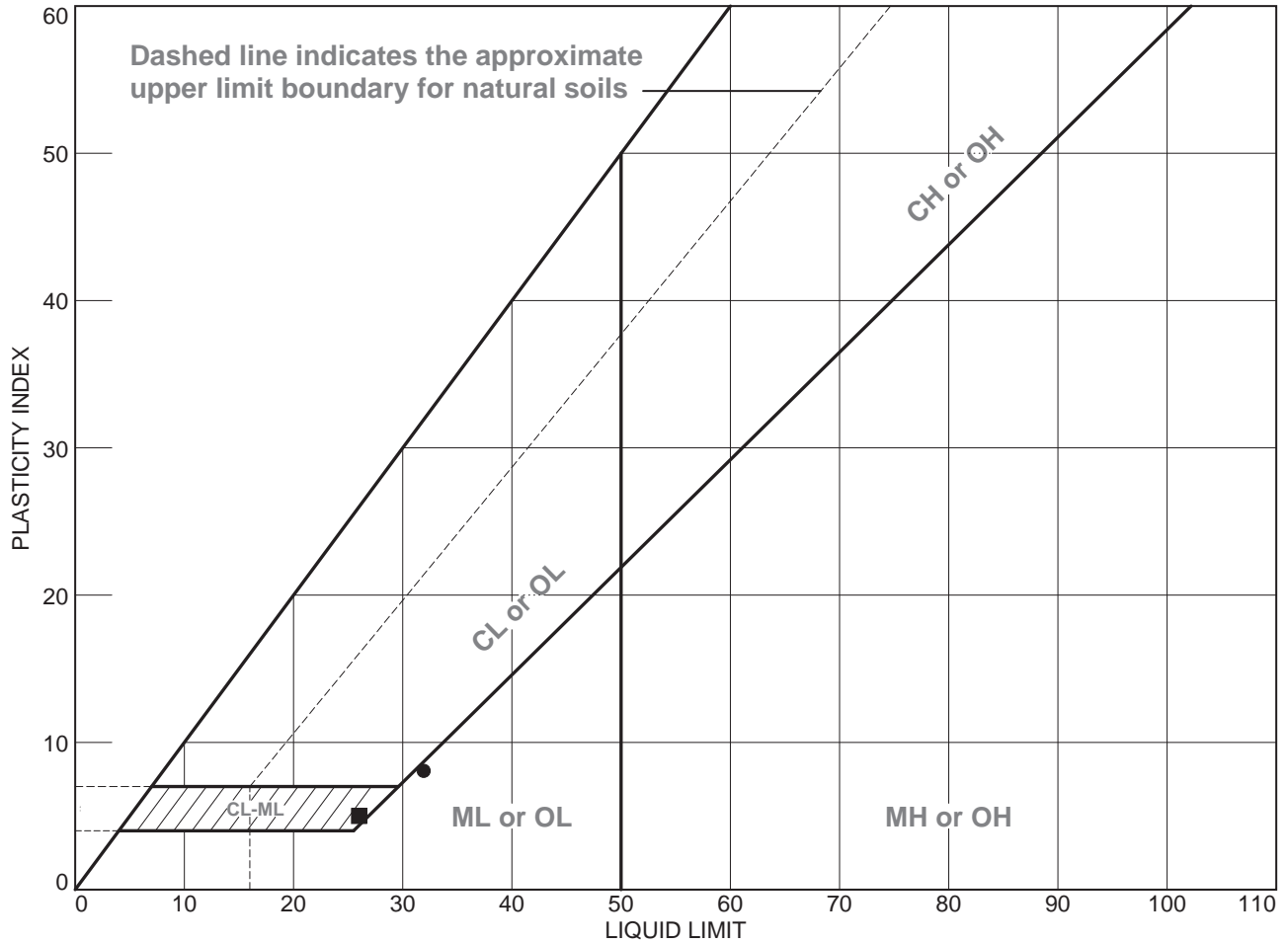
**Triad Engineering, Inc.**

**Client:** URS Corporation  
**Project:** City/County Landfill-Leachate Upgrades  
Washington County, Maryland  
**Project No:** 03-11-0258

**Figure** C-4

Tested By: DLS

# LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Jar	B-3	2.5'-4.0'	18.0	24	32	8	
■	Jar	B-4	2.5'-6.5'	13.2	21	26	5	SC-SM

**Triad Engineering, Inc.**

**Client:** URS Corporation  
**Project:** City/County Landfill-Leachate Upgrades  
 Washington County, Maryland  
**Project No.:** 03-11-0258

**Figure C-5**

Tested By: DLS

# **ATTACHMENT B**

**Construction Details for Gas Probes and Monitoring Wells  
Depth to Water Data (MW-1 through MW-5)  
(Environmental Alliance)**

Well I.D.	Well Permit #	Installation Date	Well Diameter (inches)	Total Depth of Well from Ground Surface	Elevation of TOC	Date of Last Survey	Depth to TOS from Ground Surface Elevation (feet)	Depth to BOS from Ground Surface Elevation (feet)
MW-1	WA-73-3207	09/11/80	4	124.20	568		115.00	124.20
MW-2	WA-73-3209	09/12/80	4	90.15	531		80.00	90.15
MW-3			4	101.00	510		91.00	101.00
MW-4			4	171.41	530		161.00	171.41
MW-5	WA-73-3242	09/13/80	4	115.60	555		107.00	115.60
GP-1	-	10/29/13	1	12.00	570		7.00	12.00
GP-2	-	10/29/13	1	14.00	550		9.00	14.00
GP-3	-	10/29/13	1	10.00	545		5.00	10.00
GP-4A	-	10/29/13	1	20.00	560		15.00	20.00
GP-4B	-	10/29/13	1	38.00	560		33.00	38.00
GP-5A	-	10/29/13	1	20.00	564		15.00	20.00
GP-5B	-	10/29/13	1	40.00	564		35.00	40.00

**Notes:**

- TOS - Top of screen
- TOC - Top of casing
- BOS - Bottom of screen

**Table 1**  
**Liquid Level Data**  
**City-County Landfill**  
**12824 Resh Road**  
**Hagerstown, Maryland**

Location ID	Top of Casing (feet)	Date	Depth to Water (feet)	Groundwater Surface Elevation (feet)
MW-1	568	Jan-15	23.30	544.70
		Feb-15	23.80	544.20
		Mar-15	22.60	545.40
		Apr-15	23.40	544.60
		May-15	23.00	545.00
		Jun-15	22.70	545.30
		Jul-15	23.10	544.90
		07/21/15	23.51	544.49
		Aug-15	24.80	543.20
		Sep-15	25.20	542.80
		Oct-15	25.40	542.60
		Nov-15	25.60	542.40
		Dec-15	25.40	542.60
		Jan-16		568.00
		Feb-16	25.90	542.10
		Mar-16	24.20	543.80
		Apr-16	24.50	543.50
		May-16	23.40	544.60
		Jun-16	24.30	543.70
		07/07/16	23.71	544.29
MW-2	531	Jan-15	32.50	498.50
		Feb-15	33.10	497.90
		Mar-15	32.30	498.70
		Apr-15	33.00	498.00
		May-15	32.60	498.40
		Jun-15	32.30	498.70
		Jul-15	33.00	498.00
		07/21/15	32.00	499.00
		Aug-15	25.00	506.00
		Sep-15	5.80	525.20
		Oct-15	36.30	494.70
		Nov-15	35.80	495.20
		Dec-15	34.90	496.10
		Jan-16		531.00
		Feb-16	35.60	495.40
		Mar-16	34.90	496.10
		Apr-16	35.40	495.60
		May-16	34.70	496.30
		Jun-16		
		07/07/16	32.44	498.56

**Table 1**  
**Liquid Level Data**  
**City-County Landfill**  
**12824 Resh Road**  
**Hagerstown, Maryland**

Location ID	Top of Casing (feet)	Date	Depth to Water (feet)	Groundwater Surface Elevation (feet)
MW-3R	510	Jan-15	44.80	465.20
		Feb-15	46.00	464.00
		Mar-15	44.80	465.20
		Apr-15	45.20	464.80
		May-15	44.70	465.30
		Jun-15	44.00	466.00
		Jul-15	44.80	465.20
		07/22/15	44.27	465.73
		Aug-15	45.50	464.50
		Sep-15	46.30	463.70
		Oct-15	46.80	463.20
		Nov-15	46.10	463.90
		Dec-15	45.20	464.80
		Jan-16		510.00
		Feb-16	46.30	463.70
		Mar-16	45.10	464.90
		Apr-16	45.60	464.40
		May-16	45.10	464.90
		Jun-16	47.00	463.00
		07/07/16	45.33	464.67

**Liquid Level Data  
City-County Landfill  
12824 Resh Road  
Hagerstown, Maryland**

Location ID	Top of Casing (feet)	Date	Depth to Water (feet)	Groundwater Surface Elevation (feet)
MW-4	530	Jan-15	construction	--
		Feb-15	--	--
		Mar-15	--	--
		Apr-15	--	--
		May-15	--	--
		Jun-15	60.30	469.70
		Jul-15	60.80	469.20
		07/22/15	61.39	468.61
		Aug-15	61.50	468.50
		Sep-15	91.70	438.30
		Oct-15	62.00	468.00
		Nov-15	61.60	468.40
		Dec-15	61.30	468.70
		Jan-16		530.00
		Feb-16	61.50	468.50
		Mar-16	60.80	469.20
		Apr-16	61.30	468.70
		May-16	60.40	469.60
		Jun-16	60.90	469.10
		07/07/16	61.83	468.17
MW-5	555	Jan-15	construction	--
		Feb-15	--	--
		Mar-15	--	--
		Apr-15	--	--
		May-15	--	--
		Jun-15	53.60	501.40
		Jul-15	55.10	499.90
		07/22/15	53.48	501.52
		Aug-15	56.60	498.40
		Sep-15	54.70	500.30
		Oct-15	57.10	497.90
		Nov-15	57.60	497.40
		Dec-15	56.90	498.10
		Jan-16		555.00
		Feb-16	57.40	497.60
		Mar-16	56.60	498.40
		Apr-16	57.00	498.00
		May-16	55.80	499.20
		Jun-16	57.10	497.90
		07/07/16	53.82	501.18

Notes:

--- = Not Applicable / Not Available

Shaded cells indicate readings collected by County personnel and provided to Alliance

Data collected prior to July 1, 2012, was provided by Maryland Environmental Service and has not been verified for accuracy.



**PUR-1360**  
**REVISED FORM OF PROPOSAL**  
**(Submit Form of Proposal & Schedule of Prices)**

**Board of County Commissioners  
of Washington County, Maryland  
(hereinafter called "Owner")  
c/o Washington County Purchasing Department  
100 West Washington Street, Room 3200  
Hagerstown, MD 21740**

**BIDS DUE:  
Date: Monday, December 4, 2017  
(Revised 11/16/17 via Addendum No. 2)  
Time: No later than 2:00 P.M. (EST)**

Project Name: **CITY/COUNTY LANDFILL GAS MITIGATION**  
Washington County Bid No.: **PUR-1360**  
Washington County Project No.: **20-150**

Proposal of \_\_\_\_\_ (hereinafter called "Bidder"), \*a corporation, organized and existing under the laws of the State of \_\_\_\_\_, \*a partnership, or an individual doing business as \_\_\_\_\_.

Telephone No. (\_\_\_\_) \_\_\_\_\_ Fax: (\_\_\_\_) \_\_\_\_\_

Contact: Name & Title Printed: \_\_\_\_\_

Address: \_\_\_\_\_

E-Mail Address: \_\_\_\_\_

\*Insert corporation, partnership or individual as applicable.

**Gentlemen/Ladies:**

The Bidder, in compliance with your Invitation for Bids for the abovementioned project has examined the plans and specifications with related documents and the size of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, equipment, plant and services, and to construct the project in accordance with the Contract Documents and Addenda within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part.

We hereby submit our proposal for the **CITY/COUNTY LANDFILL GAS MITIGATION**

Having carefully examined the Contract Documents for the subject construction project -

Specifications numbered \_\_\_\_\_

Drawings numbered \_\_\_\_\_

Addenda No. \_\_\_\_\_ Date \_\_\_\_\_; No. \_\_\_\_\_ Date \_\_\_\_\_; No. \_\_\_\_\_ Date \_\_\_\_\_;

No. \_\_\_\_\_ Date \_\_\_\_\_; No. \_\_\_\_\_ Date \_\_\_\_\_; No. \_\_\_\_\_ Date \_\_\_\_\_;

and having received clarification on all items of conflict or upon which any doubt arose, the undersigned proposes to properly complete the work, in strict accordance with the Contract Documents, for the stipulated sum of, based on the unit prices set forth in the attached Schedule of Prices:

*REVISED Form of Proposal (Revised 11/16/17 via Addendum No. 2)*

**PUR-1360**

**City/County Landfill Gas Mitigation**

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**1. TOTAL SUM BID:**

To furnish labor, materials, equipment, plant and services necessary to properly complete the work required under the TOTAL SUM BID, based on the unit prices set forth in the attached Schedule of Prices in strict accordance with the aforesaid documents, and to be substantially completed within **one hundred twenty (120) consecutive calendar days of Notice to Proceed.**

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_ )  
(Written) (Figures)

(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)

It is understood that the bid price will be firm for a time period of ninety (90) calendar days from the bid opening date and that if the undersigned is notified of acceptance of this proposal within this time period, the firm shall complete the total work within forty-five (45) consecutive calendar days from the date of "Notice to Proceed" for construction and to complete the work in accordance with the provisions of the Contract Documents. If this work is not completed within the time period specified, the Contractor will be liable for liquidated damages of five hundred (\$500.00) dollars per consecutive calendar day will be applied.

**2. SUBCONTRACTORS:**

- A. All Bidders shall submit their list of subcontractors list as part of their bid packet.
- B. No change or deviation from this list shall be allowed except as determined by the Owner or the Owner's Representative.

**3. AWARD:** Award of the bid can be made by the Owner to the responsive, responsible low bidder based on the Total Sum Bid plus Contingent Bid Item No. C1 through C-4.

**4. BIDDER'S STATE OF MARYLAND REGISTRATION NUMBER.**

Construction Firm License No.	Date Issued	Place of Issuance
Federal Employer Identification Number (FEIN) or Social Security No. if no FEIN		

Bid Security Bonds shall be submitted with each proposal in the amount of five percent (5%) of the Total of the Base Bid, plus Contingent Bid Item No. C-1 through C-4.

Bid Bonds, except those of the three (3) low bidders will be returned after the bid opening. Other bid bonds will be returned after the related contract has been executed. If no bid has been accepted within ninety (90) calendar days after the bid opening, then any bond may be returned upon demand of the bidder.

Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract within ten (10) calendar days. The Bid Security attached, in the sum of:

\_\_\_\_\_ (\$ \_\_\_\_\_),  
(Written) (Figures)

is to become the property of the Owner in the event the Contract and Bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

Failure to properly and completely fill in all blanks may be cause for rejection of this proposal. All alternates and unit prices called for in the Contract Documents must be submitted herewith.

AFFIRMATION/AFFIDAVIT REGARDING COLLUSION

I AFFIRM THAT:

Neither I nor, to the best of my knowledge, information, and belief, the below stated business has:

- (a) Agreed, conspired, connived, or colluded to produce a deceptive show of competition in the compilation of the accompanying bid or offer that is being submitted;
- (b) In any manner, directly or indirectly, entered into any agreement of any kind to fix the bid price or price proposal of the Bidder or Offeror or of any competitor, or otherwise taken any action in restraint of free competitive bidding in connection with the contract for which the accompanying bid or offer is submitted.

AFFIRMATION/AFFIDAVIT REGARDING BRIBERY CONVICTIONS

I FURTHER AFFIRM:

Neither I nor, to the best of my knowledge, information, and belief, the below business (as is defined in Section 16-101 (b) of the State Finance and Procurement Article of the Annotated Code of Maryland), or any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies (as is defined in Section 16-101(f) of the State Finance and Procurement Article of the Annotated Code of Maryland), has been convicted of, or has had probation before judgment imposed pursuant to Criminal Procedure Article, Section 6-220 of the Annotated Code of Maryland, or has pleaded nolo contendere to a charge of, bribery, attempted bribery, or conspiracy to bribe in violation of Maryland law, or of the law of any other State or federal law, except as follows (indicate the reasons why the affirmation cannot be given and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of person(s) involved, and their current positions and responsibilities with the business):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THE ABOVE-REFERENCED AFFIDAVITS ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF AND THAT I AM THE DULY AUTHORIZED REPRESENTATIVE OF THE BELOW BUSINESS AND THAT I PROCESS THE LEGAL AUTHORITY TO MAKE THE AFFIDAVITS ON BEHALF OF MYSELF AND THE BUSINESS FOR WHICH I AM ACTING.

BY: \_\_\_\_\_  
(Signature of Authorized Representative and Affiant)

\_\_\_\_\_  
(Name & Title Printed)

\_\_\_\_\_  
(Business Address)

\_\_\_\_\_/\_\_\_\_\_  
(Phone Number) (Fax Number)

\_\_\_\_\_  
(Federal Employer Identification Number)

(SEAL) If bid is by corporation.

*For Informational Purposes Only:* Has your company/firm been certified by the State of Maryland as a Minority Business Enterprise? (Please check below.)

\_\_\_\_\_ Yes                      \_\_\_\_\_ No

**PUR-1360**  
**REVISED SCHEDULE OF PRICES**  
**BASE BID**

ITEM NO.	ITEM (Unit Price Written)	UNIT	APPR. QTY	UNIT PRICE (Figures)	TOTAL PRICE (Figures)
1	Civil Works @ _____ Dollars (Written) _____ Cents <b>per</b> (Written)	LS	1	\$ _____	\$ _____
2	Erosion and Sediment Control @ _____ Dollars (Written) _____ Cents <b>per</b> (Written)	LS	1	\$ _____	\$ _____
3	Underground Utilities @ _____ Dollars (Written) _____ Cents <b>per</b> (Written)	LS	1	\$ _____	\$ _____

**PUR-1360**  
**REVISED SCHEDULE OF PRICES**  
**BASE BID**

ITEM NO.	ITEM (Unit Price Written)	UNIT	APPR. QTY	UNIT PRICE (Figures)	TOTAL PRICE (Figures)
4	Soil-Bentonite Barrier Wall @  _____ Dollars (Written)  _____ Cents per (Written)	VSF	47,000	\$ _____	\$ _____
5	Vertical Passive Vents @  _____ Dollars (Written)  _____ Cents per (Written)	EA	37	\$ _____	\$ _____
<b>Total Base Bid (Items 1 through 5)</b>					
				\$ _____	
_____ Dollars (Written)				(Figures)	
_____ Cents (Written)					

**PUR-1360**  
**REVISED SCHEDULE OF PRICES**  
**CONTINGENT BID ITEMS**

ITEM NO.	ITEM (Unit Price Written)	UNIT	APPR. QTY	UNIT PRICE (Figures)	TOTAL PRICE (Figures)
C-1	Contingent Unclassified Excavation @  _____ Dollars (Written)  _____ Cents <b>per</b> (Written)	CY	50	\$ _____	\$ _____
C-2	Contingent Excavation of Buries Waste and Transport to 40 West Landfill @  _____ Dollars (Written)  _____ Cents <b>per</b> (Written)	TON	50	\$ _____	\$ _____
C-3	Contingent General Soil Fill @  _____ Dollars (Written)  _____ Cents <b>per</b> (Written)	CY	50	\$ _____	\$ _____

**PUR-1360**  
**REVISED SCHEDULE OF PRICES**  
**CONTINGENT BID ITEMS**

ITEM NO.	ITEM (Unit Price Written)	UNIT	APPR. QTY	UNIT PRICE (Figures)	TOTAL PRICE (Figures)
C-4	Contingent Class I Riprap @  <div style="text-align: right;">_____ Dollars</div> <div style="text-align: center;">(Written)</div> <div style="text-align: right;">_____ Cents per</div> <div style="text-align: center;">(Written)</div>	CY	50	\$ _____	\$ _____
C-5	Bentonite  <div style="text-align: right;">_____ Dollars</div> <div style="text-align: center;">(Written)</div> <div style="text-align: right;">_____ Cents per</div> <div style="text-align: center;">(Written)</div>	TON	1	\$ _____	\$ _____
<b>Total Contingent Bid Items (Items C-1 through C-5)</b>					
				\$ _____	
_____ Dollars				(Figures)	
(Written)					
_____ Cents					
(Written)					



**PUR-1360**  
**REVISED SCHEDULE OF PRICES**  
**TOTAL SUM BID**

**Total Sum Bid for Base Bid Items 1 through 5**  
**Plus**  
**Contingent Items C-1 through C-5**

Dollars

(Written)

Cents

(Written)

\$ \_\_\_\_\_

(Figures)

**BID BOND**

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned \_\_\_\_\_ as Principal, and \_\_\_\_\_ as Surety, are hereby held and firmly bound unto the Board of County Commissioners of Washington County, Maryland as OWNER in the penal sum of \_\_\_\_\_ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this \_\_\_\_\_ day of \_\_\_\_\_, 2017. The Condition of the above obligation is such that whereas the Principal has submitted to the Board of County Commissioners of Washington County, Maryland a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for **Contract No. (PUR-1360) CITY/COUNTY LANDFILL GAS MITIGATION.**

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attachment hereto (Properly completed in accordance with said BID) and shall furnish a BOND for **faithful** performance of said contract, and for the payment of all persons performing labor furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

\_\_\_\_\_(L.S.)  
Principal

\_\_\_\_\_  
Surety

By:\_\_\_\_\_

**IMPORTANT** - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and authorized to transact business in the State where the project is located.

