November 18, 2016  
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. 8  
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. 8 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 Report 6, which was submitted to MassDEP on January 13, 2016. URAM Status Report No. 6 described the provisions to be taken to address the handling and management of excavated material that would be encountered during work associated with the installation of pile caps and other utilities in the area to the north of the Calf Pasture Pump Station, or CPPS (also referred to as the Tri-Gen Site). URAM Status Report No. 6 was approved with conditions by MassDEP on January 25, and the work described in that report is currently complete. URAM Status Report No. 7 described work conducted during the period from September 2015 through May 11, 2016, and discussed additional material management provisions to be instituted for the remaining project areas for the duration of the project.

Soil excavated during the installation of utilities, related structures, and roadways for the UCRR project is managed under the protocols set forth in the URAM Plan, the additional soil management protocols provided in URAM Status Report No. 7, and MassDEP’s Conditional Approval Letter dated May 19, 2016. Following receipt of the Conditional Approval Letter, MassDEP has visited the site and provided comments on excavated materials management protocols. On October 14, 2016, GZA, NV5, and UMB met with MassDEP regarding these comments, and additional management protocols have been instituted based on our interpretation of MassDEP’s expectations discussed during that meeting.

This URAM Status Report No. 8 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. Due to the size of the project, work is being completed in delineated segments. A fence surrounds each work zone and the public does not have access to the work zones. The UCRR project is currently anticipated to be completed in early 2018.

Construction on a new residence hall is scheduled to begin in the winter of 2016/2017, and the area covered under this URAM Plan and Status Reports has been revised, as shown on Figure 2. Earthwork associated with the new residence hall will follow the same construction and environmental control protocols as the UCRR project. However, the residence hall area will be turned over to a private developer prior to completion of the UCRR project. The developer submitted a RAM Plan for this work to MassDEP on 9/8/2016 under RTN# 3-33706, and received a Conditional Approval Letter on 11/8/2016.

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).

**SITE-SPECIFIC CONDITIONS REQUIREMENTS PROVIDED IN MASSDEP’S MAY 19, 2016 CONDITIONAL APPROVAL LETTER OF URAM STATUS REPORT NUMBER 7**

The following addresses information requested by MassDEP in its May 19, 2016, Conditional Approval Letter of URAM Status Report Number 7.

**FINAL DISPOSITION OF REMEDIATION WASTE**

The design team and LSP have requested a schedule for the final disposition of remediation waste from the contractor. The contractor has indicated the following:

1. Excavated material will be stockpiled at Lot A, Lot D, the former Track, or Lot S (South Lot).

2. Excavated material consisting of granular fill, such as existing landfill cover and existing aggregate base course beneath asphalt, will be segregated and stockpiled separately from excavated landfill material.

3. Excavated and stockpiled granular fill will be used as trench backfill below the demarcation/barrier layer.

4. Excavated and stockpiled landfill material will be culled of oversize and deleterious materials and used as new fill for the new landforms below the demarcation/barrier layer.

5. Imported material, or onsite material which testing indicates does not contain asbestos fibers (tested in accordance with the MassDEP’s May 19, 2016, Conditional Approval Letter of URAM Status Report Number 7), will be used/reused above the demarcation/barrier layer as final clean cover material.

6. Surplus material and material that cannot be reused on-site will be disposed of off-site.
A general schedule of construction activities for various areas of the Campus is provided in Figure 3. This figure was provided in URAM Status Report 7, and the timeline and respective dates have been pushed back and changed since then; however, this figure shows the general sequence of construction activities throughout the Campus. Please also refer to the Off-Site Disposal of Stockpiled Materials section of this report for a timeline of off-site disposal of materials to date.

LANDFORM ANALYSIS

GZA has performed slope stability analyses of the proposed landforms located at Lot S (South Lot), the former Track area, the Tri-Gen area (north of the Calf Pasture Pump Station), and at the western end of Lot A. Attachment 8 includes the following, as requested in MassDEP’s May 19, 2016, Conditional Approval Letter of URAM Status Report Number 7:

1. Design / grading plans for each of the landforms, including side-wall grades and slopes;
2. The estimated volume of remediation waste to be reused as fill in each of the new landforms; and
3. The results of slope stability analyses present both global (deep) factors of safety and veneer (shallow sliding) factors of safety. Shallow sliding factors of safety were evaluated for the final cover material sliding on the underlying geotextile demarcation/barrier layer and the geotextile demarcation/barrier layer sliding on the underlying reused landfill material.

The results of the analyses indicate that global and veneer factors of safety are adequate for the design grading and side slopes, and that additional slope stabilization measures are not required.

RISK-BASED ANALYSIS OF ACTION LEVEL FOR SOIL-DERIVED DUST PARTICLES

GZA performed a characterization of the risks to nearby residents and campus workers via inhalation of soil-derived dust during the construction period (2013 to 2018). GZA used project-specific soil analytical data to calculate risk estimates, assuming a Project dust action level concentration of 150 \(\mu\text{g}/\text{m}^3\), which is based on and does not exceed the National Ambient Air Quality Standards (NAAQS) and Massachusetts Ambient Air Quality Standards (MAAQS). The results of the Dust Exposure Risk Characterization, included in Attachment 9, conclude that for a dust level (expressed as PM10\(^1\)) not greater than 150 \(\mu\text{g}/\text{m}^3\), the residual oils and hazardous materials (OHM) in the soils would not pose significant risks to potential campus receptors or adjacent residential receptors. This action level concentration has been used since the beginning of construction, in 2013. Dust mitigation measures or work cessation are implemented immediately if the real-time dust monitoring concentrations exceed this action level, or if visible dust is observed.

URAM STATUS REPORT 8 INFORMATION

This URAM Status Report addresses the period from May 12 through October 31, 2016, 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 Figure 4 for details). Generally, the work consisted of excavating landfill material, stockpiling landfill material, placing excavated landfill as new fill for landforms, installing utilities, backfilling utilities with on-site sand and gravel below the demarcation/barrier layer, installation of the barrier

\(^1\) Concentration in air of particulate matter with an aerodynamic diameter of less than 10 micrometers
layer, and placement of imported material above the barrier layer. Work performed in this time period was observed to be generally consistent with the intent of the protocols outlined in URAM Status Report number 7.

- From May through July, the utility work to the north of the CPPS was completed. The work encompassed the installation of electrical and communications duct banks, BCBS water line installation, domestic water and fire protection line installation, and backfilling of prior installed thermal utilities.

- From May through August, excavated landfill was culled of oversized materials and debris and reused onsite as fill for the TriGen Landform. A geotextile barrier layer (RS380i) and at least 18 inches of imported cover material were installed over the reused landfill material to complete the TriGen Landform. As part of the TriGen Landform, the adjacent bioretention pond, and associated gabion dam, forebay, and overflow drain were installed.

- Construction in University Drive North, north of the Calf Pasture Pump Station, included the installation of storm drain lines, backfill and compaction of the soils, installation of the barrier layer, and placement and compaction of imported road base (landfill cover material).

- During August, construction began outside of the URAM Status Report 6 (Short Term) work area, under the provisions of URAM Status Report 7. EH&E performed asbestos air monitoring, wheel wash stations were constructed, water sources were identified and made ready 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. Refer to Figure 4 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.

- Starting in August, construction has been concentrated on the excavation and backfilling for new utilities in Lots B and C and along University Drive South. Several sewer manholes and associated sanitary sewer lines were installed.

- Starting in August, excavated landfill was culled of oversized materials and debris, and reused onsite as fill for the southern and central portions of the Lot S Landform. Excavated and culled landfill material has also been stockpiled above the central and southern portions of the Lot S landform. Derenzo has estimated that the volume of these stockpiles will be sufficient to complete the remaining landfill filling up to the geotextile barrier layer elevation. Approximately 15% of the geotextile barrier layer (RS380i) and imported cover have been installed in the southern portion of the Lot S landform. An approximately 10,000-cubic yard stockpile of on-site sand and gravel was previously placed in the northern portion of the Lot S landform area. Following reuse of this sand and gravel material as trench backfill below the demarcation/barrier layer, the culled landfill that is stockpiled on the central and southern portions of the Lot S landform will be spread in the northern area of the landform as new fill. This will be documented in subsequent URAM Status Reports.

- Starting in September, trench excavation, utility installation, and trench backfill and compaction were performed along Mount Vernon Street, west of Lot B. Sanitary sewer utilities and manholes were installed and backfilled. This work necessitated the installation of temporary fire hydrants to be used as water sources for wetting of excavated materials, and the temporary relocation of portions of the T-Gate roadway to maintain traffic from the current University Drive North to Mt. Vernon street.

- Material excavated for the installation of utilities has generally consisted of surficial asphalt, existing landfill cover material, and landfill material. These materials have been excavated, segregated, and stockpiled separately in the former Track area. The surficial asphalt was “peeled up” using an excavator and has been and will be disposed of off-site. The existing landfill cover is a granular material and will be used as trench backfill or landform fill below the
demarcation/barrier layer. The excavated landfill material will be used as new fill for the remaining landforms or will be disposed of off-site.

- Throughout the duration of this reporting period, stockpiles have been maintained and dust control agents have been applied to stockpiles. In general, the excavated materials were that were not reused as fill for landforms or backfill for trenches (below the demarcation/barrier layer) were stockpiled at Lot B, Lot S, Lot A, and the former track area.

**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.

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.

A total of 188 soil samples, including one to two soil samples from each of the borings, and samples from the stockpiles as noted below, 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).

**May Stockpile Characterization Sampling and Analysis**

In May 2016, GZA collected samples for disposal characterization analysis from six stockpiles. The stockpile locations, sample locations, and analytical results are provided in Attachment 1. The following stockpile samples were collected:

- 15 samples from a stockpile of uncrushed concrete (UC-1 through UC-15) that was in a soil matrix;
- One sample each from stockpiles of uncrushed asphalt (AS), granite blocks (GR), solid waste (SW), tires (TR), and wood (WP).

**June-July Stockpile Characterization Sampling and Analysis**

In June and July 2016, GZA collected samples for disposal characterization analysis from six stockpiles. The stockpile locations, sample locations, and analytical results are provided in Attachment 2. The following stockpile samples were collected:

- One sample each from stockpiles of uncrushed landfill tailings located at Lot S (UTA), and uncrushed landfill tailings from a stockpile located at the former Track area (UTT);
- 14 samples from a stockpile of unscreened/uncrushed landfill material at the Track area (LFT-1 through LFT-14);
- 12 samples from a stockpile of unscreened/uncrushed landfill material at Lot S (LFS-1 through LFS-12);
• 14 samples from a loam stockpile at building EMKi (LED-1 through LED-14); and

• 36 samples from a loam stockpile at Lot A (LA-1 through LA-36).

July Geoprobe In-situ Precharacterization Sampling and Analysis

During the period from June 28 through July 11, 2016, Geologic Earth Exploration, Inc. installed 75 borings at the Site (U-401 DB through U-410 DB; U-412 DB through U-438 DB; U-442 DB through U-450 DB; U-451 D through U-457 D; U-458 S through U-464 S; U-467 S through U-471 S; U-472 W through U-447 W; and U-477 TH through U-481 TH). A GZA representative observed and logged the drilling operations. The exploration location plan, boring logs, and analytical results are provided in Attachment 3.

The analytical results indicated TCLP-lead exceedances in four samples. Subsequent to this testing, it became clear that it would be possible to reuse these soils below the demarcation or barrier layer within the Area of Contamination (AOC), and that off-site disposal would not be necessary. 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 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, the recently-encountered TCLP soils have been excavated and reused on-site, below the barrier layer, to construct the Lot S landform. This information and details regarding these four locations was relayed to the MassDEP in a memorandum dated August 24, 2016.

Miscellaneous Characterization Sampling and Analysis

In addition to the sampling and analysis programs described above, three small sampling and testing events have occurred. These sampling and testing events are listed below and the analytical data is included in Attachment 4.

• Asbestos Testing of Loam Stockpile. GZA obtained 12 composite samples of loam from the stockpile (LE1 through LE12) adjacent to the EMKi building (refer to plan in Attachment 2 for location of stockpile). The intent was to perform a pilot-scale study to assess whether it was practical and feasible to test this material for onsite reuse, as required in MassDEP’s Conditional Approval Letter of URAM Status Report Number 7. The study concluded that it was not practically or logistically feasible to test this material for on-site reuse and that the results indicated that 2 of the 12 samples contained asbestos fibers. Following this pilot-scale study, it was assumed that this stockpile was ACWM and the loam was sampled and tested for disposal (refer to Attachment 2).

• Following sampling and analytical testing of asphalt (sample AS; refer to Attachment 1), additional asphalt was removed from Lot B and stockpiled at the Track area. Samples AS-2 and AS-3 were obtained from the additional stockpiled asphalt, as needed for off-site disposal.

• During demolition of a partially elevated concrete access ramp between the Clark and Service & Supply Buildings, the Contractor requested analytical testing of the underlying material. The base course material was tested for CAM-14 metals, SVOCs, and asbestos. Asbestos was not encountered in the sample (designated WR-1) and the analytical results are included in Attachment 4.

Stockpile Characterization and Pavement Precharacterization Data to be Included in the Next URAM Status Report

This URAM Status Report 8 presents the current Project progress. The following additional characterization data is currently pending or in progress, and will be included in the subsequent URAM Status Report.
• Additional sampling and characterization for off-site disposal is pending for stockpiles located at the former Track area, consisting of screened landfill, crushed landfill tailings, and loam.

• Additional in-situ precharacterization of the existing asphalt and base course has recently begun. To simplify reporting, the analytical testing for this effort will be presented in its entirety in the subsequent URAM Status Report. It is estimated that about 160 to 250 Geoprobe borings will be advanced to about 4 feet below current grades throughout select areas of the Campus roadways and parking lots. Proportionally composite samples of the asphalt and base course/existing landfill cover will be obtained and tested for reuse on-site as the new base course beneath new asphalt roadways, above the demarcation layer. Analytical testing for reuse will be completed in accordance with URAM Status Report 7 and MassDEP’s Conditional Approval Letter of URAM Status Report 7. This includes 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 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. Following completion of the borings and analytical testing, a plan will be created that indicates the areas of in-situ material that can and cannot be reused on-site above the demarcation layer. In areas where the in-situ asphalt and base course meet the analytical requirements to be reused above the demarcation layer, the asphalt and base course will be reclaimed and reused as described above. The reclaiming process includes mechanized crushing of the asphalt and blending with the existing aggregate base course. This reclaimed material will be stockpiled for reuse as base course under pavement at one of the stockpile management areas discussed herein. In areas where the in-situ asphalt and base course do not meet the analytical requirements for onsite reuse, the material will be removed using an excavator and will be segregated and stockpiled for reuse below the demarcation/barrier layer or for off-site disposal.

OFF-SITE DISPOSAL OF ON-SITE MATERIALS

Disposal Documentation of Drilled Micropile (DMP) Slurry

During the period from July 22 through October 22, 2015, eight truckloads of DMP slurry material, with a total weight of 265.77 tons, was transported to the Clinton Landfill in Clinton, Massachusetts. Disposal documentation had not been received from the Clinton Landfill at the time the previous URAM Status Reports were submitted. This documentation has now been received and provided to MassDEP; a copy is provided in Attachment 5.

Disposal of Onsite Precharacterized 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.

Starting on October 6, 2016, Derenzo loaded trucks with material for off-site disposal at the Crossroads Landfill facility (Crossroads) in Norridgewock, Maine. 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. A liner was placed in each truck bed prior to loading. Following loading, each truck was decontaminated prior to exiting the site onto public roadways. As of October 31, 2016, a total of approximately 7,579 tons (approx. 5,258 cubic yards) of material has been transported off-Site in 239 truck-loads, as summarized in the table below. Completed forms have not yet been received from Crossroads; they will be included in the next URAM Status Report.
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### Proactive by Design

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Note: For days where more than one material type was loaded, the material types listed include a visual estimate of the percentage of each type of material loaded into trucks for off-site disposal.

Following the completion of disposal of select stockpiles on the former Track area, the Contractor intends to continue off-site disposal operations with the loading, shipping, and disposal of the characterized stockpiles at Lot A.

### 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), a Thermo Scientific MIE pDR-1500 (PM10 dust meter), a MiniRae3000 Organic Vapor Meter, and a MultiRae Model PGM-6228 5-Gas Monitor. 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.

On July 15, 2016, GZA measured PM10 dust levels along the haul road at the east end of the short-term-work area that exceeded 150 µg/m³. The monitoring location was within approximately 20 feet of an area traveled by construction equipment where Derenzo had recently placed crushed stone. While the concentration of 0.2784 mg/m³ exceeded the threshold, it should be noted that the dust was generated by the imported crushed stone, and not landfill material. GZA informed Derenzo of the elevated dust levels and recommended that measures be taken to reduce dust concentrations. Derenzo immediately dispatched a water truck to the area to wet the material. No other air monitoring
readings or OVM readings exceeded the action levels indicated in GZA’s HASP for the “breathing zone” or in the Excavated Materials Management Specification.

**Air Monitoring by EH&E**

Since February 24, 2016, Environmental Health and Engineering (EH&E) has been on site monitoring/sampling air around excavation and work areas for asbestos particles in accordance with EH&E’s 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. Four (4) monitoring stations were operated at each of Derenzo’s work areas, encircling the activities. Each day one monitoring station operated two (2) monitors, with one redundant monitor for quality control (QC) purposes.

Results through April 22, 2016, are summarized in the previous URAM Status report. From February 24, to October 31, 2016, over 2,500 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 to date have been well below the MassDEP specified action level of 0.010 fibers per cubic centimeter (f/cc), except two isolated incidents, as described in Attachment 6. For these isolated instances on June 6 and October 18, 2016, confirmatory transmission electron microscopy (TEM) analysis indicated that the elevated PCM results were not related to asbestos emissions; no asbestos fibers were detected in these TEM samples. Based on the TEM results and after consulting with MassDEP, the contractor resumed work in these work zones.

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, the EH&E reports, and a Summary of Perimeter Asbestos Air Monitoring to Date memorandum are included in Attachment 6.

**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. Following our October 14, 2016, meeting with MassDEP, during each work day where potentially contaminated material was managed, excavated, stockpiled, or otherwise handled, GZA maintained a monitoring checklist for the environmental controls at each work zone. When non-compliance was observed, the contractor immediately halted work and took measures to conform to the compliance requirements prior to resuming work.

Reoccurring daily meetings have been instituted with the environmental consultants (GZA and EH&E) and contractors (Bond and Derenzo) to discuss the following day’s scheduled activities. This allowed the environmental consultants to stay aware of the construction activities occurring throughout the site 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 instituted 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 monitored for wheel wash stations, 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 indicate 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. Over the period of this Status Report, GZA has developed visual and physical methods to perform quality assurance for the clean Gorilla-Snot. If discrepancies were observed, the contractor readily applied additional Gorilla-Snot 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.

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 8**

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.

This URAM Status Report 8 includes additional provisions for softscape areas. Upon further review of upcoming phases of the Project, it has become apparent that the establishment of trees, shrubs, and other vegetation will hindered by the presence of a barrier layer located 18 inches below grade. For such cases, a demarcation layer, consisting of an “Orange Knitted Warning Barrier” by US Construction Fabrics, LLC or equal, will be installed and covered by at least 3 feet of cover material. This will allow vegetation to establish based on: 1) the ability for roots to grow through the aperture openings of the demarcation layer, and 2) the thickness of landfill excavated and replaced with cover material consisting of planting soils. Refer to Attachment 7 for product information on this geotextile demarcation material. The areas where this material is installed as a demarcation layer will be delineated on a plan that will accompany the AUL that will be filed for the Site.

**CLOSURE**

MassDEP has not imposed any additional conditions, beyond those specified above on the right to conduct this URAM pursuant to 310 CMR 40.0463(2).

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, INC.

Jason Ressler, P.E.  
Project Manager

Randy Meuse  
Consultant/Reviewer

Lawrence Feldman, LSP  
Senior Principal

Figures:

- Figure 1: Locus Map
- Figure 2: URAM Area
- Figure 3: Plan Showing Previously Anticipated Construction Dates
- Figure 4: Work Zones, Construction Activities, and Environmental Controls Plan

Attachments:

- Attachment 1: May Stockpile Characterization Sampling and Analysis
- Attachment 2: June-July Stockpile Characterization Sampling and Analysis
- Attachment 3: July Geoprobe In-situ Precharacterization Sampling and Analysis
- Attachment 4: Miscellaneous Characterization Sampling Analysis
- Attachment 5: Disposal Documentation of Drilled Micropile (DMP) Slurry, Clinton Landfill
- Attachment 6: Asbestos Air Monitoring by EH&E
- Attachment 7: Product Literature for “Orange Knitted Warning Barrier” by US Construction Fabrics
- Attachment 8: Landform Analysis
- Attachment 9: Risk-Based Analysis of Action Level for Contaminated Dust Particles

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