May 19, 2017
GZA File No: 03.0033930.00

Commonwealth of Massachusetts
Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, Massachusetts 01887

Re: Utility-Related Abatement Measure (URAM) Status Report No. 9
UMASS Boston Campus UCRR Project
Boston, Massachusetts
RTN 3-31002

To Whom It May Concern:

On behalf of the University of Massachusetts Boston (UMASS Boston; the “Site”), GZA GeoEnvironmental, Inc. (GZA) has prepared this Utility-Related Abatement Measure (URAM) Status Report No. 9 for the UMASS Boston Utility Corridor and Roadway Replacement Project (UCRR). The URAM is being performed in compliance with the applicable requirements of Section 40.0460 of the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000).

A URAM Plan describing soil management procedures to be implemented during the UCRR was submitted to the Massachusetts Department of Environmental Protection (MassDEP) on June 24, 2013. URAM Status Reports 1 through 5, conducted under the provisions of the original URAM Plan, were submitted to MassDEP as work progressed. Modifications to the URAM Plan for this Site were necessitated by the detection of asbestos fibers in samples collected from excavated landfill material stockpiled at the site, as discussed in URAM Status Reports 6, 7, and 8. These subsequent URAM Status Reports described additional provisions to be taken to address the handling and management of excavated material, given the potential presence of asbestos fibers in the onsite landfill.

Soil excavated during the installation of utilities, related structures, and roadways for the UCRR project is managed under the protocols set forth in the following:

1. The original URAM Plan.
2. Additional soil management protocols provided in URAM Status Report Nos. 6, 7, and 8.
4. GZA’s understanding of the MassDEP’s expectations regarding excavated materials management protocols, based on correspondence with the MassDEP.

This URAM Status Report No. 9 discusses ongoing UCRR activities, including excavation, monitoring and control measures, installation and backfilling of utilities, installation of softscapes and hardscapes, installation of demarcation/barrier layer materials, and soil handling, management, off-site disposal, and reuse. A Locus Map is presented as Figure 1.
and the area covered under this URAM Plan is presented as Figure 2. The UCRR project is currently anticipated to be completed in mid-2018.

BACKGROUND

The project Site is approximately 95 acres in area and is occupied by a college campus consisting of multi-story buildings, a central former parking garage that forms a central plaza level, a former running track, a softball field, parking lots, and roadways. The UMASS Boston campus is located on the Columbia Point peninsula, which has a history of filling over the past 130 years. Originally, the Site was a tidal marshland, and approximately 60 acres of the southern and eastern campus area was submerged or tidal marsh. The UMASS Boston campus is constructed on filled marsh deposits, and the fill material used was largely municipal solid waste mixed with granular soil.

A manufactured gas plant (MGP) was in operation on what is now the western portion of the campus from the late 1880s to the 1930s. Beginning in the 1920s, the Site was used as a City of Boston burning dump; this activity more than doubled the size of the previously filled land that is now occupied by the campus. The landfill was closed in the early 1960s and the UMASS Boston campus was constructed in the early 1970s.

The complex land use history of the Site, combined with extensive regrading during the initial campus construction, has created a fairly homogeneous waste profile of fill extending to depths of as much as 30 feet below the existing ground surface. Oil and hazardous materials (OHM) detected in the fill include petroleum hydrocarbons, polychlorinated biphenyls (PCBs), metals, polycyclic aromatic hydrocarbons (PAHs), and methane. In some cases, the reported OHM concentrations have exceeded Reportable Concentrations specified in the MCP.

The UMASS Boston campus was granted a Special Project Designation (SPD) under the MCP by the MassDEP in 2012. All projects on campus which involve earthwork or ground-disturbing construction are managed under the MCP and require oversight by a Licensed Site Professional (LSP). The master release tracking number (RTN) for the UMASS Boston campus is 3-31000. Under the terms of the SPD, each construction project site on campus at which MCP-regulated materials may be encountered, excavated, disturbed, or relocated is assigned a unique “daughter” RTN. The UCRR project is being conducted under RTN 3-31002 and the work is overseen by the MassDEP Bureau of Waste Site Cleanup.

UTILITY CORRIDOR AND ROADWAY RELOCATION (UCRR) PROJECT

The UCRR project is a massive and essential enabling project for the UMASS campus. In 2009, a new Campus Master Plan was adopted that provided the framework for campus development for the subsequent twenty-five years. When the campus was originally constructed, primary campus utilities were routed through a central Substructure located below the original campus buildings. The 40-year-old Substructure is now failing, and the Campus Master Plan calls for the creation of a central quadrangle on campus to replace the failing Substructure. To provide a better understanding of the campus’ needs related to the demolition of the Substructure, a Utilities Master Plan was prepared by Arup USA Inc. to consider options for rerouting the utilities necessitated by the demolition of the Substructure. The Utilities Master Plan also reviewed current utility loads and conditions, evaluated possible alternative sources of energy for the campus, and forecasted future utility loads based upon the anticipated full development build-out envisioned in the Campus Master Plan.

Based upon the Utilities Master Plan, a decision was made to provide a campus-wide perimeter utility corridor. The UCRR project construction started in 2012 with upgrades to the existing Campus Utility Plant. Construction has continued on the primary utility loop and includes a new two-way roadway system with 11-foot lanes, five-foot bike lanes, eight-foot tree lawns and eight-foot sidewalks throughout most of the campus. In addition, more than 600 new trees are planned to be planted on campus.
The new roadway and pedestrian system will improve overall traffic circulation and pedestrian connections on campus. The new utility corridor, incorporating more than 17 miles of new piping and duct banks, will support future buildings and provide reliable and redundant utility services to the campus. The new utilities being installed include piping for domestic and fire water, sanitary wastewater, chilled water, heating hot water, and natural gas, as well as conduits for electrical, telecommunications, and data lines. A storm water management plan is also part of this project, and will make extensive use of sustainable bio-retention swales to manage storm water run-off.

Unlike individual building projects on the campus which have a well-defined areal footprint, the UCRR project is linear and extends over much of the campus area (refer to Figure 2 for utility corridor alignment). It is estimated that over the course of the entire project approximately 300,000 cubic yards of soil and landfill material will be handled (excavated, potentially processed, stockpiled, reused to construct landforms and changes in grade, potentially reused as utility trench backfill, or disposed of off-Site).

URAM STATUS REPORT 9 INFORMATION

This URAM Status Report addresses the period from November 1, 2016, through April 30, 2017, and provides information required in accordance with 310 CMR 40.0465(2).

STATUS OF UCRR CONSTRUCTION ACTIVITIES

During this period, work was conducted at several locations (refer to Figures 3 and 4 for details). Generally, the work consisted of excavating landfill material, imported landfill cover (granular fill), and asphalt; segregating and stockpiling the excavated materials; placing excavated landfill as new fill for landforms; installing utilities; placing existing excavated/stockpiled granular fill and landfill cover below the demarcation/barrier layer levels; installing the barrier and demarcation layers; and placing imported material above the barrier and demarcation layers. Work performed in this time period was observed to be generally consistent with the intent of the protocols outlined in the original June 24, 2013, URAM Plan, and the modifications and additional provisions to the URAM Plan discussed in URAM Status Reports 6, 7, and 8.

- Material excavated for the installation of utilities and other site improvements has generally consisted of surficial asphalt, concrete/rubble, landfill cover material (granular fill or sand and gravel), and landfill material. These materials were excavated, segregated, and stockpiled with stockpiles of like material in the former Track area or Lot A.
  - The surficial asphalt was “peeled up” using an excavator and has been and will be disposed of off-site as ACWM.
  - Existing landfill cover is a granular fill material and was excavated and reused as trench backfill below the demarcation/barrier layer at various locations within the work zones, or was stockpiled at the former Track Area for future reuse.
  - Excavated landfill material was culled of oversized material using the excavator bucket, and reused as new fill for the landform in the former Track Area. Excavated landfill was also stockpiled in the former Track Area for potential off-site disposal as ACWM. The oversized material that was culled from the landfill was stockpiled in Lot A with like material consisting of oversized concrete and rubble.

- University Drive North (northwest of the Calf Pasture Pump Station (CPPS), southwest of the Archives Building, south of the EMKi Building, and northwest of the General Academic Building 1 (GAB1)):
Utilities: The contractor excavated landfill material and existing landfill cover, and these materials were managed as described above. Several utilities were installed in the excavated trenches including electrical and communications duct banks, domestic water and fire protection lines, thermal lines, sanitation sewer lines and structures, storm drain lines and structures, and light pole bases. Landfill material excavated from the utility trenches was culled of oversized materials and debris, and stockpiled at the former Track area to either be reused as fill for the Track Area Landform or disposed of off-site as ACWM. The excavations and utility trenches were backfilled with on-site granular fill below the demarcation/barrier layer elevation.

Site Work: The contractor cut, placed fill and backfill, and graded to the demarcation layer subgrade; installed the demarcation layer; and placed imported road base (landfill cover material) and asphalt over the demarcation layer, as shown on Figure 4.

University Drive West (west/northwest of Clark Athletic Center, west of the Integrated Science Complex (ISC)):

Utilities: The contractor excavated landfill material and existing landfill cover, and these materials were managed as described above. Several utilities were installed in the excavated trenches including electrical and communications duct banks, domestic water and fire protection lines and fire hydrants, thermal lines, storm drain lines and structures, sanitation sewer lines and structures, and light pole bases.

Site Work: The contractor cut, placed fill and backfill, and graded to the demarcation layer subgrade; installed the demarcation layer; and placed imported road base (landfill cover material) and asphalt over the demarcation layer, as shown on Figure 4.

In the work zones west of the Clark Athletic Center, a wheel wash station could not be constructed due to space constraints. Instead, a clean driving surface was maintained such that vehicles exiting the area did not track potentially contaminated soil onto public roadways.

North of Service and Supply (S&S) Building:

Utilities: The contractor excavated landfill material, granular fill, and existing landfill cover, and these materials were managed as described above. Several utilities were installed in the excavated trenches including domestic water and fire protection lines, electric and communications duct banks, and thermal lines.

Site Work: The contractor demolished an existing brick and mortar foundation wall possibly associated with the former manufactured gas plant at this location. The wall was demolished using an excavator fitted with a hoe ram, and oversized particles were downsize using a hoe ram and mixed with the surrounding soil (silty sand and gravel) for reuse in the former Track Area landform or for disposal off-site as ACWM. The material was stockpiled at the former Track Area. The contractor wetted the material prior to and during the operation. The hoe ramming / chipping occurred at clean points on pieces of concrete when possible. Dust control and air monitoring per the URAM/NT Plan were in place during chipping/break-down; GZA did not observe visible dust during the demolition operation, and GZA's and EH&E's dust and asbestos monitoring did not indicate any exceedances of threshold limits.

Vehicles exiting the area were confined to traversing a clean asphalt or imported soil driving surface, so that potentially contaminated soil was not tracked onto public roadways. GZA had previously sampled and performed analytical testing of the concrete pavement base course that was exposed at the ground
surface; the testing frequency and selection of analytes were in accordance with the URAM Status Report No. 7 and MassDEP’s Conditional Approval Letter of Status Report No 7, for material intended to be reused as clean cover above the demarcation/barrier layer. The material was found to be non-detect for asbestos and to contain levels of metals and SVOCs that do not present a significant risk to human health. The existing in-place base course material was therefore deemed acceptable for use as a clean driving surface. As noted above, other portions of the clean driving surface consisted of asphalt and imported soil.

- University Drive South (south and east of Wheatley Hall, between Wheatley & McCormack Halls, west of McCormack Hall, Harbor-Walk, and south of the Bianculli Roundabout)
  - Utilities: The contractor excavated landfill material, granular fill, and existing landfill cover, and these materials were managed as described above. Several utilities were installed in the excavated trenches including electrical and communications duct banks, blue emergency phone conduits, domestic water and fire protection lines, storm drain lines and structures, thermal lines, and site lighting conduit and light pole bases.
  - Site Work:
    - The contractor excavated and graded existing landfill material, installed the barrier layer as shown in Figure 4, and placed imported soil above the barrier layer, for construction of landscaped areas.
    - The contractor excavated and graded existing landfill material, installed the barrier layer as described in Figure 4 and in the Additional Provisions section of this report, and placed imported soil above the barrier layer, for construction of three bioretention ponds.
    - The contractor cut, placed fill and backfill, and graded to the demarcation layer subgrade; installed the demarcation layer; and placed imported road and walkway base course (landfill cover material), as shown on Figure 4.
    - The contractor graded to the demarcation layer subgrade, installed the demarcation geotextile as described in Figure 4 and in the Additional Provisions section of URAM Status Report Number 8, and tree lawns over the demarcation layer.
    - The contractor graded to the demarcation layer subgrade, installed the demarcation geotextile as described in Figure 4 and in the Additional Provision section of this report, and constructed granite stone revetment retaining walls over the demarcation layer.
    - South of University Drive South, the contractor demolished an existing exterior concrete stairway to the west of the existing pump house; refer to Figure 3. The exterior concrete staircase was demolished using excavators fitted with a hoe ram and hydraulic jaws. The concrete was stockpiled at Lot A, with similar concrete/rubble. Hydraulic jaws were used as needed to break up the concrete pieces, to remove reinforcing steel, and to downsize the oversized particles for later disposal off-site as ACWM. The contractor wetted the surfaces of the concrete prior to and during the operation. The hoe ramming/chipping occurred at clean points on pieces of concrete when possible. Dust control and air monitoring per URAM/NT Plan were in place during chipping/break-down. GZA’s and EH&E’s dust and asbestos monitoring did not indicate any exceedances of threshold limits.
• Bianculli Boulevard:
  
  o Site Work:
    ▪ The contractor installed granite curbing for the new roadway.

• University Drive East (east of the Campus Center, east of General Academic Building 1 (GAB1), and east of Wheatley:
  
  o Utilities: The contractor excavated landfill material, granular fill, and existing landfill cover, and these materials were managed as described above. Several utilities were installed in the excavated trenches including fire protection lines and fire hydrants, storm drain lines and structures, site lighting conduit, and light pole bases.

  o Site Work:
    ▪ The contractor excavated and graded existing landfill material, installed the barrier layer as shown in Figure 4, and placed imported soil above the barrier layer for construction of the Lot S landform.
    
    ▪ The contractor cut, placed fill and backfill, and graded to the demarcation layer subgrade; installed the demarcation layer; placed imported road base course (landfill cover material); and placed asphalt for the roadway to the east of Wheatley (Wheatley Drive), as shown on Figure 4.

    ▪ The contractor installed granite curbing for the new roadway.

• Track Landform: Continuing in April, excavated landfill material was culled of oversized materials and debris, and reused onsite as fill for the Track area landform; refer to Figure 3. Excavated and culled landfill material has also been stockpiled at the former Track area for future disposal as ACWM. None of the geotextile barrier layer has been placed to date, for the Track area landform.

• Lot S Landform: Approximately 30 to 40% of the geotextile barrier layer (RS380i) and imported cover material have been installed within the limits of the Lot S landform. Refer to Figure 3 for the area of fill placement below the barrier layer to construct the landform. Refer to Figure 4 for the area of area of barrier layer and imported cover material placement. An approximately 10,000-cubic yard stockpile of on-site sand and gravel was previously stockpiled in the northwestern portion of the Lot S landform area. Following the reuse of this sand and gravel material as trench backfill below the demarcation/barrier layer, the culled landfill that is stockpiled on the southern portion of Lot S will be spread in the northwestern area of the landform as new fill. This will be documented in subsequent URAM Status Reports.

• During the period covered by this URAM Status Report, EH&E performed monitoring for asbestos fibers in air, wheel wash stations were maintained and operated, water sources were identified and used for immediate wetting of excavated material at each work zone, perimeter fencing was adjusted as needed to restrict public access to work zones, and clean travel pathways were constructed and maintained with imported material. On limited occasions and when the size of the work zone did not accommodate a wheel wash, clean travel pathways were constructed with imported material and maintained with additional imported material and by the use of polyethylene sheeting to prevent spillage of material onto clean driving surfaces. Refer to Figure 3 for locations of environmental controls relative to the location of work zones. The intent of this Figure is to illustrate that for each work zone and construction activity, environmental controls are in place to reduce the risk of the public’s exposure to potentially contaminated materials.
Throughout the duration of this reporting period, stockpiles have been maintained and dust control agents have been applied to stockpiles. In general, the excavated soil materials that were not reused as fill for landforms or backfill for trenches (below the demarcation/barrier layer) were stockpiled at the former Track area. Concrete and oversized rubble that was culled from the landfill material was stockpiled at Lot A.

**RECENT ADDITIONAL DATA**

Due to the discovery of asbestos fibers in Site soil, excavated soil and waste materials may not be mechanically processed or screened for re-use unless the material is demonstrated to not contain asbestos and to have contaminant (CAM-14 metals and SVOC) levels that do not present a significant risk to human health, or unless such activities are conducted in a suitable enclosure designed to protect these operations from wind and precipitation that could result in fugitive dust and erosion. This prohibition has resulted in a decrease in the amount of material that can practicably be processed for re-use, and a corresponding increase in the volume of material requiring off-Site disposal. It is estimated that an additional 50,000 cubic yards of material will require off-site disposal.

Recent additional data collected during the current URAM Status Report period includes disposal and reuse characterization data for a variety of materials (both stockpiled material and in-situ material) and air monitoring data during excavation activities, as described below.

As needed for off-site disposal, 78 soil samples were submitted to ESS Laboratories, Inc. of Cranston, Rhode Island for disposal pre-characterization analyses (pH, conductivity, reactivity, total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, herbicides, and RCRA 8 TCLP metals). All the materials were assumed to be asbestos containing waste material (ACWM). The following describes the sampling and testing events.

**October 2016 Landfill Material Stockpile Characterization Sampling and Analysis**

In October 2016, GZA collected samples for disposal characterization analysis from three stockpiles located at the former Track. The stockpile locations, sample locations, and analytical results are provided in Attachment 1. The following stockpile samples were collected:

- 15 samples, designated SLFT-1 through SLFT-15, from a stockpile of screened landfill material (i.e., landfill that had been processed using a mechanized screening machine to remove oversized particles, prior to the discovery of asbestos fibers in landfill material);
- 1 sample from a stockpile of landfill material, designated LT-1; and
- 11 samples, designated TLFT-1 through TLFT-11, from a stockpile of processed landfill tailings material. The processed landfill tailings consisted of the oversized portions of the screening process (i.e., the portions retained on the screen), which had then been downsized. This processing was performed prior to the discovery of asbestos fibers in landfill material.

The analytical results indicated TCLP-lead exceedances in sample SLFT-3. The material which this sample represented, and the material of the adjacent stockpile cells, was reused below the barrier layer level within the former Track area landform, within the Area of Contamination (AOC), rather than being disposed of off-site. As defined in the URAM Plan, the AOC for RTN 3-31002 encompasses the majority of the Campus area, since the Columbia Point peninsula is comprised primarily of historically landfilled materials; the AOC is defined in further detail in Figure 2. Since TCLP-lead soils were
anticipated to be encountered during construction, and since the on-site reuse of these soils beneath clean cover material was specified in the URAM Plan and subsequent status reports, the stockpiled TCLP-lead soils have been incorporated into the Track area landform below the barrier layer level.

**November 2016 Asphalt Stockpile Characterization Sampling and Analysis**

In November 2016, GZA collected samples, designated AS-4 and AS-5, for disposal characterization analysis from two stockpiles located at the former Track. The stockpiles consisted of asphalt that had been excavated or “peeled” up from the road base. The stockpile locations, sample locations, and analytical results are provided in Attachment 2.

**February 2017 Landfill Material Stockpile Characterization Sampling and Analysis**

In February 2017, GZA collected samples, designated LFT-C/G-15 through LFT-C/G-50, for disposal characterization analysis from two stockpiles of excavated landfill material located at the former Track. The stockpile locations, sample locations, and analytical results are provided in Attachment 3.

**March 2017 Uncrushed Concrete Stockpile Characterization Sampling and Analysis**

In March 2017, GZA collected two samples, designated UC-16 and UC-17, from a stockpile of uncrushed concrete at Lot A, for disposal characterization analysis. The stockpile location, sample locations, and analytical results are provided in Attachment 4.

**April 2017 Landfill Material Stockpile Characterization Sampling and Analysis**

In April 2017, GZA collected samples, designated LFT-C/G-51 through LFT-C/G-61, for disposal characterization analysis from a stockpile of excavated landfill material located at the former Track. The stockpile location, sample locations, and analytical results are provided in Attachment 5.

**September through December 2016 In-situ Precharacterization for Pavement Reclaiming**

Due to the presence of asbestos fibers in some site soils, on-site soil and waste materials may not be mechanically processed for re-use unless the material has been demonstrated to not contain asbestos and to have contaminant (CAM-14 metals and SVOC) levels that do not present a significant risk to human health, as stipulated in URAM Status Report 7 and MassDEP’s Conditional Approval Letter of URAM Status Report 7. The purpose of the pavement sampling and testing program was to precharacterize the existing pavement in certain portions of the UMASS campus, including the existing asphalt and aggregate base course, down to a depth of about 1.5 feet or to the bottom of the aggregate base course, whichever is shallower. The goal was to evaluate whether the materials could be reclaimed and reused above the demarcation layer as a new aggregate base course beneath new asphalt. The process of reclaiming consists of the in-place mechanical pulverizing and mixing of the asphalt and base course, which is then removed down to a depth of up to 1.5 feet.

One hundred sixty-six samples were obtained from geoprobe borings. Each sample consisted of a proportional composite of asphalt and underlying base course, and was tested for asbestos fibers, CAM-14 metals, and SVOCs. This included asbestos testing at a frequency of one sample per 100 cubic yards (c.y.) of material and testing for CAM-14 metals and SVOCs at a frequency of one sample per 250 c.y. The boring location plan, boring logs and analytical results are included in Attachment 6.

The criteria for material reuse for this purpose includes: 1) the material shall not contain asbestos fibers, and 2) the levels of CAM-14 metals and SVOCs will not present a significant risk to UMass Boston students, faculty, staff, and visitors. Based
on the presence or absence of asbestos fibers in the soil samples, Figure 1 of Attachment 6 provides zones and corresponding depths to which asbestos is or is not present. In areas where asbestos was detected in roadbed material, this material will be excavated, “peeled” up, or otherwise removed by methods other than reclaiming, and then segregated and stockpiled for reuse below the demarcation/barrier layer or for off-site disposal. In the larger areas where asbestos fibers were not encountered in samples and the levels of CAM-14 metals and SVOCs will not present a significant health risk, the existing asphalt and aggregate base course/landfill cover will be reclaimed for on-site reuse as aggregate base course beneath new asphalt, down to the sample depths indicated on Figure 1 of Attachment 6. The environmental controls, monitoring, and other requirements described in the URAM Plan and subsequent status reports, as well as the requirements of the Excavated Materials Management Specification, Section 312001, revised June 15, 2016, will be adhered to.

December 2016 In-situ Precharacterization for Temporary Roadway Realignment

As indicated above, onsite materials may not be mechanically processed, reused above the demarcation/barrier layer, or otherwise handled as a clean or non-ACWM unless asbestos fibers are not encountered and the levels of CAM-14 metals and SVOCs will not present a significant health risk. The environmental controls, monitoring, and other requirements presented in the URAM Plan, subsequent status reports, and the Excavated Materials Management Specification are predicated on the assumption that the on-site material is contaminated and will be handled and treated as contaminated material, unless analytical testing shows otherwise. The purpose of this sampling and analytical program was to precharacterize the existing landfill cover (asphalt/topsoil and existing landfill cover) within the proposed new temporary alignment of University Drive West (UDW) to assess whether the surficial materials could be handled and treated as non-asbestos-contaminated material (i.e., without the need for a wheel wash and other precautions taken specifically to address asbestos contamination).

Eleven geoprobe samples, designated U-668-TR through U-678-TR, were obtained and tested for this study. Geoprobe borings were advanced up to 4 feet below current grades through existing pavement and landscaped areas. Proportionally composite samples of the asphalt/topsoil and existing landfill cover were obtained and tested for asbestos, CAM-14 metals, and SVOCs. In addition, six relevantly-located samples from the Pavement Precharacterization Study were used to supplement this study. The boring location plan, boring logs and analytical results are included in Attachment 7.

Six of the 11 samples obtained and tested for this study either: 1) contained asbestos fibers, 2) contained elevated levels of SVOCs that were not due to the presence of asphalt, and/or 3) contained elevated levels of lead. At three locations, the landfill material was encountered within 0.6 feet of the ground surface. Based on these results, work within this area and work for the temporary University Drive West realignment adhered to the environmental controls, monitoring, and other requirements presented in the URAM Plan, subsequent status reports, and the Excavated Materials Management Specification.

OFF-SITE DISPOSAL OF ON-SITE MATERIALS

Disposal of Onsite Characterized and Stockpiled Material

On August 28, 2016, Boston Environmental Corporation submitted an application to Waste Management (WM) for the disposal of up to 34,830 cubic yards of asbestos-contaminated soil (ACWM) at WM’s Turnkey Landfill in Rochester, New Hampshire, or the Crossroads Landfill in Norridgewock, Maine. The disposal characterization data described above was included in the package. WM approved the application on September 1, 2016. Since September 2016, BEC has submitted five (5) amendment requests to WM. The combined original application and sum of amendments total approximately 90,000 to 97,000 tons of material, or about 57,000 to 60,000 cubic yards, which has been approved by WM for off-site disposal at the Crossroads Landfill in Norridgewock, Maine.
Derenzo loaded trucks with onsite material for off-site disposal at the Crossroads Landfill facility (Crossroads) in Norridgewock, Maine. Trucks were loaded with onsite loam, concrete, landfill, and other materials approved for disposal from stockpiles located at the former Track area and Lot A. Perimeter air monitoring was in-place during loading operations; refer to EH&E’s reports which include Phase Contrast Microscopy (PCM) laboratory analytical results for air samples obtained during the loading operations. Truck beds were double-lined prior to loading. Following loading, each truck was decontaminated at a wheel wash prior to exiting the site onto public roadways. From November 1, 2016 through April 30, 2017, approximately 54,500 tons (approx. 33,700 cubic yards) of material has been transported off-Site; this corresponds to a total of about 62,000 tons (approximately 39,000 cubic yards) of onsite material disposed of to date. Completed forms that have been received from Crossroads will be included in a URAM Status Report or URAM Completion Report, following close-out of the Bill of Lading for this material.

ENVIRONMENTAL CONTROLS AND COMPLIANCE

Air Monitoring by GZA

While onsite, GZA monitors for dust, VOCs, and combustible gasses along the perimeter of the work limits and within GZA’s “breathing zone” using a Thermo MIE pDR-1000 DataRam Dust Monitor (total dust meter), three Thermo Scientific MIE pDR-1500 (PM10 dust meters), a MiniRae3000 Organic Vapor Meter, and two MultiRae Model PGM-6228 5-Gas Monitors. No total dust readings recorded on the Dust Monitors exceeded the thresholds presented in GZA’s Health and Safety Plan (HASP). Other than noted below, no maximum PM10 dust readings exceeded 150 µg/m³. No readings above background levels were detected by the 5-Gas Monitor. No air monitoring readings or OVM reading exceeded the action levels, as indicated in GZA’s HASP for the “breathing zone” or in the Excavated Materials Management Specification.

At about 10:30 AM on 11/22/2016, GZA measured a PM10 dust exceedance between University Drive North and Mt. Vernon Street. The measured PM10 dust level was about 0.170 mg/m³, and the threshold is 0.150 mg/m³. This area consisted of an asphalt-paved public road which had previously been a work zone. While this area was a work zone, onsite soil spilled onto the existing asphalt. Once utilities were installed, the asphalt was patched and the spilled soil was removed from the existing asphalt that remained. The dust may have consisted of general road grit, or of fine-grained Site soils that remained in the voids of the rough-textured asphalt surface. Regardless, the area of road where dust was generated was wetted down immediately. PM10 dust measurements following this low-level exceedance quickly dropped to less than about 0.010 mg/m³, indicating that wetting the road was effective at reducing the potential for dust generation.

Observations of Visible Dust

The follow describes instances when GZA observed visible dust. In each instance, the contractor halted work, and took corrective action to suppress dust and mitigate the potential for additional dust, prior to resuming work. MassDEP was notified of each instance.

- On 12/27/2017, while the Contractor was loading trucks from a stockpile of loam on Lot A for disposal at Crossroads in Maine, GZA observed a small amount of visible dust. The contractor had been wetting the material prior to and during the observation of visible dust, and immediately took additional corrective action by applying more water to the material prior to resuming work. The plume of visible dust did not extend further than about 10 to 15 feet from the source (a loader) and was contained within the work zone, and GZA’s and EH&E’s dust and asbestos monitoring did not show any exceedances.
• On 1/16/2017, GZA observed visible dust at two work zones of the UMASS UCRR project.
  
  o The Contractor was moisture-conditioning and reshaping the stockpiles in the Track. GZA observed a small amount of visible dust during this operation. The contractor had been wetting the material prior to and during the observation of visible dust, and immediately stopped work and took additional corrective action by applying more water to the material prior to resuming work. The plume of visible dust did not extend further than about 10 feet from the source (a loader) and was contained within the work zone, and GZA’s and EH&E’s dust and asbestos monitoring did not show any exceedances.

  o During demolition/hoe-ramming of the concrete stairway that is adjacent to the Pump Station and Harbor Walk, GZA observed visible dust. Derenzo had wetted the surface of the concrete prior to and during the operation. Upon the observance of dust, Derenzo stopped work and immediately took additional corrective action by applying more water to the concrete. It should be noted that the observed dust appeared to be generated by the breaking/hoe-ramming of the concrete during demolition, and did not involve potentially asbestos-containing soil; the soil beneath the concrete appeared to be moist, and was not observed to generate dust. The visible concrete dust was contained within the work zone, and GZA’s and EH&E’s dust and asbestos monitoring did not show any exceedances.

• On 2/6/2017 and 2/23/17, GZA observed visible dust being generated within a fenced-in work zone by construction (vehicular) traffic along University Drive South. During the day, the contractor routinely sprays water on the road surface using a water truck. Following the observation of dust, the contractor immediately stopped work and took additional corrective action by applying more water to the roadway surface prior to resuming construction traffic. In both cases the plume of visible dust did not extend further than about 10 to 20 feet from the roadway and was contained within the work zone, and GZA’s dust monitoring did not show any exceedances.

• On 2/28/2017, GZA observed visible dust being generated within a fenced-in work zone by construction (vehicular) traffic within the former track area. During the day, the contractor routinely sprays water on the road surface using a water truck. Following the observation of dust, the contractor immediately halted construction traffic and took additional corrective action by applying more water to the roadway surface prior to resuming construction traffic. GZA observed that the majority of the plume of visible dust did not extend further than about 10 to 20 feet from the construction roadway. GZA’s dust monitoring did not show any exceedances.

• On 3/2/2017, the weather conditions at UMASS Boston included sustained winds of 20 to 30 mph, with gusts of up to about 50 mph (reference: National Weather Service). As a result of these extraordinary weather conditions, GZA observed visible dust throughout the Campus. Although the dust did not appear to be generated by specific construction activities, JDC continually wetted both work areas and road surfaces by water truck and fire hydrants in an effort to suppress dust as much as possible.

• On 3/3/2017, GZA observed visible dust being generated within a fenced-in work zone by a combination of sustained winds and construction (vehicular) traffic within the former track area. During the day, the contractor routinely sprays water on the road surface using a water truck. Following the observation of dust, the contractor immediately halted construction traffic and took additional corrective action by applying more water to the
roadway surface prior to resuming construction traffic. GZA observed that the majority of the plume of visible dust did not extend further than about 20 feet from the construction roadway.

Air Monitoring by EH&E

During the period of this Status Report, Environmental Health and Engineering (EH&E) has been on site monitoring/sampling air around excavation and work areas for asbestos fibers in accordance with EH&E’s MassDEP-approved Perimeter Asbestos Air Monitoring Plan, provided as Attachment 1 to URAM Status Report No. 7. The perimeter air monitoring for asbestos was performed to assess the adequacy of dust control measures at minimizing the potential for airborne asbestos fibers, and to ensure that if elevated levels were detected corrective actions would be implemented to effectively control potential sources. Each day, two sets of samples (morning and afternoon) were collected at four (4) monitoring stations around the perimeter of each work activity involving potentially asbestos contaminated soils. Duplicate and blank samples were also collected daily for quality control (QC) purposes.

Results through October 31, 2016, are summarized in the previous URAM Status report. From November 1, 2016, through April 30, 2017, over 6,000 perimeter air samples (not including quality assurance samples) were collected around work areas when potentially asbestos-contaminated soils were being disturbed. The samples were analyzed for total airborne fibers, including but not specific to asbestos, using Phase Contrast Microscopy (PCM). All results during this time period have been below the MassDEP specified action level of 0.010 fibers per cubic centimeter (f/cc).

All PCM measurements have also been at least an order of magnitude below health-based occupational exposure limits for asbestos, including the U.S. Occupational Safety and Health Administration (OSHA) permissible exposure limit of 0.1 f/cc. PCM results have been provided to the MassDEP on a daily basis in accordance with the Plan. Overall, perimeter air monitoring results to date do not indicate any evidence of elevated emissions from UCRR Project work areas. The analytical results of the monitoring and reports by EH&E are included in Attachment 8.

Construction Observation, Environmental Controls, and Compliance

Throughout the period of this URAM Status Report, GZA made visual observations of the excavated material, and made recommendations for excavated material management and reuse. The environmental consultants (GZA and EH&E) and contractors (Bond and Derenzo) attend daily meetings to discuss the following day’s scheduled activities. This allows the environmental consultants to stay aware of the construction activities occurring throughout the site each day. During each work day when potentially contaminated material was managed, excavated, stockpiled, or otherwise handled, GZA maintained a monitoring checklist for the environmental controls at each work zone. If non-compliance was observed, the contractor immediately halted work and took measures to conform to the compliance requirements prior to resuming work. The following summarizes items monitored each day.

Health and Safety:

- GZA observed EH&E monitoring/sampling for the presence of asbestos fibers at the perimeter of each work area.
- GZA monitored for dust (total and PM10), combustible gases, and volatile organic compounds, as described above.
- GZA monitored the perimeter of the work zones to confirm that fencing was in place to prevent public access.
Dust Control:

- GZA monitored the moisture content of the excavated and handled materials and confirmed that misting or wetting of subgrades, stockpiles, and truck loads, was applied as needed to proactively control dust.
- GZA monitored trucks hauling on-site material and observed them to be covered.
- GZA completed a daily checklist for the monitoring of covering stockpiles.
- GZA monitored for the presence of a water truck, hydrant with a hose, or other readily available stationary source of water at each work zone, to be used to proactively prevent dust or to mitigate dust if observed.
- GZA made observations for the absence of visible dust. If visible dust was observed, the work generating the dust was immediately halted, and the dust was suppressed prior to resuming work.
- GZA monitored for spillage of onsite material onto public roads, and cleaning/removal of this material if observed.

Decontamination

- GZA confirmed the presence of a wheel wash station, with a readily accessible source of water, at each work zone exit. (Wheel washes are not installed at the work zone entrances. The work zone entrances include traffic direction and signage which indicates that they are not an exit and that all vehicles and equipment must exit via the wheel wash stations.)
- GZA monitored for equipment decontamination prior to leaving each work zone, for equipment that may have come in contact with potentially contaminated materials.
- GZA monitored the wheel wash stations for material to be contained within the wheel wash area, and for the collection, filtering, and discharge of potentially contaminated wheel wash water.
- In certain specific circumstances, wheel wash stations were not installed. In lieu of using a wheel wash to decontaminate equipment, clean travel pathways were installed to prevent equipment from contacting potentially contaminated material. GZA monitored the clean travel pathways for the presence of potentially contaminated material. Clean travel pathways are considered to be an exception to the requirement of decontamination/wheel washes, and are used only used when necessary and on a limited basis, provided that:
  - Equipment only travels on asphalt or over only a short distance of clean travel pathway consisting of imported material;
  - Only limited earthwork activity, within a limited area and over a limited amount of time, is permitted (i.e., where a wheel wash is not feasible due to space constraints or a small work zone, this requires avoiding contact with potentially contaminated soils); and
  - There are no stockpiles of on-site material in the work zone.

- Stockpile Covering: Throughout the period of this URAM Status Report, Derenzo covered the working faces of active stockpiles and landforms constructed of excavated on-site materials with Gorilla-Snot soil
stabilization and dust control agent and/or GeoMatrix permeable fiber mat at the end of each working day. In addition to covering working faces, GZA performed daily observations of the active and inactive faces of stockpiles and landforms. If discrepancies were observed, the contractor applied additional Gorilla-Snot or GeoMatrix to cover exposed faces. GZA monitored to confirm that the covering agent (either Gorilla-Snot or GeoMatrix) was in adequate condition for dust control. Product descriptions for Gorilla Snot and GeoMatrix were appended to URAM Status Report No. 7.

Construction Dewatering

Throughout the period of this report, dewatering operations were performed as needed in construction areas. Electric pumps were set into perforated sumps and were utilized to control ground water in the excavations. Water removed from excavations was discharged into on-site upgradient recharge excavations. Based on visual observations, the discharged groundwater did not exhibit evidence of free product or sheen.

ADDITIONAL PROVISIONS UNDER URAM STATUS REPORT NUMBER 9

The following describes additional provisions instituted for this project that are based on further review of project and material disposal constraints.

Demarcation and Barrier Layers

As stated in URAM Status Report 7, a demarcation (Mirafi FW700 or equal) or barrier (Mirafi RS380i or equal) layer is to be installed below hardscape and softscape areas, respectively. In hardscape (paved) areas, the demarcation layer will be covered by at least one foot of cover material, including the components of the pavement. In softscape areas, the barrier layer will be covered by at least 18 inches of cover material.

As stated in URAM Status Report 8, a demarcation layer (Orange Knitted Warning Barrier by US Construction Fabrics, LLC or equal) below softscape areas has been added such that the establishment of trees, shrubs, and other vegetation will not be hindered by the presence of a barrier layer located 18 inches below grade. The Orange Knitted Warning Barrier will be installed and covered by at least 3 feet of cover material.

This URAM Status Report 9 includes additional provisions for softscape and hardscape areas. Upon further review of upcoming phases of the Project, it has become apparent that certain geotextiles are required for the structural integrity of bio-retention ponds and granite stone revetments.

- Softscape Areas: At bio-retention ponds and swales, a barrier layer consisting of Hydra Flex H40B geomembrane or equal will replace the Mirafi RS380i, and will be/has been installed and covered by at least 1.5 feet of cover material.

- Hardscape Areas: Below granite stone revetments, a demarcation layer consisting of Mirafi HP370 or equal will replace the Mirafi FW700, and will be/has been installed and covered by at least 1 foot of cover material, including the thickness of the revetment stone blocks.

The use of these materials will uphold the structural integrity of the design of the bio-retention ponds and revetments, and will meet the intent of the barrier and demarcation layers, installed in softscape and hardscape areas, respectively. Refer to Attachment 9 for product information on these geomembrane and geotextile materials. The areas where these materials are installed as a demarcation or barrier layer will be delineated on a plan that will accompany the AUL that will be filed for the Site.
Downsizing of Oversized Concrete and Rubble

During excavations for utilities and during demolition of various onsite structures, oversized concrete and rubble have been removed from the landfill material soil matrix and stockpiled at Lot A. These pieces are too large to be reused onsite below the barrier layer or to be disposed of off-site as ACWM. Therefore, these materials will be/have been downsized. On December 22, 2016, the MassDEP expressed agreement with the following two options for downsizing these materials.

Option 1: Decontaminate and handle oversize concrete/stone as non-ACWM:
- Bring materials to wheel wash (or equivalent decontamination pad in work zone).
- Decontaminate concrete/stone with water hose at the decontamination pad to remove any adhered soil/non-concrete debris. Power washing will not be used to clean concrete.
- Use a hoe ram to chip off embedded debris/soil that cannot be washed off. Chipping to occur at clean points on pieces of concrete/stone where possible.
- Handle chipped off materials as ACWM, by breaking up:
  - To fit in lined trailers if going offsite as ACWM.
  - To 6” minus for onsite reuse under marker barrier.
- Dust control and air monitoring per URAM/NT Plan to be in place during chipping/break-down.
- LSP representative (GZA) to observe cleaned concrete/stone and deem acceptably clean.
- Segregate clean concrete in clean location for unrestricted reuse, disposal, and/or processing.

Option 2: Treat oversize concrete/stone as ACWM:
- Break up concrete/stone using a hoe ram in work zone/stockpile area to suitable size. Chipping to occur at clean points on pieces of concrete/stone where possible:
  - To fit in lined trailers if going offsite as ACWM.
  - To 6” minus for onsite reuse under marker barrier.
- Dust control and air monitoring per URAM/NT Plan to be in place during chipping/break-down.
CLOSURE

MassDEP has not imposed any additional conditions on this URAM beyond those specified above.

It is the opinion of LSP Lawrence Feldman that this URAM is being conducted in accordance with the provisions of 310 CMR 40.0464.

Based on the current progress and anticipated duration of the UCRR Project, several additional URAM Status Reports will be issued over the course of this project. In accordance with Section 40.0466 of the MCP, UMASS Boston will submit a URAM Completion Report to MassDEP within 60 days of completing all URAM activities, including the final disposal/recycling of remediation waste.

Please contact the undersigned at 781-278-3700 if you have any questions regarding this URAM Status Report No. 8.

GZA GeoEnvironmental, INC.

Jason Ressler, P.E.  Randy Meuse
Project Manager  Consultant/Reviewer

Lawrence Feldman, LSP  
Senior Principal

Figures:  
Figure 1: Locus Map  
Figure 2: URAM Area  
Figure 3: Work Zones, Construction Activities, and Environmental Controls Plan  
Figure 4: Barrier Layer, Demarcation Layer, and Clean Cover Placement Plan  
Figure 5: Stockpile Location Plan

Attachments:  
Attachment 1: October 2016 Landfill Material Stockpile Characterization Sampling and Analysis  
Attachment 2: November 2016 Asphalt Stockpile Characterization Sampling and Analysis  
Attachment 3: February 2017 Landfill Material Stockpile Characterization Sampling and Analysis  
Attachment 4: March 2017 Uncrushed Concrete Stockpile Characterization Sampling and Analysis  
Attachment 5: April 2017 Landfill Material Stockpile Characterization Sampling and Analysis  
Attachment 6: September through December 2016 In-situ Precharacterization for Pavement Reclaiming  
Attachment 7: December 2016 In-situ Precharacterization for Temporary Roadway Realignment  
Attachment 8: Asbestos Air Monitoring by EH&E  
Attachment 9: Product Literature for Hydra Flex H40B and Mirafi HP370