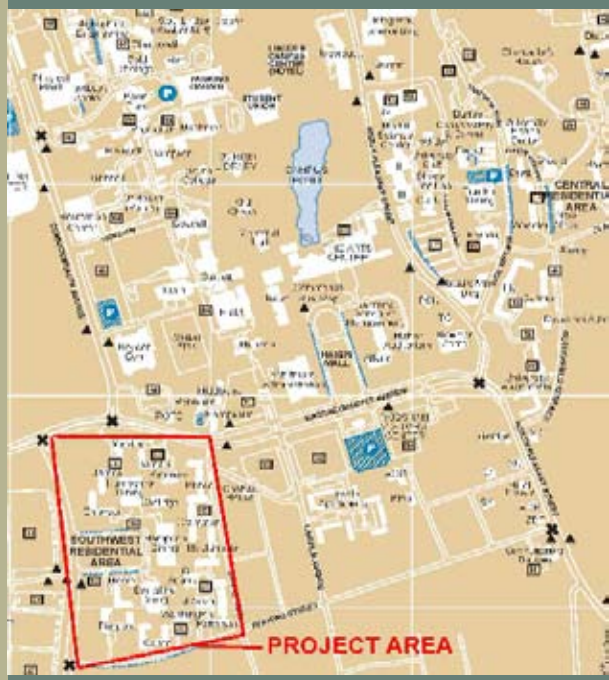
RELEASE ABATEMENT MEASURE COMPLETION REPORT AND CLASS A-2 RESPONSE ACTION OUTCOME

University of Massachusetts

Southwest Concourse

Amherst, Massachusetts



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1. INTRODUCTION

Woodard & Curran (W&C) has prepared this Release Abatement Measure (RAM) Completion Report and Class A-2 Response Action Outcome (RAO) Statement on behalf of the University of Massachusetts (UMass), for the disposal site identified by the Massachusetts Department of Environmental Protection (MassDEP) Release Tracking Number (RTN) 1-17872 (the "Site"). The Site is located at a portion of the UMass campus in Amherst, Massachusetts, identified as the Southwest Residential Area. The Site consists of an area of soils impacted by polychlorinated biphenyls (PCBs), released from caulking on concrete pads, walls, and other ground surface structures.

Since initial notification of the release in June 2010 to MassDEP, response actions to address release conditions have been regulated by both the United States Environmental Protection Agency (EPA) and the MassDEP. Response actions were conducted in accordance with an August 2010 EPA-approved Remediation Plan prepared under 40 CFR 761.61 and to a RAM Plan submitted to MassDEP under the Massachusetts Contingency Plan (MCP - 310 CMR 40.0000; MassDEP, 2010a).

Work under these plans was completed between June and October 2010. In February 2011, a PCB Completion Report was submitted to EPA documenting the activities completed pursuant to the Agency's Approval (W&C, 2011). In October, 2010, a RAM Status Report was submitted documenting the status of the RAM activities. This submittal serves as a RAM Completion Report, which was prepared in accordance with Section 40.0446 of the MCP to document completion of the RAM activities. The RAM Transmittal Form (BWSC106) is provided via electronic transmission with this report (refer to Appendix A).

Completion of the remedial response actions, effectively reduced the concentration of PCBs to below the MCP Method 1, S-2and S-3 soil standards applicable to current use of Site soils of 3 milligrams per kilogram (mg/kg), as well as, below the MCP Method 1, S-1 soil standard applicable to unrestricted future use of site soils (2 mg/kg). Therefore, in accordance with the Method 1 Risk Characterization, prepared as part of this submittal, a condition of No Significant Risk to human health, as well as safety, public welfare, and the environment exists at the Site. In addition, this submittal also serves as a Class A-2 RAO Statement prepared in accordance with Section 40.1036(2) of the MCP and documents achievement of a Permanent Solution at the Site. The RAO Transmittal Form (BWSC104) is provided via electronic transmission with this report (refer to Appendix A).

The Chief Municipal Officer and Board of Health for the Town of Amherst were notified of the availability of this Class A-2 RAO Statement, pursuant to 310 CMR 40.1403(3)(f). Copies of these notices are included in Appendix B.

1.1 SITE LOCATION AND DESCRIPTION

The Site is located at 42°22'58"N latitude and 72°31'46"W longitude. The Site is a small portion (approximately 5 acres) of the 1,450-acre area of land associated with the UMass campus. A Site Locus Map is provided as Figure 1-1.

The Site is currently improved with five high-rise towers and eleven low-rise residential halls that house approximately 5,500 students. The area is referred to as the Southwest Residential Area and was constructed in the mid-1960s. The buildings are constructed of concrete and are surrounded by either grass or hardscapes (paving stones, concrete, or asphalt). The Site is accessed from driveways along Fearing Street, University Drive, and Massachusetts Avenue. A Site Plan is provided as Figure 1-2.

1.2 SURROUNDING LAND USES AND RECEPTORS

The Site is located at the southwestern end of the UMass campus, east of University Drive, south of Massachusetts Avenue, and north of Fearing Street. The properties that abut the Site are all UMass-owned properties. The area that encompasses the Site is used for undergraduate student housing and is comprised primarily of dormitories and dining halls. The nearest human receptors are residents living at and visiting the Site.

The Massachusetts Geographic Information System (MassGIS) Site Scoring Map was reviewed online at: http://maps.massgis.state.ma.us/21E/viewer.htm for information pertaining to the location of natural resources located within 500 feet of the subject Site. The Site is not located within 500 feet of any drinking water supplies (Zone II areas, Interim Wellhead Protection Areas, Zone A areas, and/or Potentially Productive Aquifers). According to the Site Scoring Map and confirmed during site reconnaissance, there are no Areas of Critical Environmental Concern (ACECs), habitats of Species of Special Concern, habitats of Threatened or Endangered Species, fish habitats, vernal pools, Protected Open Space, or Sole Source Aquifers within 500 feet of the Site. The nearest surface water body is the Campus Pond, located approximately 0.4 miles north of the Site.

1.3 RELEASE HISTORY

The RAM was conducted as part of the Southwest Concourse replacement project, which is a comprehensive revitalization of the pedestrian core of the Southwest Residential Area. Between May and August 2010, the southwest concourse underwent renovations to paved and unpaved ground surfaces within the Southwest Residential Area. The work included within the approximately 5-acre area included, but was not limited to: removal and disposal of existing ground surface coverings (pavement, concrete, etc.); regrading and excavating soils to support new ground surface coverings, landscaping areas, and utilities; removal and replacement of granite staircases; removal and disposal of select retaining walls; and restoring select ground surfaces with concrete, pavement, pavers, etc.

During initiation of the project, caulking was observed along ground level joints/seams at retaining walls, granite steps, concrete structures, and other paved surfaces. Given the potential for this caulking to contain PCBs (based on the date of construction in the mid-1960s) and that it would be disturbed during the work, samples were collected to assess proper management and disposal requirements. Eighteen caulking samples were collected for PCB analysis from joints between granite steps, various concrete walkways, and ground surfaces, and one ceiling joint in a pedestrian underpass tunnel. These samples were reported with detectable concentrations of PCBs ranging between 63 and 130,000 parts per million (ppm).

Upon discovery of PCBs in the joint caulking and given, that as part of this project existing soils will be excavated and removed to allow for the construction of the new concourse components, select soils in targeted excavation areas were tested for PCBs to determine whether PCBs had migrated from the caulking into soil in these areas. Soil samples collected in May and June 2010 detected PCBs above the reportable concentration. On June 14, 2010, the MassDEP was verbally notified of the project details and status. As part of this conversation, RTN 1-17872 was issued for the Site. A Release Notification Form (RNF) for the 120-day reportable condition and a RAM Plan were submitted to MassDEP on June 18, 2010. The subject of the RAM Plan was the excavation and management of PCB-impacted soils, and included the results of approximately 225 soil samples collected to aid in determining the nature and extent of PCB-affected areas (W&C, 2010a). The status of RAM activities were described a status report submitted to MassDEP in October 2010 (W&C, 2010b).

Concurrent with these RAM activities, a plan to complete the removal and abatement of PCB-containing caulking (source material) and the adjacent impacted materials (concrete, granite, etc.), including soils, was developed and submitted to EPA on June 25, 2010, followed by a response to comments and Addendum #1 (July 27, 2010) and Addendum #2 (August 24, 2010). EPA issued written Approval for the work on August 30, 2010 pursuant to 40 CFR 761.61.

2. RAM COMPLETION STATEMENT

The objective of the RAM Plan was to properly manage PCB-impacted soils in areas planned for soil excavation in support of new infrastructure and subgrade components as part of the Southwest Concourse replacement project. Following soil removal, post-excavation samples were collected to determine the residual concentrations of PCBs, and site conditions were restored. Details of the RAM activities are presented below.

Although additional remediation activities (e.g., granite staircases, concrete walkways, etc.) were performed, these activities were conducted under the Approval issued by EPA and were not subject to this RAM or the MCP. As such, the discussion presented below only describes the soil remediation activities associated with the RAM.

2.1 DESCRIPTION OF WORK COMPLETED UNDER THE RAM

2.1.1 Site Controls and Communication

Prior to initiating any of the remediation activities, the following controls were implemented:

- A site-specific Health & Safety Plan was developed. All workers followed applicable Federal and State regulations regarding the work activities, including but not limited to OSHA regulations, respiratory protection, personal protective equipment, etc.
- Additional notifications and plans required for the work activities were prepared and submitted for approval, including Dig Safe permit and other excavation work related notifications required by the University.
- Given the amount of disruption to the concourse for the non-remediation-related activities, access to the entire concourse area was restricted by chain link fencing with controlled access points. Signage was posted on the fencing, and windows and doorways from the buildings to the concourse area. As a result, only project-related personnel accessed the active work areas.
- Further restrictions were applied during active PCB remediation activities within specific work areas; for example, when a granite staircase was being removed, the area was cordoned off with caution tape and/or construction fence to prevent access by non-remediation-related contractors.

- During the removal of PCB containing materials (caulking, soils, concrete), surficial wetting techniques were employed to control dust generation. In caulking removal areas, polyethylene sheeting was applied beneath the joint to collect any caulking during the removal.
- During the work activities, daily contractor meetings to review work activities and progress were conducted as well as a weekly meeting of all project stakeholders to review schedules, work progress, upcoming activities, etc. Because the project work area was totally controlled and isolated from non-construction related personnel, communications on work activities and disruptions to non-project personnel was not warranted on a frequent basis.

2.1.2 Environmental Monitoring

Perimeter ambient air monitoring within the support work zone and perimeter to this zone was conducted during active soil removal activities consistent with the Remediation Plan. To reduce particulate levels and exposures to airborne particulates, a combination of engineering controls (e.g., soil wetting) and personal protective equipment (PPE) was implemented as part of the work activities. The majority of results indicated that dust levels were below the target action level of 0.1 micrograms per cubic meter (mg/m^3) above background. Periodic dust readings above the action level were reported; however, these were attributed to other site activities not related to the PCB remediation work being conducted (i.e., passing trucks, soil work outside PCB impacted area, etc.). Copies of the perimeter air monitoring logs are included in Appendix C.

2.2 INVESTIGATORY AND MONITORING DATA OBTAINED DURING RAM IMPLEMENTATION

As presented in the RAM Plan, the objective of the soil remediation was to properly manage PCB-impacted soils in areas planned for soil excavation in support of new infrastructure and subgrade components as part of the Southwest Concourse replacement project. Given that this project is regulated both under 40 CFR 761 and MCP, the EPA's high occupancy area cleanup level of ≤1 ppm total PCBs was used as the remedial objective for no further restrictions. In areas not subject to excavation or for residual concentrations of PCBs following excavation completion in select areas, EPA's high occupancy area cleanup level of ≤10 ppm total PCBs was also used as the remedial objective with further restrictions. In these areas, the remaining soils were placed under a concrete cap meeting the requirements of 40 CFR 761.61(a)(7). The objective of the cap is to prevent or minimize human exposure, infiltration of water, and erosion.

Given the timing/schedule of the project, certain areas of the work area needed to be "cleared" to allow new construction to initiate in order to meet the overall schedule. As described in the Remediation Plan, management of asphalt and sub-base materials were in this category. Based on the data presented in the Remediation Plan, asphalt and sub base materials located within 12 inches of the building were removed and managed as PCB wastes. During removal, any loose caulking located at the ground surface to building or wall seam was removed and placed into containers for off-site disposal as ≥50 ppm PCB wastes.

A description of soil removal work and sample results in several areas were described in the RAM Plan (W&C, 2010a) and this data was used as the basis for the remedial approach developed for the soils across the project area, as presented in the following sections.

2.2.1 Soil Removal

The area subject to soil remediation covers approximately 5 acres. The remedial plan and approach that was developed and implemented at each area subject to excavation as part of the concourse replacement project consists of an area-specific characterization followed by PCB-impacted soil delineation, excavation and off-site disposal as PCB containing soils, verification sampling following initial excavation, and additional soil excavation/verification, as needed, based on the sample results. Soil removal activities were conducted in compliance with 40 CFR 761.61 and in accordance with the MCP regulations (310 CMR 40.0000). Only those soil areas confirmed to meet the cleanup levels were cleared for use by the General Contractor.

As part of this project, the following soil management areas were identified:

- Soils within one to two lateral feet and to a one foot depth of an existing structure with caulking present along the horizontal seam between the ground surface covering and the respective structure were excavated by the Remediation Contractor. Given the presence of caulking in these areas and the overall project schedule, limited characterization sampling was conducted prior to excavation and this material was assumed to contain PCBs and require off-site disposal.
- Soils within planned excavation areas to support new infrastructure (drainage, utility installations, planting beds, etc.) or areas that required excavation for final subgrades or other miscellaneous project conditions were typically characterized and managed at as-found PCB concentrations.

All soils designated for removal as part of the concourse replacement project that had PCB concentrations in excess of 1 ppm were excavated and transported off-site for disposal at an approved facility as bulk PCB remediation waste. All excavated soil was stored in lined, marked, and covered roll-off containers in accordance with 40 CFR 761.40 and 761.65.

Equipment, tools, excavator buckets, shovels, etc. were decontaminated through pressure washing, spraying, or wet wiping following use and/or between uses, as needed. At the completion of the work, non-disposable equipment and tools that handled PCB material were decontaminated using a hand application of CAPSUR, followed by scrubbing, and then rinsing the equipment with water. All decontamination fluids were collected and transferred to 55-gallon drums for off-site disposal with the liquid waste generated during the granite stair decontamination. Used PPE and decontamination materials were containerized for off-site disposal. Refer to Section 2.4 for additional discussion on off-site waste disposal.

Following soil excavation, post-removal verification sampling was conducted to demonstrate that the clean-up goals have been achieved.

2.2.2 Characterization and Verification Sampling

Characterization sampling was focused on site soils in the following targeted areas:

- Areas for excavation to install various project components, including retaining walls, drainage systems, curtain drains, curbing, and other similar components.
- Adjacent to potential source areas (e.g., caulking along structures, stairs, or other areas).
- Areas to provide spatial distribution of characterization data throughout the concourse.

As presented in the Remediation Plan submittal, initial work at the site was being performed under a 40 CFR 761.61(b) process and as such, samples were collected at a 10 foot or 5 foot sample frequency depending on the removal action. Based on these results, a modification was proposed and approved by EPA to change the sample frequency, as described below.

- 1 sample per every 20 linear feet along a planned excavation area (e.g. for drainage lines or curbing, etc.) or around the perimeter of a structure with caulking (provided the soil was not previously removed –see verification sampling below).
- In other excavation areas that were not drain lines, utilities, or structure perimeters, the sample frequency was typically a 10 foot square grid spacing.
- Sample depths ranged from the initial soils to depths of the planned excavation (e.g., if a curbing was to be installed to 2 feet below grade, then soil samples were collected from the initial 3 inches of soils as well as a subset of soils from a deeper depth, such as 12-15 inches below grade).

Depending on the specific area (project component), samples may have been collected adjacent to the former source (caulking) and at set distance from the caulking (e.g., 10 feet). As described in the verification sampling discussion below, soils adjacent to caulking along horizontal seams between the ground surface and a structure were removed along with this caulking. The area of removal was 2.5 feet laterally away from the building to a depth of approximately 1 foot. Based on discussions with EPA during Plan review, additional characterization samples were collected between the 2.5 foot excavation area and the 10 foot lateral area. A total of 14 samples were collected from soils 5 feet laterally from the buildings throughout the project area. Thirteen of the soil samples were collected from depths of 0-3 inches below existing grade and one was collected from a depth of 12-15 inches. Analytical results indicated that 5 samples were non-detect (with reporting limits < 1 ppm) and 8 samples were < 1 ppm (with an average PCB concentration of 0.345 ppm). Results from one sample indicated that PCBs were present at a concentration of 1.3 ppm. Additional excavation was conducted in this area per the procedures described above.

Post-excavation verification samples were collected in areas following soil removals and included:

- Adjacent to potential source areas (e.g., caulking along structures or retaining walls, stairs, or other areas). The area of removal was 2.5 feet laterally away from the building or wall to a depth of approximately 1 foot.
- Areas where characterization samples exceeded 1 ppm and the area was planned for excavation to install various project components, including retaining walls, drainage systems, curtain drains, curbing, and other similar components.
- Areas beneath caulked joints of concrete pads and walkways where the caulking, 12 inches of concrete on either side of the joint, and underlying soils beneath this removed concrete were removed.
- Sample depths were typically the bottom 3 inches of soil at the base of the excavation.

As presented in the Remediation Plan submittal, initial work at the site was being performed under a 40 CFR 761.61(b) process and as such, samples were collected at a 5 foot sample frequency depending on the removal action. Based on these results, a modification was proposed and approved by EPA to change the sample frequency, as described below.

- 1 sample per every 20 linear feet along the perimeter of a structure or wall where caulking was formerly located and soils were removed under the assumption that they were PCB

contaminated. If samples detected PCBs at concentrations > 1 ppm, then additional soil was removed and samples collected at a 10 foot grid spacing or 10 linear feet.

- In planned excavation areas with PCBs > 1 ppm that are not structures or wall perimeters with former caulking, a sample frequency on a 10 foot square grid spacing was typically implemented following soil removal.

In summary, 1,174 soil samples were collected and analyzed for PCBs which includes soil samples collected post-soil removal (verification samples) and soil samples collected prior to any removal actions (characterization samples). All samples were transported to the laboratory under standard chain of custody procedures, extracted using USEPA Method 3540C (Soxhlet extraction), and analyzed for PCBs using USEPA Method 8082.

A summary of the sample results is provided on Table 2-1 and the laboratory reports are provided in Appendix D. A review of the data indicates approximately 90% (88.9%) of the soil samples have been reported with PCB concentrations either non-detectable or $\leq$ 1 ppm. Figures depicting all characterization and verification soil samples are provided as Figure 2-1 (Hampshire Plaza), Figure 2-2 (Berkshire Plaza), and Figure 2-3 (Washington Plaza).

As indicated previously, in many areas soil samples were collected following an initial excavation in areas that were either adjacent to vertical structures with former caulking or in areas to support the concourse project (utilities, landscaping areas, etc.). In those areas that were scheduled for additional soil removals to support the concourse project and PCBs were detected above 1 ppm, additional soil was removed and post-verification samples collected. In addition, in areas that detected PCBs > 10 ppm, additional soil was also removed and verification samples collected following the excavation. This process was conducted in 33 isolated areas, which are depicted by cross-hatching on Figures 2-2 to 2-4. In each of these areas, soil removal was continued until the post excavation samples were < 1 ppm (in areas for additional subsurface concourse project work) or <10 ppm in areas where no additional soil removal was scheduled and the soil was to be covered by a concrete pad that met the requirements of a compliant cap per 40 CFR 761.61. Figures 2-2 to 2-4 depict the sample locations that were subsequently removed and their representative verification samples.

Following completion of the soil removal work, all soil samples were reported as $\leq$ 1 ppm throughout the concourse project except for 12 separate areas that exhibit PCB concentrations >1 ppm, but < 10 ppm and were subsequently covered by a concrete cap in accordance with 40 CFR 761.91(a)(7). The concrete cap consists of a uniform placement of a minimum of 6 or 8 inches of concrete over the area which exhibited PCBs > 1 ppm in order to prevent or minimize human exposure, infiltration of water, and erosion. These concrete caps were part of the original concourse rehabilitation design and as such extend over much greater areas than where residual PCBs were reported at > 1 ppm. If any breaches of the cap, which would impair the integrity of the cap are discovered, repairs shall begin within 72 hours of discovery. These areas are shown on Figure 2-4 and described on Table 2-2.

In addition to the 12 cap areas, one area on the Site exhibited residual concentrations > 10 ppm, but below the low occupancy criteria of 25 ppm. This area is located immediately adjacent to the north side of John Quincy Adams building and the excavation and verification work in this area is described in the following paragraphs.

An initial soil excavation along the building face below the horizontal caulking joint was conducted over an approximately 1 foot deep by 2.5 feet wide area. A total of five verification samples at 20 foot intervals were collected following excavation. Additional samples located 10 feet directly north of each

verification sample were also collected at the same time. Results of three verification samples were reported as greater than 1 ppm (1.88, 6.3, and 18 ppm). All four northern samples (10 feet away) were reported as having concentrations < 1 ppm.

Based on this data, the second excavation lift extended laterally 5 feet from the building to a depth of 2 feet. The first utility line (4" PVC) was discovered at this depth. The second set of verification samples were collected within the deeper excavation at each of the original sampling locations (offset by 6 inches), as well as additional samples at a 10 foot interval between samples. Of the seven total locations sampled as part of the re-dig, three samples detected PCBs > 1 ppm (6.2, 8.1, and 24 ppm).

Based on this data, the excavation was extended to a depth of 3.5 feet and verification samples collected for analyses. The new excavation completely exposed the 4-inch PVC pipe and a concrete duct bank for the building's steam supply. Results from the three verification samples were reported with PCBs > 1 ppm (1.5, 3.8, and 23 ppm); therefore, a third re-dig was performed to a depth of 4.9 feet, exposing the top of a cast-iron pipe running parallel to the building.

The three final verification samples were collected at three off-set locations with the results indicating PCBs > 1 ppm in 2 of the 3 samples (9.4 and 23 ppm). At this point, additional soil removal could not be conducted due to the presence of the underground utilities and the data, at least at one location, was consistently being reported at around 23 ppm from multiple depths. Based on discussions with UMass representatives, it was learned that previous utility work (water line break) had been performed in this area and it was possible that backfilling "mixed" soils in this area resulted in the anomalous readings in this area compared to the remainder of the Site.

As presented in Addendum #2 to the EPA Remediation Plan, verification samples from the final limits of the excavation exceeded 1 ppm; however, they were below 25 ppm (the low occupancy cleanup level). The final ground surface covering for this area will be planting beds. The location of these concentrations are positioned approximately 5 feet below ground surface and beneath/adjacent to several underground utilities. As such, access to this area is extremely limited and would only be encountered by UMass facilities personnel or contractors performing subsurface utility work. This location will be identified on drawings at UMass Facilities and Campus Planning and if utility work requiring excavation is needed in this area, proper worker safety, controls and material management will be performed. The location of this area is depicted on Figure 2-4. The use of the low occupancy cleanup level in this area was approved in EPA's August 30, 2010 Approval for the work.

2.3 STATEMENT OF THE FINDINGS AND CONCLUSIONS OF THE RAM

All soils at the Site containing PCBs in excess of the EPA cleanup level of 1 mg/kg (40 CFR 761) were removed from the Site in accordance with the RAM Plan, with the exception of 26 individual soil samples, represented by 13 different work areas (refer to Table 2-2). At these areas, residual concentrations ranged from greater than 1 to 23 mg/kg total PCBs and were managed through application of a deed restriction and concrete pad or ramp over the sample locations in accordance with 40 CFR 761.61(a)(7). Since arithmetic average of total PCB concentrations within an exposure point are appropriate to calculate exposure point concentrations under the MCP, and since the calculated exposure point concentration is below both the currently applicable Method 1 S-2 and S-3 soil standards of 3 mg/kg, as well as the most stringent Method 1 S-1 soil standard of 2 mg/kg applicable to future unrestricted use of the Site, no such restrictions to the soils are necessary to support a condition of No Significant Risk at the Site under the MCP (refer to Section 4 of this document).

2.4 DETAILS AND DOCUMENTATION OF THE MANAGEMENT OF REMEDIATION WASTE

Solid PCBs wastes generated during the work were placed in secure, lined, and covered roll-off containers in accordance with 40 CFR 761.65. Initially, the roll-off containers were staged near the work areas; however, upon filling the container and because of the number of anticipated containers and work space restrictions within the project work limits, they were moved to a central location on the UMass campus for temporary storage prior to off-site transport and disposal. All containers were properly labeled and marked in accordance with 40 CFR 761.40.

As described in Addendum #2 to the EPA Remediation Plan, roll-off containers of soil and concrete were generated during the performance of the work. As of the date of the addendum, 45 of the containers were to be managed and disposed off-site as ≥ 50 ppm PCBs wastes (hazardous waste landfill). Twenty-nine (29) of the roll-offs contain soils that were characterized prior to excavation in accordance with the sampling plans described in the Remediation Plan and Addendum #1. The analytical results indicated that all characterization samples representing these containers were < 50 ppm PCBs. As such, these containers were being managed and disposed of as PCB Remediation Wastes at concentrations of > 1 ppm and < 50 ppm (non-hazardous waste landfill permitted to accept PCB Remediation Wastes < 50 ppm).

Soils within the remaining roll-off containers were not characterized in situ prior to excavation and therefore, an alternate characterization plan to determine their proper disposal was proposed in Addendum #2 and approved by EPA. The basis for this alternate plan was two-fold: 1) review and use of all existing site soil data; and 2) collecting soil samples from each roll-off container for laboratory analyses.

As indicated in previous sections, approximately 90% (88.9%) of the soil samples were reported with PCB concentrations either non-detectable or ≤ 1 ppm with only 0.5% of the samples detecting PCBs ≥ 50 ppm (6 samples from only three locations). Given this information, there was a higher probability that the soils in these roll-off containers would be <50 ppm as opposed to ≥50 ppm PCBs. To support this statement, soil samples from six roll-off containers were initially collected for PCB analyses. The roll-offs were divided into halves and two random discrete samples per half (composite depth from the soil surface to 2.5 to 3 feet) were collected and submitted for analyses. All samples were well below 50 ppm with 7 of the 12 samples <1 ppm PCBs and the remaining 5 samples >1 ppm and <5 ppm.

As presented in Addendum #2 and discussed in an August 23rd meeting at EPA, supplemental data was collected from each of the subject roll-off containers to determine their disposal classification. Of the roll-offs in the above category, seven were previously sampled as part of the Addendum #2 submittal; therefore, a total of 35 roll-offs were sampled on August 25, 2010. Each of the 35 roll-offs were divided into three sections and one sample was collected from each third from the surface soil to a depth of 2.5 to 3 feet. The three samples were then composited into one sample and submitted to the analytical laboratory for PCB analysis (EPA method 3540C/8082). Analytical results from the roll-off samples indicated that the concentration of PCBs ranged from 0.12 to 9.7 mg/kg. As per Addendum #2, roll-offs containing PCBs < 15 ppm in the composite samples were to be disposed of as < 50 ppm PCB wastes at a non-hazardous waste landfill permitted to accept PCB Remediation Wastes < 50 ppm.

Based on these results, a final inventory and listing of all roll-offs containing PCB wastes was compiled and is provided as Table 2-3 and 2-4. Included in these tables are the roll-off container identification, the waste classification for disposal purposes, the waste media, and the source of the material. Of note, at the time of transport additional containers were generated due to some of the original roll-offs containing too

much material for transport. Under these conditions, materials from the original containers maintained their classification if they were moved to a different empty container.

Upon completion of the waste profiling and acceptance to the respective facilities, soils and concrete were loaded into transportation vehicles for shipment to the disposal facility.

- Soils, concrete, and all caulking classified as ≥ 50 ppm PCB wastes was segregated for disposal and transported under a hazardous waste manifest to the EQ- Wayne Disposal hazardous waste landfill located in Belleville, MI; 76 roll-off containers and 3 drums (caulking only) for a total of 1,167 tons of material.
- Soils and concrete classified as non-hazardous (>1 ppm and <50 ppm) was segregated for disposal and transported under an MCP Bill of Lading to Waste Management's TREE Turnkey Landfill in Rochester, NH; 60 roll-off containers for a total of 1,241 tons of material.
- Soils and concrete with PCB concentrations ≤ 1 ppm was managed without PCB restrictions (e.g., re-used on –site or recycled/disposed off-site).
- Polyethylene sheeting, PPE, and non-liquid cleaning materials was managed and disposed of off-site in accordance with 40 CFR 761.61(A)(5)(v). Three roll-off containers were transported and disposed at Waste Management's TREE Turnkey Landfill in Rochester, NH.

Liquid waste generated during decontamination of the granite steps or other decontamination activities (or as part of dust suppression that was collected on polyethylene sheeting) was containerized and designated for off-site disposal in accordance with 40 CFR 761.79. A total of 82 drums of liquid waste were generated during decontamination activities and shipped off-site to Waste Management's Model City Landfill for treatment as PCB wastes.

Copies of all manifests, waste shipment records, and certificates of disposal are provided in Appendix E.

2.5 SITE RESTORATION

As indicated previously, the project that has resulted in the need for a PCB management plan is a landscaping and concourse revitalization project. As such, the site restoration activities are extensive and include a combination of new infrastructure and ground surface improvements, such as planting areas, walkways, general use areas, etc.

2.6 DESCRIPTION OF ONGOING ACTIVITIES RELATED TO THE RAM

There are no ongoing activities related to the RAM. PCB-impacted soils have been appropriately managed in support of new infrastructure and subgrade components as part of the Southwest Concourse replacement project. Residually-impacted soils have been managed appropriately in consideration of EPA high and low occupancy cleanup criteria, which has also resulted in a condition of No Significant Risk having been achieved at the Site under the MCP (refer to Section 4 of this document). There are no restrictions necessary to maintain the condition of No Significant Risk and no additional response actions are planned to address the release condition assigned RTN 1-17872 prior to the filing of a Class A-2 RAO Statement. The RAO Statement is being filed concurrent with this RAM Completion Statement (refer to Section 5 of this document).

3. DATA QUALITY REVIEW

A data quality review was performed to confirm that the appropriate Response Action Performance Standards (RAPS) have been achieved with respect to data quality and use in accordance with the MCP at 40.0191(2)(c). The data quality review includes both a Data Usability Assessment (DUA) and a Representativeness Evaluation as summarized below. The DUA and Representativeness Evaluations were performed in consideration of the MassDEP Policy #02-320, titled the Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods used in Support of Response Actions for the Massachusetts Contingency Plan (CAM; MassDEP, 2010); and the MassDEP Policy #WSC-07-350, titled MCP Representativeness Evaluations and Data Assessments Policy (MassDEP, 2007).

As part of this process, quality assurance indicators were used to evaluate sample collection and measurement error. These indicators have been examined in the context of the intended use of the data, and an overall assessment of the data for rendering a waste site cleanup opinion. The LSP opinion of data quality and usability was rendered relative to an evaluation of the current understanding of the nature and extent of the release at the Site.

3.1 EXISTING DATA

A total of 1,174 soil samples were collected and analyzed at the Site between May and August 2010, of which 163 were subsequently removed during remedial activities. The location of these samples are shown on Figures 2-1 through 2-3; the date sampled, sampling depth, and analytical results are presented in Table 2-1.

Sample extraction and analysis via Soxhlet Extraction Method and Method 8082 for all soil samples subject to this usability assessment was performed by either Analytics Environmental Laboratories, LLC of Portsmouth, New Hampshire or Con-Test Analytical Laboratory of East Longmeadow, Massachusetts for a total of over 70 data packages. With the exception of three data packages completed early in the program by Analytics (66778, 66800, and 66803), all data packages were reported in accordance with the MassDEP's CAM, therefore, the data are considered "CAM" data (MassDEP, 2007) and are capable of achieving "Presumtive Certainty" which are data of known precision, accuracy, and sensitivity. The three data packages, which were not reported in accordance with the CAM are considered "CAM Non-Compliant", a sub-set of "Non-CAM" analytical data. "Non-CAM" data may be used in support of the RAO, after any uncertainties associated with identified data deficiencies, with respect to the overall accuracy, precision, and sensitivity of the data are evaluated. The data subject to this DUA pertains to soil samples collected at the site and are contained within the analytical reports listed below. Copies of the analytical reports are included in Appendix D. It should be noted that some of the analytical reports may contain the results of other sampled media (e.g., concrete and waste characterization data) that are not subject to this DUA.

Analytics Reports	Con-Test Reports				
66697	10E0728	10F0571	10G0033	10G0459	10G0874
66778	10E0729	10F0626	10G0034	10G0496	10G0875
66800	10E0749	10F0686	10G0036	10G0554	10G0900
66803	10F0205	10F0781	10G0038	10G0589	10H0033
	10F0206	10F0782	10G0078	10G0631	10H0034
	10F0207	10F0784	10G0160	10G0632	10H0061
	10F0208	10F0785	10G0193	10G0666	10H0105
	10F0283	10F0793	10G0227	10G0667	10H0154
	10F0326	10F0814	10G0228	10G0719	10H0188
	10F0364	10F0828	10G0272	10G0720	10H0189
	10F0394	10F0856	10G0340	10G0777	10H0222
	10F0476	10F0857	10G0378	10G0835	10H0349
	10F0541	10F0858	10G0380	10G0839	10H0797
	10F0542	10G0032	10G0429	10G0873	

3.2 DATA USABILITY ASSESSMENT

The purpose of the DUA is to evaluate the quality of the dataset and to determine its usability to support decisions in the RAO Statement, including the degree of risk posed by PCBs remaining in soils at the Site (refer to Section 4 of this report). The data usability assessment includes a field component and analytical component. The field component evaluates the sampling method, sample preservation, sample handling, and holding times to establish compliance with the applicable methods and protocols and thereby confirm that the samples analyzed at the laboratory are representative of the sampling point. The analytical data usability assessment is used to evaluate whether the analytical data points are scientifically valid and defensible and of a sufficient level of precision, accuracy, and sensitivity to be used in the representativeness evaluation.

A third-party validator, Data Check, Inc. of New Durham, New Hampshire, conducted a data validation review of the data in a manner consistent with EPA Region I Data Validation Functional Guidelines for Evaluating Environmental Analyses. Data Check's review included a check of the laboratory data and documentation, and a review of select quality assurance and quality control parameters, including holding times; surrogate recoveries; field and method blank results; matrix spike recoveries and relative percent differences (RPD); laboratory control sample/duplicate results; field duplicate results; and column RPDs. Copies of Data Check's data validation summaries are included in Appendix F. As with the laboratory analytical reports, some of the validation summaries may contain the results of other sampled media (e.g., concrete and waste characterization data) that are not subject to this DUA. The data validation results are summarized in the field and analytical quality control assessments presented in the following sections.

3.2.1 Field Quality Control Assessment

A review of the applicable field quality control elements, as listed below was performed to evaluate sample integrity.

- Soil samples were collected with hand tools using consistent methods, and sampling tools were decontaminated between sample locations (each sample was collected from a discrete location).
- Sample containers were obtained from the laboratory, pre-cleaned, and without preservative as prescribed by the sample method.
- Sample containers were labeled and packed on ice in coolers immediately after collection and were accompanied by chain-of-custody forms from the time of collection until laboratory delivery.
- Sample containers were received at the analytical laboratory on ice and were extracted and analyzed within the holding times allowed by the Soxhlet Extraction Method 3540C and Method 8082.

In addition, field duplicates and equipment blanks were collected at frequency of one sample per twenty primary samples to provide indicators of field accuracy, precision, and sensitivity. The results of the field quality control assessment indicate the field quality control requirements have been met and the soil sample data have not been affected as a result of sample collection or handling methods, with exceptions noted in Appendix F. The affected data were qualified as estimated in Tables 2-1. No primary soil sample data were rejected as a result of the field quality control assessment.

3.2.2 Analytical Quality Control Assessment

An analytical data usability assessment was performed for the soil samples subject to this DUA. The first step in the analytical DUA was to review the data set to determine whether the data achieved Presumptive Certainty as defined in WSC-CAM-VII A. Data that have Presumptive Certainty are also referred to as "CAM Compliant" data. CAM Compliant means an analytical result: 1) determined using an MCP Analytical Method detailed in the CAM; 2) that complies with the method-specific QC analytical requirements specified in the CAM; 3) with an evaluation of the compliance with method-specific performance standards with deficiencies narrated as necessary; and 4) reported in the format specified in the CAM for MCP analytical data. Compliance with the QC requirements and performance standards for these protocols will result in analytical data with "Presumptive Certainty" status. As previously indicated, analytical data with "Presumptive Certainty" status are data for which the MassDEP stipulated the precision, accuracy, and sensitivity have been adequately determined. Effective July 2010, the MassDEP revised the required report format. As such, the analytical quality control assessments specific to the applicable reporting formats effective at the time of the various RAM sampling events are presented in the following sections. As discussed above, three of the analytical data packages are "Non-CAM" analytical data. The remaining data packages are "CAM" analytical data, some of which were performed with CAM protocols effective prior to July 1, 2010, and some of which were performed with the current CAM protocols. Analytical quality control assessments for the three different protocols are presented in the following sections.

3.2.3 Non-CAM Soil Samples

As described above, three Analytics data packages (66778, 66800, and 66803) were not reported in accordance with the CAM, and are considered "CAM Non-Compliant" analytical data. Therefore, a more traditional approach to assessing precision, accuracy, and sensitivity was performed to evaluate their usability. The results of this assessment is presented below.

3.2.3.1 Precision

Precision is a measure of mutual agreement among individual measurements, under prescribed conditions (i.e., random error). Precision may be evaluated qualitatively or quantitatively. Qualitative assessments of precision are based upon evaluations of larger data sets and will consider the range of concentrations encountered for a complete data set for a location or area. Quantitatively, the results reported for the samples within the data packages are consistent with those expected based on comparison to the larger data set. For this data set an acceptable level of precision has been achieved since PCBs were sometimes detected in characterization samples collected in the vicinity of potential source areas, and low to non-detect concentrations were detected in verification samples collected following soil removal.

Quantitatively, precision is generally expressed as the Relative Percent Difference (RPD) between duplicate samples. Duplicates are two samples that are handled in an identical manner and the RPD of the measured results represents the precision (reproducibility) of the measurements. Review of the RPDs reported for matrix spike duplicates, laboratory control sample duplicates, and columns indicated acceptable precision, with exceptions of the column RPD for one sample in package 66800 (refer to Appendix F). The affected data were qualified as estimated in Table 2-1. Overall, these result indicate an acceptable level of precision with respect to the laboratory's preparation and/or analysis of samples.

3.2.3.2 Accuracy

Accuracy is the degree of agreement of a measurement with an accepted reference or true value. The difference between the measurement and the true value is usually expressed as a percentage or ratio. For these three data packages, the measurement of accuracy in the sample matrix was evaluated based on surrogate and laboratory control sample recoveries. All recoveries were within acceptance ranges.

3.2.3.3 Sensitivity

Sensitivity is the ability of the laboratory method to detect and quantify the contaminant of concern at the concentration of interest (i.e., 1 mg/kg 40 CFR 761 cleanup standards), expressed at the reporting limit. As such, sensitivity was evaluated based on a review of the sample quantitation and reported quantitation limits. Laboratory reported detection limits met the site data quality objective (i.e., a reporting limit $\leq$1 mg/kg) for all samples in the data set, even for diluted samples, indicating acceptable sensitivity for use in making project decisions.

3.2.4 CAM Soil Samples (Pre – July 1, 2010 Soil Samples)

With the exception of the three analytical data packages evaluated above, the report format specified in the CAM for samples analyzed prior to July 1, 2010 requires the analytical laboratory to provide an Analytical Report Certification for each set of samples submitted for analysis. The Certification requires the laboratory to answer the following questions:

A. Were all the samples received by the laboratory in a condition consistent with those described on their Chain-of-Custody documentation for the data set?

B. Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet the appropriate performance standards or guidelines?

C. Does the analytical data included in this report meet all the requirements for "Presumptive Certainty," as described in Section 2.0 of the MassDEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?

D. Was the VPH or EPH method run without significant modifications, as specified in Section 11.3?

E. Were all QC performance standards and recommendations for the specified analytical method(s) achieved?

F. Were results for all analyte-list compounds/elements for the specified method(s) reported?

An affirmative response to questions A through D (if applicable) and a response to questions E and F are required for Presumptive Certainty status. The Analytical Report Certifications were reviewed for compliance with the Presumptive Certainty requirements. The review indicated that each data set met the Presumptive Certainty requirements; however, certain QC performance standards were not met requiring a review of the QC performance standards of individual samples to assess the usability of the data in question. Non-conformance issues related to the QC performance standards were reported in the case narratives and were further evaluated during the data validation detailed in Appendix F. These non-conformances, primarily related to loss of surrogates during dilution and elevated spike recoveries, were determined not to have the potential to sufficiently bias any primary soil samples such that the results would not be usable. As a result of the data validation process, data qualifiers were attached to certain sample results to indicate that both detected and non-detect results were estimated (J and UJ, respectively). It should be noted that sample dilution was required for certain samples, as discussed in the narratives, resulting in increased reporting limits.

3.2.5 CAM Soil Samples (Post – July 1, 2010 Soil Samples)

The report specified in the CAM for samples analyzed after July 1, 2010 requires the analytical laboratory to provide an Analytical Report Certification for each set of samples submitted for analysis. The Certification requires the laboratory to answer the following questions:

A. Were all the samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within the method holding times?

B. Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?

C. Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?

D. Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"

E. a) VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).

   b) APH and TO-15 Methods only: Was the complete analyte list reported for each method?

F. Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?

G. Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?

H. Were all QC performance standards specified in the CAM protocol(s) achieved?

I. Were results for all analyte-list compounds/elements for the specified method(s) reported?

An affirmative response to questions A through F (if applicable) and a response to questions G through I are required for Presumptive Certainty status. The Analytical Report Certifications were reviewed for compliance with the Presumptive Certainty requirements. The review indicated that each data set met the Presumptive Certainty requirements; however, certain QC performance standards were not met requiring a review of the QC performance standards of individual samples to assess the usability of the data in question. Non-conformance issues related to the QC performance standards were reported in the case narratives and were further evaluated during the data validation detailed in Appendix F. These non-conformances, primarily related to loss of surrogates during dilution and elevated spike recoveries, were determined not to have the potential to sufficiently bias any primary soil samples such that the results would not be usable. As a result of the data validation process, data qualifiers were attached to certain sample results to indicate that both detected and non-detect results were estimated (J and UJ, respectively). It should be noted that sample dilution was required for certain samples, as discussed in the narratives, resulting in increased reporting limits.

3.2.6 Data Usability Assessment Summary

The data usability assessment consisted of a field component and an analytical component. The conclusions of the assessment are summarized as follows:

- The field quality control assessment indicated that the field quality control requirements were met and the soil sample quality was not degraded or affected as a result of sample collection or handling methods, with the exceptions noted.
- The analytical quality control assessment indicated that, with limited exceptions, the "CAM" data are considered "CAM Compliant" and have achieved Presumptive Certainty. Although certain QC performance criteria were not met, the non-conformances were not sufficient to render any of the soil sample data as unusable. The Non-CAM data were determined to be of sufficient precision, accuracy, and sensitivity.
- The assessment indicates that the analytical results reported for samples collected during the RAM implementation are scientifically valid and defensible and of a sufficient level of precision, accuracy, and sensitivity to support the evaluation of the nature and extent of PCBs in soils at the Site, and the degree of risk posed by PCBs in soils at the Site.

The results of the data usability assessment were reviewed in consideration of the data quality objectives for the Class A-2 RAO Statement, supported by a Method 1 Risk Characterization. The primary objectives were to confirm that the existing data set was usable to support decisions with respect to

conditions within the disposal site boundary and to estimate exposure point concentrations of PCBs in soils. A review of the data indicate that these data quality objectives have been met, and the data are of sufficient quality for use in rendering a Waste Site Cleanup Opinion.

3.3 REPRESENTATIVENESS EVALUATION

A Representativeness Evaluation was performed to evaluate and demonstrate the adequacy of the spatial and temporal data sets used to support the decisions in the RAO Statement, including degree of risk posed by PCBs remaining in soils at the Site as presented in Section 4 of this report. Per MassDEP guidance, the elements of the Representativeness Evaluation are presented in the following sections (MassDEP, 2007).

3.3.1 Conceptual Site Model

Certain joint caulking used as part of standard construction practices for masonry buildings and concrete structures erected between the 1950's and late 1970's is known to have been manufactured with PCBs. PCBs were added to caulking for durability, resistance to degradation and as a softener/plasticizer for application. Production and approved usage of PCBs was halted in the United States in the late 1970's. As indicated in Section 1, the Southwest Residential Area was constructed during this time period.

Due to the porous nature of concrete and other masonry surfaces, PCBs in caulking may penetrate into adjacent materials during application or over time, may leach or weather, and/or may be disturbed during renovations or other work. Characterization data indicated that percent level concentrations of PCBs have been detected in original caulking applied to expansion joints and long the horizontal seam between the ground surface covering and masonry structures along the concourse. Lower concentrations of PCBs were also detected in adjacent concrete, adjacent ground surface coverings, and soils.

Based on the concentration and distribution of PCBs detected in adjacent materials, it is apparent that the caulking used in original construction was the source of PCBs. In general, concentration gradients identified in the adjacent materials demonstrated a reduction in total PCBs with increasing distance from caulked joints and increasing depth from the ground surface.

Human receptors that may access the Site include student residents living and visiting at the Site, as well as visitors, and UMass employees performing maintenance in the area. The closest environmental receptor is the Campus Pond located approximately 0.4 miles from the Site.

Most of the Site investigation work was conducted in the upper 1.5 foot of soils and within 30 feet of source areas. The soils consist primarily of topsoil and sandy material encountered during sampling and excavation work.

No groundwater or surface water investigations were performed as part of the RAM activities, and as such, no hydrologic information was obtained. Groundwater was not encountered during investigation and remediation activities, which were conducted to a maximum depth of approximately 4 feet, 9 inches below ground surface. It is not anticipated that the residual PCBs will be significantly transported within the environment or migrate into groundwater because:

- With minimal exceptions, the remaining PCB contaminant mass was reported at concentrations ≤1 ppm, and are primarily at or near the ground surface;

- PCBs have a low solubility in water and have a tendency to absorb to soils, making it unlikely that the compound will travel further than its current location; and,
- Groundwater was not encountered during any soil removal activities.

Residual concentrations of PCBs in soil are very low, (mostly ≤1 ppm), leaving very little contaminant mass with a potential for future migration. However, due to the persistent nature of PCBs in the environment, the residual PCBs are likely to remain in soils at or near the current concentrations.

3.3.2 Use of Field Screening Data

No field screening techniques were used during implementation of the RAM.

3.3.3 Sampling Rationale; and Number, Spatial Distribution, and Handling of Samples

Soil characterization sampling conducted prior to soil removal generally achieved horizontal and vertical delineation of soils containing total PCB concentrations greater than the 1 mg/kg cleanup level. During RAM implementation, all soils with PCBs greater than 1 mg/kg were removed as confirmed by verification samples collected from the excavations, with the exception of 26 individual samples at 13 different areas, which have total PCB concentrations ranging from greater than 1 to 23 mg/kg. The detailed sampling plan, which was conducted in accordance with an EPA Approval, is detailed in Section 2.

The existing data set is sufficient to determine exposure point concentrations for the Site. The data provides sufficient delineation to horizontally and vertically delineate the Site, identify background, and calculate exposure point concentrations.

3.3.4 Temporal Distribution

Site conditions do no warrant monitoring or sampling over time because:

- The source of contamination (caulking) on the Site has been removed;
- Cleanup levels have been achieved where feasible; and,
- PCBs are persistent in the environment and are not expected to degrade significantly from present levels.

3.3.5 Completeness

With one exception described below, no data gaps have been identified to date. All samples submitted to the laboratory were analyzed as requested and all sample results reported by the laboratory were determined to be usable data. At one location, a verification soil sample collected from the base of a retaining wall following removal of Prince South Stairs indicated a total PCB concentration of 18 mg/kg at SWC-VBS-688 at a depth of 12-15 inches below grade. Additional concrete and soils were removed during stair replacement to a depth of 24 inches; however a verification sample was not collected to confirm residual PCB concentrations (refer to Table 2-2). Since PCB concentrations indicate decreasing PCB concentrations with increasing depths below surface grade, it is likely that residual concentrations in this area would be less than 18 mg/kg and one additional data point to the over 1,000 existing soil samples would have a negligible impact on the overall exposure point concentration. Laboratory

analytical results for nearby samples indicate low (0.37 mg/kg at SWC-VBS-689) to non-detect PCB concentrations (SWC-VBS-694, SWC-VBS-695, and SWC-VBS-1357).

3.3.6 Inconsistency and Uncertainty

There is no known information regarding groundwater conditions at the Site; however, observations made during RAM activities did not indicate that the former PCB contaminant mass in soils was nearing the groundwater table, as all soils at the excavation base were dry. Confirmation of the contaminant mass removal at the maximum depth of 4 feet, 9 inches, coupled with the fate and transport characteristics of PCBs (relative immobility and low solubility), indicate evaluation of groundwater conditions were not warranted.

3.3.7 Information Considered Unrepresentative

As described in Section 2, soils removed during RAM activities included 163 soil sample locations as depicted on Figures 2-1, 2-2, and 2-3 and presented in Table 2-1 that are no longer on-site, given they were excavated during the remediation activities. These samples and their associated data are no longer considered representative of site conditions, and are not considered when characterizing the degree of risk posed by PCBs remaining in Site soils (refer to Section 4 of this report).

In addition, 13 concrete samples were collected from the base of soil excavations as depicted on Figures 2-1, 2-2, and 2-3 and presented in Table 2-1. As these samples are concrete, they are not representative of a soil matrix and therefore are not considered when characterizing soil exposure point concentrations (refer to Section 4 of this report).

3.3.8 Representativeness Summary

In summary, the overall representativeness of the data was evaluated qualitatively based on site use, the conceptual site model, pre- and post-remediation sampling data, and observations made during field activities. Based on continual evaluation of site information and data through completion of the RAM activities, the data described herein are concluded to be adequately representative of subsurface conditions at the Site. Generally consistent procedures and laboratory analysis of the data were achieved, and data completeness goals based on development and implementation of workplans to address data gaps and remedial actions, were met.

4. METHOD 1 RISK CHARACTERIZATION

Woodard & Curran conducted a Method 1 risk characterization (Method 1 RC) to evaluate the potential risks posed to human health, safety, public welfare, and the environment at the Site. This Method 1 RC has been prepared in support of a Class A-2 RAO for the Site, as described in Section 5.

Chemicals of potential concern (COPCs) at the Site were PCBs in soil, for which Method 1 standards are available. Although PCBs are considered bioaccumulative constituents, the Site does not provide suitable habitat for ecological receptors due to its highly developed nature. Therefore, a Method 1 risk characterization is appropriate for evaluating risk at the Site.

The Method 1 RC compares the exposure point concentrations (EPCs) of COPCs detected at the Site to promulgated MCP Method 1 standards to determine whether a condition of No Significant Risk (NSR) for human health, public welfare and the environment been achieved at the Site. This method considers both current and future Site activities and uses. Additionally, an evaluation of the risk of harm to safety has been included in the Method 1 RC, in accordance with 40.0960 of the MCP.

A comparison of the concentrations of COPCs in soil to applicable Method 1 standards demonstrates that all EPCs are below MCP Method 1 standards. Therefore, a condition of NSR to human health, public welfare and the environment exists. In addition, the separate evaluation for safety indicates that a condition of NSR to safety has been achieved at Site.

4.1 SITE DESCRIPTION

A detailed description of the Site, including its history and discussion of assessment activities and data collected at the Site is provided Sections 1 through 3. This section reiterates only a brief summary of the activities conducted at the Site with regard to the potential for human exposures to impacted media at the Site.

The Site is located at the southwestern end of the UMass campus, east of University Drive, south of Massachusetts Avenue, and north of Fearing Street. The properties that abut the Site are all UMass-owned properties. The area that encompasses the Site is used for student housing and is comprised primarily of dormitories and dining halls. The nearest human receptors are student residents living and visiting at the Site. The boundaries of the Site are shown on Figure 1-2.

The Massachusetts Geographic Information System (MassGIS) Site Scoring Map was reviewed online at: http://maps.massgis.state.ma.us/21E/viewer.htm for information pertaining to the location of natural resources located within 500 feet of the subject Site. The Site is not located within 500 feet of any drinking water supplies (Zone II areas, Interim Wellhead Protection Areas, Zone A areas, and/or Potentially Productive Aquifers). According to the Site Scoring Map and confirmed during Site reconnaissance, there are no Areas of Critical Environmental Concern (ACECs), habitats of Species of Special Concern, habitats of Threatened or Endangered Species, fish habitats, vernal pools, Protected Open Space, or Sole Source Aquifers within 500 feet of the Site. The nearest surface water body is the Campus Pond, located approximately 0.4 miles north of the Site.

4.2 CHARACTERIZATION OF RISK TO HUMAN HEALTH, PUBLIC WELFARE, AND THE ENVIRONMENT

As previously mentioned, a Method 1 RC was used to characterize risk of harm to human health, public welfare and the environment. The Method 1 RC is presented below and consists of five main components:

hazard identification, exposure assessment, exposure point concentrations, risk characterization, and an uncertainty analysis. Risk to safety is addressed in Section 4.3.

4.2.1 Hazard Identification

The objective of the Hazard Identification is to present the available sampling data and select the COPCs for each medium of concern.

Nature and extent of site-related impacts to soil is described in detail in Sections 2 and 3, herein. As previously mentioned, the Site consists of an area of soils impacted by PCBs from caulking on adjacent structures. Groundwater at the Site is not anticipated to be impacted by this release. Since initial release notification in June 2010, response actions to address release conditions have been regulated by both the United States EPA and the MassDEP. Based on the type of release, the primary COPCs at the Site are total PCBs.

All soils at the Site containing PCBs in excess of the USEPA cleanup level of 1 mg/kg (40 CFR 761) were removed from the Site in accordance with the RAM Plan, with the exception of 26 individual soil samples represented by 13 different work areas (refer to Table 2-2). At these areas, residual concentrations ranged from greater than 1 mg/kg to 23 mg/kg total PCBs and were managed through application of a concrete pad or ramp over the sample locations in accordance with 40 CFR 761.61(a)(7).

Over the course of investigatory and remedial activities at the Site, a total of 1,174 soil samples were collected and analyzed for total PCBs. Data obtained during the various environmental investigations were used to define the limits of soil excavation and delineate the boundaries of the Disposal Site. Based on the concentration and distribution of PCBs detected in adjacent materials, it is apparent that the caulking used in original construction was the source of PCBs. In general, concentration gradients identified in the adjacent materials demonstrate a reduction in total PCB concentrations with increasing distance from caulked joints and increasing depth from the ground surface. Of the 1,174 samples collected to date, 163 samples were subsequently removed during remedial activities. Therefore, a total of 1,011 soil samples (exclusive of field duplicates) are considered to be representative of current Site conditions; these data are shown on Table 4-1 and statistically summarized on Table 4-2.

As shown on Table 4-2, soil analytical results indicate that concentrations of total PCBs in soil range from non-detect to 23 mg/kg with a mean of 0.32 mg/kg. The maximum concentration was detected in excavation confirmatory sample SWC-VBS-2141, collected from the north side of the John Quincy Adams House at a depth of 4.75 to 5 ft bgs. Additional excavation could not conducted at this location due to the presence of utilities in the excavation. However, given the depth, the presence of utilities and that these soils are located beneath landscaped planting beds, exposure to these soils is unlikely.

Groundwater is not considered part of the Site. Therefore, no groundwater samples were collected and groundwater was thus excluded as a medium of concern in the risk assessment.

4.2.2 Exposure Assessment

The objective of the Exposure Assessment is to estimate the type of potential exposure related to COPCs present at or migrating from the Site. Exposure is described based on the populations potentially exposed to contaminated media via specific exposure pathways, as determined by current and future potential land use.

The Site consists of landscaped (mulched areas, shrubs, trees, some grassy areas, etc.) and hardscaped (concrete, pavement, masonry pavers, etc.) areas of the Southwest Residential area. The area that encompasses the Site is used for student housing and is comprised primarily of dormitories and dining halls. The human receptors most likely to be exposed to impacted Site soils under current conditions include student residents living and visiting at the Site; site visitors, trespassers, and UMass workers may also be exposed, but at a lower frequency. Because the majority of the Site is currently under hardscaped areas, these receptors would have a low potential to be exposed to COPCs in surface soil (from 0 to 3 ft bgs) under current conditions.

For the purposes of this risk assessment, we have assumed that no activity and use limitations or deed restrictions would be placed on the Site that would prevent exposure of future receptors to Site soils located at any depth or would prevent the Site from being used for other purposes (such as a residence or childcare) where young children may be routinely present. Therefore, both current receptors (i.e., students, facility workers etc.) and potential future receptors (e.g., construction/utility workers, future residents) were assumed to have an exposure to COPCs in surface and subsurface soil at any depth under future scenarios. As indicated on previous sections, a deed notice, as part of the EPA components of the work, will be applied to the Site given the use of an encapsulant on concrete surfaces, a concrete cap overlying soils in some areas, and the use of low occupancy criteria in one select area.

As previously mentioned, groundwater was excluded as a medium of concern from the risk assessment because it has not been impacted by the Site release. Vapor intrusion impacts are also considered unlikely given that groundwater is not impacted by the release and that highly volatile constituents are not present in soil. Therefore, vapor intrusion into future potential buildings is not considered to be a complete transport mechanism.

4.2.3 Soil and Groundwater Classification and Applicable Method 1 Standards

This section identifies and documents the soil and groundwater categories applicable to the Site, as described in 310 CMR 40.0930. Categories of soil and groundwater have been established by MassDEP for use in the characterization of risk posed by disposal sites (310 CMR 40.0930). The current and future use of soil and groundwater determines their applicable categories. These categories are used, in turn, to identify applicable Method 1 soil and/or groundwater standards that are used to evaluate risk.

4.2.3.1 Soil

The MCP specifies three soil categories (S-1, S-2, and S-3), based on the frequency and intensity of exposure and the anticipated presence of children. Category S-1 soil represents the highest potential for exposure because it assumes the unrestricted use of the soil (i.e., residential). Category S-3 soil represents the lowest potential for exposure, as it assumes that the soil is inaccessible.

As previously mentioned, the Site currently is located on the UMass Campus. The area that encompasses the Site is used for student housing and is comprised primarily of dormitories and dining halls. The nearest human receptors are student residents living and visiting at the Site.

Because the Site is currently located on a university campus, and includes dormitory housing for undergraduate students, children are not anticipated to be routinely present. Given that the Site is mostly hardscaping (i.e., pavement, buildings) that UMass maintains, it is unlikely that students or other receptors would engage in high intensity activities such as digging or playing in Site soils. Therefore, accessible soils (0 to 3 ft bgs) at the Site are classified as S-2 under current conditions while potentially accessible soils (3 to 15 ft bgs) and isolated soils (greater than 15 ft bgs) are currently classified as S-3.

However, no deed restrictions restricting access to soils within the Site were assumed for the risk characterization. Thus, under the hypothetical assumption that this area could be redeveloped for future residential use, all Site soil located between 0 and 15 ft bgs is classified as S-1 under future conditions. Soils located at depths below 15 ft bgs are considered to be isolated and as such, are classified as S-3 under both current and future conditions.

4.2.3.2 Groundwater

MassDEP has established three categories for groundwater, which may apply to a specified volume of groundwater at a Site or to an aquifer taken as a whole. These groundwater categories were established to identify groundwater associated with the following three distinct types of exposures:

- GW-1 applies to groundwater assumed to be a potential source of drinking water.
- GW-2 applies to groundwater considered to be a potential source of vapors that could migrate through the subsurface and concentrate in indoor air of onsite buildings.
- GW-3 applies to groundwater that is assumed to discharge to surface water.

Groundwater beneath the Site is not classified as GW-1 because the Site does not lie within a high-yield potentially productive aquifer as defined by the MassDEP. Additionally, Site groundwater is not within a Zone II or an Immediate Wellhead Protection Area (IWPA) for a public water supply, Zone A of a Class A Surface Water Body used as a public water supply, or an area designated by a municipality specifically for the protection of groundwater quality to ensure its availability for use as a source of potable water.

Groundwater beneath the Site was not encountered to the maximum depth of excavation (4 feet, 9 inches); however, groundwater is conservatively assumed to be located at a depth less than 15 ft bgs and occupied buildings are present at the Site. Therefore, groundwater is classified as GW-2 under current and future conditions, as defined by the MCP. Consistent with the conceptual site model, groundwater is not expected to be impacted by the PCB release, and therefore is unlikely to serve as a source of vapors to current or future buildings.

All groundwater in the Commonwealth is classified as GW-3, which assumes that site groundwater will ultimately migrate and discharge to a surface water body. The nearest surface water body to the Site is Campus Pond, located approximately 0.4 miles north of the Site. Therefore, groundwater at the Site is classified as GW-3.

4.2.3.3 Applicable Method 1 Soil and Groundwater Standards

Site soil is classified as S-2 and S-3 under current conditions and as S-1 and S-3 under future conditions. Groundwater within the Site is classified as GW-2 and GW-3 under both current and future conditions. Applicable Method 1 soil standards therefore include:

S-1/GW-2	S-2/GW-2	S-3/GW-2
S-1/GW-3	S-2/GW-3	S-3/GW-3

As discussed, groundwater is not a medium of concern; therefore, Method 1 standards for groundwater were not identified. Soil exposure point concentrations, discussed in the following section, are compared to Method 1 soil standards in the following section. In order to streamline the risk assessment, the most conservative (i.e., lowest) set of soil standards (S-1/GW-2 and S-1/GW-3) were used to evaluate risk.

4.2.4 Exposure Point Concentrations

COPCs in soil are total PCBs. As previously mentioned, removal of soils exhibiting concentrations of PCBs at various depths throughout the Site followed by confirmatory sampling of soils left in place was conducted in May through August 2010. The data set used to calculate the EPCs for soil exposure is comprised of the post-remediation confirmatory data and samples from non-excavated areas, as summarized on Table 4-1. Summary statistics for the 1,011 soil samples used in the Method 1 RC are provided on Table 4-2.

No Hot Spots (as defined in the MCP) have been identified at the Site because: 1) receptors have an equal likelihood of being exposed to soil in any portion of the Site; 2) concentrations of PCBs were not 100 times greater in any one discrete area of the Site; and 3) Hot Spots can not be created as a result of remediation (MassDEP Q&A, 1993-2009; http://www.mass.gov/dep/cleanup/laws/mastqa.htm).

For the purposes of this Method 1 RC, the 95th Upper Confidence Limit of the mean concentration (95% UCL) of total PCBs in soils 0 to 15 ft bgs was applied as the EPC for the Site. Although current exposure is assumed limited to unpaved soils from 0 to 3 ft bgs, using analytical results from the 0 to 15 ft bgs interval is a more conservative approach that addresses both current and future exposure scenarios, because it includes samples with higher concentrations of total PCBs. (As discussed, all soils with PCB concentrations greater than 1 mg/kg were either located at depths greater than 3 feet bgs or covered by concrete). Use of data from soil samples 0-15 feet bgs therefore does not underestimate concentrations of PCBs in surface soil. The 95% UCL was calculated using USEPA's ProUCL software, version 4.1.00 (USEPA, 2011). The ProUCL results are presented on Table 4-3. Statistics were based on both detected and non-detect (i.e., censored) results, using the Kaplan-Meier statistical approach, as recommended by EPA.

Use of the 95% UCL as the EPC conservatively estimates average soil exposures at the Site. The 95% UCL is an upper-bound estimate of the mean concentration that takes into account variability among sample results. PCBs were detected in approximately one-half of all soil samples. Of the detected concentrations, results were generally consistent among soil samples, although there was a small fraction of results with relatively higher concentrations (i.e., between 1 and 23 mg/kg). The fact that the 95% UCL (0.38 mg/kg) is only slightly higher than the mean (0.32 mg/kg) suggests that there is little uncertainty in estimating the true mean.

4.2.5 Risk Characterization

The Method 1 RC compares the Site EPCs to promulgated MCP Method 1 standards. As shown in Table 4-4, the EPC for total PCBs in soil (0.38 mg/kg) is well below the Method 1 S-1/GW-2 and S-1/GW-3 standards of 2 mg/kg (the most stringent values among all applicable standards). Therefore, even assuming unrestricted future use of the Site, a level of No Significant Risk of harm to human health, public welfare, and the environment has been achieved under current and reasonably foreseeable future conditions.

4.2.6 Uncertainty Analysis

This risk assessment is based on a number of assumptions, the majority of which are intended to be protective of human health. Site-specific uncertainties can include incomplete delineation of the Site or sample results that do not adequately reflect site conditions.

Over 1,100 soil samples have been collected at and within the vicinity of the Site, data from which were used to define the limits of excavation and delineate site boundaries. Of these, 1,011 are considered to be representative of current site conditions. Soil samples were analyzed for total PCBs. The number of soil samples and the type of analyses are considered appropriate for the release given the type of release (from caulking to adjacent materials).

Most assumptions incorporated into this risk assessment were inherently conservative. Specifically, the Method 1 standards are derived to be protective of human health. This evaluation considered a full range of exposures and the most sensitive of potential exposure populations (i.e., residential). Included in the exposure point concentration were non-detect results for approximately one-half of all soil samples used in the risk characterization; these censored results were included in calculation of the 95% UCL, which conservatively assumes that even if a compound was not detected in the soil sample, it was still present at some concentration less than the detection limit. Lastly, the EPC for PCBs in soil was below the most stringent of the applicable standards, which are protective of residential exposures.

4.3 CHARACTERIZATION OF RISK TO SAFETY

The risk of harm to safety is evaluated by comparing site conditions to applicable or suitably analogous safety standards (310 CMR 40.0960(2)). For the Site, no applicable or suitably analogous safety standards were identified.

The MCP in 310 CMR 40.0960 identifies several additional criteria that need to be considered in evaluation of safety, including:

- The presence of rusted or corroded drums or containers, open pits, lagoons or other dangerous structures (310 CMR 40.0960(3)(a)). None of these structures was observed on the Site.
- The threat of fire or explosion (310 CMR 40.0960(3)(b)). No conditions were identified that would pose such a threat.
- Uncontained material that exhibits the characteristics of corrosivity, reactivity, or flammability as described in 310 CMR 40.0347. These materials were not observed at the time of the site visit, nor are they likely to be present, given the nature of the known or potential releases at the Site.

Based upon the above evaluation, a condition of No Significant Risk of harm to safety exists for the Site, as no threat of physical harm or bodily injury to people related to the COPCs was observed within the Site or within the surrounding area (310 CMR 40.0960).

4.4 CONCLUSIONS OF THE RISK CHARACTERIZATION

The Method 1 RC demonstrates that a condition of No Significant Risk (NSR) to human health, public welfare, safety, and the environment exists at the Site. No EPC exceeds the applicable Method 1 standards. The public safety evaluation concludes that NSR to public safety is present.

5. CLASS A-2 RAO STATEMENT

This section provides the information required to support an RAO described in 310 CMR 40.1056, including a demonstration that a condition that No Significant Risk exists, that sources have been eliminated or controlled, and that completion of additional response actions to achieve or approach background are not required.

5.1 RAO CATEGORY AND SITE BOUNDARIES

This RAO Statement applies to the entire Site. As documented herein, a Class A-2 RAO Statement is applicable because: 1) a Permanent Solution has been achieved; 2) the level of OHM in the environment has not been reduced to background; and 3) a Notice of AUL is not required to maintain a condition of No Significant Risk.

The disposal site boundary defined for MassDEP RTN 1-17872 was delineated during the RAM activities as being limited to the immediate area surrounding buildings and other hardscape areas impacted by PCB-containing caulking and within the Southwest Concourse revitalization project area. This area is shown on Figure 1-2. Within this area, the disposal site boundary extends vertically to the depths of soil excavations completed during the work (maximum of approximately 5 feet)

5.2 DEMONSTRATION OF NO SIGNIFICANT RISK

A Method 1 Risk Characterization was prepared to evaluate the degree of risk to human health, safety, public welfare, and the environment from PCBs remaining in soils following remedial actions. As presented in Section 4 of this report, the Method 1 Risk Characterization concludes that a condition of No Significant Risk has been achieved at the Site under both current and future unrestricted site activities and uses.

5.3 DEMONSTRATION THAT SOURCES ARE ELIMINATED OR CONTROLLED

To achieve a Class A RAO, all continuing sources of OHM which are resulting or are likely to result in an increase in concentrations of OHM in an environmental medium must be eliminated or controlled. Release conditions at the Site are attributable to releases of PCBs from caulking on concrete pads, retaining walls, stairs, and other structures. Removal of this caulking under an EPA-approved Remediation Plan, eliminated the source of PCBs, thereby eliminating the potential for future PCB impacts to soils with the Site.

5.4 FEASIBILITY OF ACHIEVING OR APPROACHING BACKGROUND

As presented in the Method 1 Risk Characterization, remedial actions consisting of removal of source material and the off-site disposal of impacted soils have resulted in achieving a condition of No Significant Risk at the Site, thus, the minimum performance standards for achieving a Permanent Solution have been met. However, the response actions did not result in achieving background conditions since detectable concentrations of PCBs remain in soils. As such, an evaluation must be conducted to determine whether or not the benefits of further risk reduction to achieve background, justify the additional costs for these activities. This evaluation, presented in the following sections, demonstrates that achieving background conditions for PCBs, the only COPC at the Site, is not feasible.

5.4.1 Definitions

From MassDEP Policy:

- *Background means those levels of oil and hazardous materials that would exist in the absence of the disposal site of concern.*

- *Background in soil for persistent contaminants located in areas classified as S-1 shall be considered approached if the exposure point concentration of each persistent contaminant is reduced by 50 % below the exposure point concentration present at No Significant Risk.*

Because PCBs would not exist in the local environment in the absence of the Site, the background concentration for PCBs in soils are considered non-detect. The reporting limit for PCB Aroclors reported by Method 8082, as specified in the revised CAM effective July 1, 2010 is 0.1 mg/kg; having been revised from the previous range of 0.050 – 0.070 mg/kg. Non-detectable levels of PCB Aroclors were reported in 532 of the 1011 soil samples representative of current, post-remediation conditions (approximately 50%). As presented in the Method 1 RC (refer to Section 4.0), the 95th Upper Confidence Limit of the mean concentration (95%UCL) of total PCBs in soils 0 to 15 ft bgs was applied as the exposure point concentration for the Site. Of the detected concentrations, results were generally consistent among soil samples, although there was a small fraction of results with relatively higher concentrations (i.e., between 1 and 23 mg/kg). The fact that the 95% UCL (0.38 mg/kg) is only slightly higher than the mean (0.32 mg/kg) suggests that there is little uncertainty in estimating the true mean.

Using a Method 1 approach, a condition of No Significant Risk has been achieved at the Site since the exposure point concentration is less than the most stringent S-1 soil standard equal to 2 mg/kg. Since the exposure point concentration is also below 1 mg/kg (or 50% below a level of No Significant Risk), remedial response actions have resulting in Site conditions which have approached background.

5.4.2 Feasibility Evaluation

In accordance with MassDEP Policy, remedial actions to achieve or approach background for certain compounds in certain environmental settings may be considered categorically infeasible if any one of four specific conditions are met. In this case, a condition of categorical infeasibility cannot be supported, since PCBs (which are considered persistent or non-degradable compounds), are located in soils with higher exposure potential (i.e., category S-1 soils, under future unrestricted site activities and uses). As such, a site-specific evaluation of the feasibility to achieve or approach background has been conducted in a manner consistent with published policy (MassDEP, 2004) and is presented in the following paragraphs.

The site-specific feasibility evaluation includes both a technological element and a cost-benefit element. Because achievement of background conditions is technologically feasible (i.e., all site soils could be removed until verification sampling confirms that all soil samples are reported as non-detect for PCBs), this evaluation consists of a cost-benefit analysis to determine the feasibility of achieving background conditions.

It is considered feasible to conduct remedial actions if the cost to achieve background is ≤20% of the cost incurred to remediate to a level of No Significant Risk. Incremental costs greater than 20% of the cost incurred to achieve no significant risk are considered "substantial and disproportionate" to the incremental benefit of risk reduction and shall lead to a conclusion of infeasibility.

Multiple contractors were involved with the completion of the PCB remediation activities. According to discussions with the University, the cost of this project was in the million dollar range.

Based on the data, about one-half of the post-removal soil samples detected PCBs above the laboratory reporting limits and therefore would need to be removed to achieve background. Given that the concourse has been replaced, this would involve significant removal of newly-placed concrete, concrete pads, pavement, landscape planters, trees, etc. just to access the soils. Conservatively assuming half the area would need to be excavated, this results in additional removals over 2.5 acres. Given that significant volumes of soils were removed to achieve the $\leq$ 1 mg/kg cleanup level, similar to additional volumes of soils would likely be removed to reach non-detect levels for PCBs. As such, it would be anticipated that costs to achieve non-detect would be greater them 20% of the already significant costs incurred to date to reach a condition of No Significant Risk. Therefore, the cost is considered "substantial and disproportionate" to the incremental benefit, and is therefore concluded to be infeasible to achieve background conditions in site soils.

5.5 RELATIONSHIP TO OTHER RESPONSE ACTION OUTCOMES

To date, multiple RTNs have been assigned to release conditions occurring at the UMass Amherst Campus. No other RTNs have been assigned to the portion of the UMass Amherst Campus for which RTN 1-17872 applies. This Class A-2 RAO Statement will close out response actions for the Site under RTN 1-17872, for which no previous RAO Statements have been submitted.

5.6 POST-CLOSURE OPERATION, MAINTENANCE, AND/OR MONITORING

No operation, maintenance, or monitoring will be required to confirm or maintain those conditions at the Site upon which this RAO Statement is based. A Permanent Solution, as defined in 310 CMR 40.1006, has been achieved at the Site under the criteria for a Class A-2 RAO Statement, and therefore is not contingent on any post-closure operation, maintenance, and/or monitoring.

6. LICENSED SITE PROFESSIONAL OPINION AND CERTIFICATION OF SUBMITTAL

It is the opinion of Licensed Site Professional (LSP) of record, Jeffrey A. Hamel, LEP, LSP (#1278), that the RAM activities subject to this RAM Completion Report were conducted in general conformance with the written RAM Plan submitted to MassDEP in June 2010 (W&C, 2010a). Submittal of the second RAM Status Report due in April 2011 was inadvertently overlooked during preparation of this RAM Completion Report and RAO Statement submittal. During the reporting period from October 2010 to April 2011, no intrusive site investigation or remediation activities were conducted, rather activities included off-site disposal of remediation wastes (refer to Section 2.7), as well as reduction, validation, and evaluation of analytical data as part of the project and MCP reporting requirements.

It is also the opinion of Jeffrey Hamel, that based on the results of the environmental investigations conducted to date and the risk posed by constituents remaining at the Site, a Class A-2 RAO Statement is appropriate for the Site. The electronic seal and signature of Jeffrey Hamel, are provided in Sections E and G, respectively of the RAM Transmittal Form BWSC106 and the RAO Statement Transmittal Form BWSC104, provided via electronic transmission with this report.

The University of Massachusetts has undertaken the activities subject to this RAM Completion Report and Class A-2 RAO Statement. Theresa Bechta, Assistant Director for Environmental and Hazardous Material Management Services, is serving as the contact for the University. The electronic certification of Theresa Bechta, is provided in Sections I and K, respectively, of Transmittal Form BWSC106 and 104.

7. CONCLUSIONS

Woodard & Curran (W&C) has prepared this Release Abatement Measure (RAM) Completion Report and Class A-2 Response Action Outcome (RAO) Statement on behalf of the University of Massachusetts (UMass), for the disposal site identified by the Massachusetts Department of Environmental Protection (MassDEP) Release Tracking Number (RTN) 1-17872 (the "Site"). The Site is located at a portion of the UMass campus in Amherst, Massachusetts, identified as the Southwest Residential Area. The Site consists of an area of soils impacted by polychlorinated biphenyls (PCBs), released from caulking on concrete pads, walls, and other ground surface structures.

Soil removal activities were conducted at the Site in accordance with a RAM Plan submitted to the Massachusetts Department of Environmental Protection in June 2010. With limited exceptions, soils at the Site containing PCB concentrations above the cleanup goal of 1 milligram per kilogram established by the Environmental Protection Agency at 40 CFR 761 were removed from the Site in accordance with the RAM Plan. In addition, PCB remediation activities associated with caulking removal, concrete remediation, granite decontamination, as well as the soil remediation, were conducted in accordance with an approval from the EPA under 40 CFR 761.

A review of the data collected during implementation of the RAM Plan indicated that the data are of sufficient quality for use in rendering a Waste Site Cleanup Opinion, the data quality objectives for the project have been met, and the post-excavation soil data are adequately representative of current site conditions.

A Method 1 Risk Characterization was prepared as part of this Class A-2 RAO Statement to evaluate the potential risks to human health, safety, public welfare, and the environment from contaminants remaining at the Site. The Method 1 Risk Characterization concluded that a condition of No Significant Risk exists at the Site under current and reasonably foreseeable future unrestricted site activities and uses.

An evaluation conducted to determine the feasibility of achieving background levels of PCBs at the Site found that it would be infeasible to remediate the Site to background conditions. While actions would be technologically feasible, a cost-benefit analysis found that the cost would be substantial and disproportionate to the incremental benefit, and it is considered infeasible to achieve background conditions at the Site.

Submittal of a Class A-2 RAO Statement is applicable because: 1) a Permanent Solution has been achieved; 2) the level of oil and/or hazardous material in the environment has not been reduced to background; and 3) a Notice of AUL is not necessary to maintain a condition of No Significant Risk. No additional response actions are necessary to maintain a condition of No Significant Risk, and no Operation, Maintenance, or Monitoring activities are required to confirm or maintain those conditions at the Site upon which this RAO is based.

8. LIMITATIONS

The activities described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or limited, is implied. These services were performed consistent with the agreement of our client. The conclusions presented in this Report were based upon the services described and not on scientific tasks or procedures beyond the scope of described services or time or budgetary constraints. Any statement or opinion contained in this report prepared by W&C shall not be construed to create any warranty or representation that the property is free of pollution or complies with any or all applicable regulatory or statutory requirements; or was made to check on the compliance of present or past owners of the Site with federal, state, or local laws and regulations. Woodard & Curran shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld or not fully disclosed at the time the evaluation was performed.

Results of the activities contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do no warrant the accuracy of information supplied by others or the use of segregated portions of this report.

This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

9. REFERENCES

Massachusetts Department of Environmental Protection (MassDEP), 1995. *Guidance for Disposal Site Risk Characterization - In Support of the Massachusetts Contingency Plan, Interim Final Policy*. WSC/ORS 95-141. Bureau of Waste Site Cleanup. Boston, Massachusetts. July.

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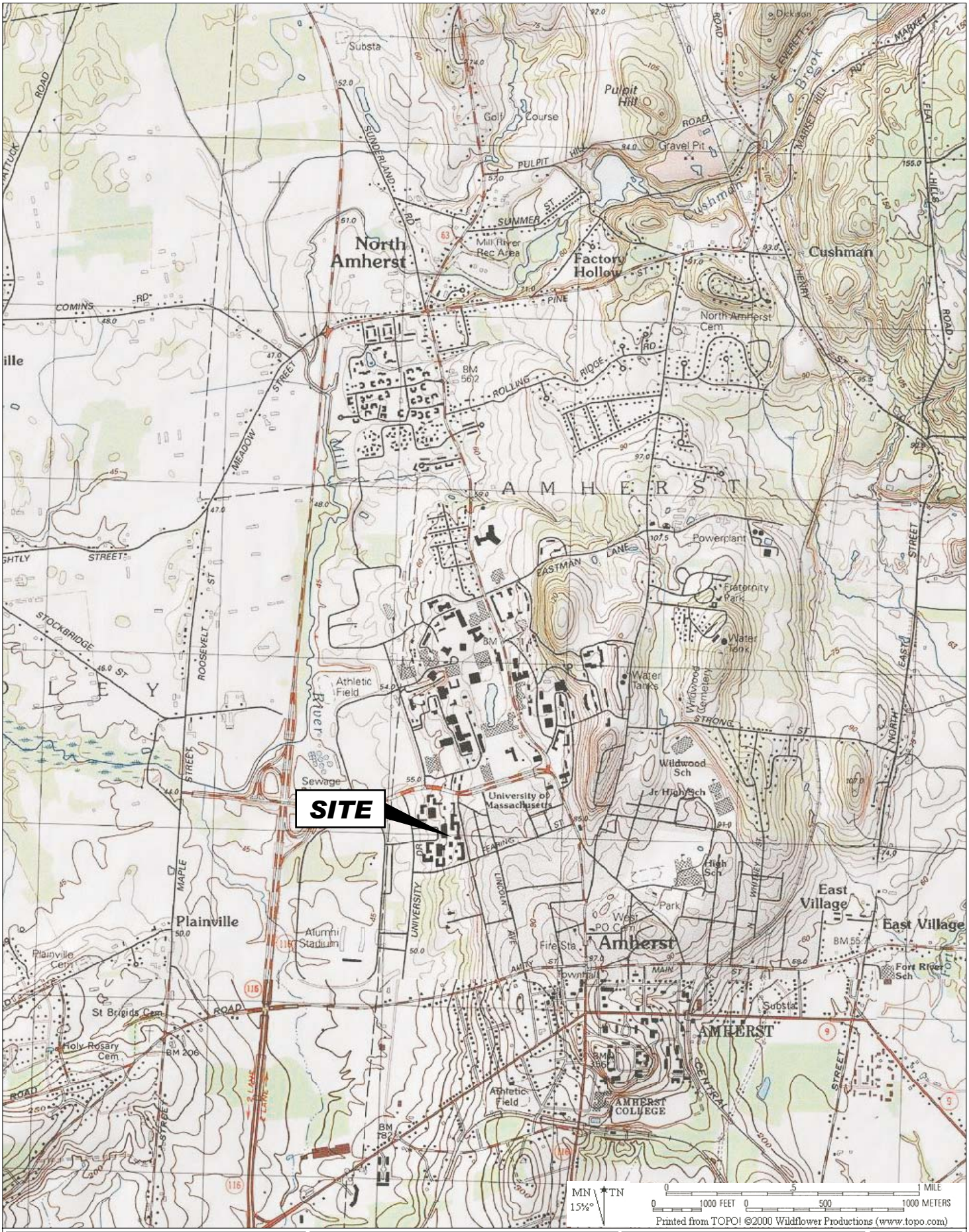
Woodard & Curran, Inc. (W&C). 2011. PCB Completion Report, University of Massachusetts, Southwest Concourse Amherst, Massachusetts. February.



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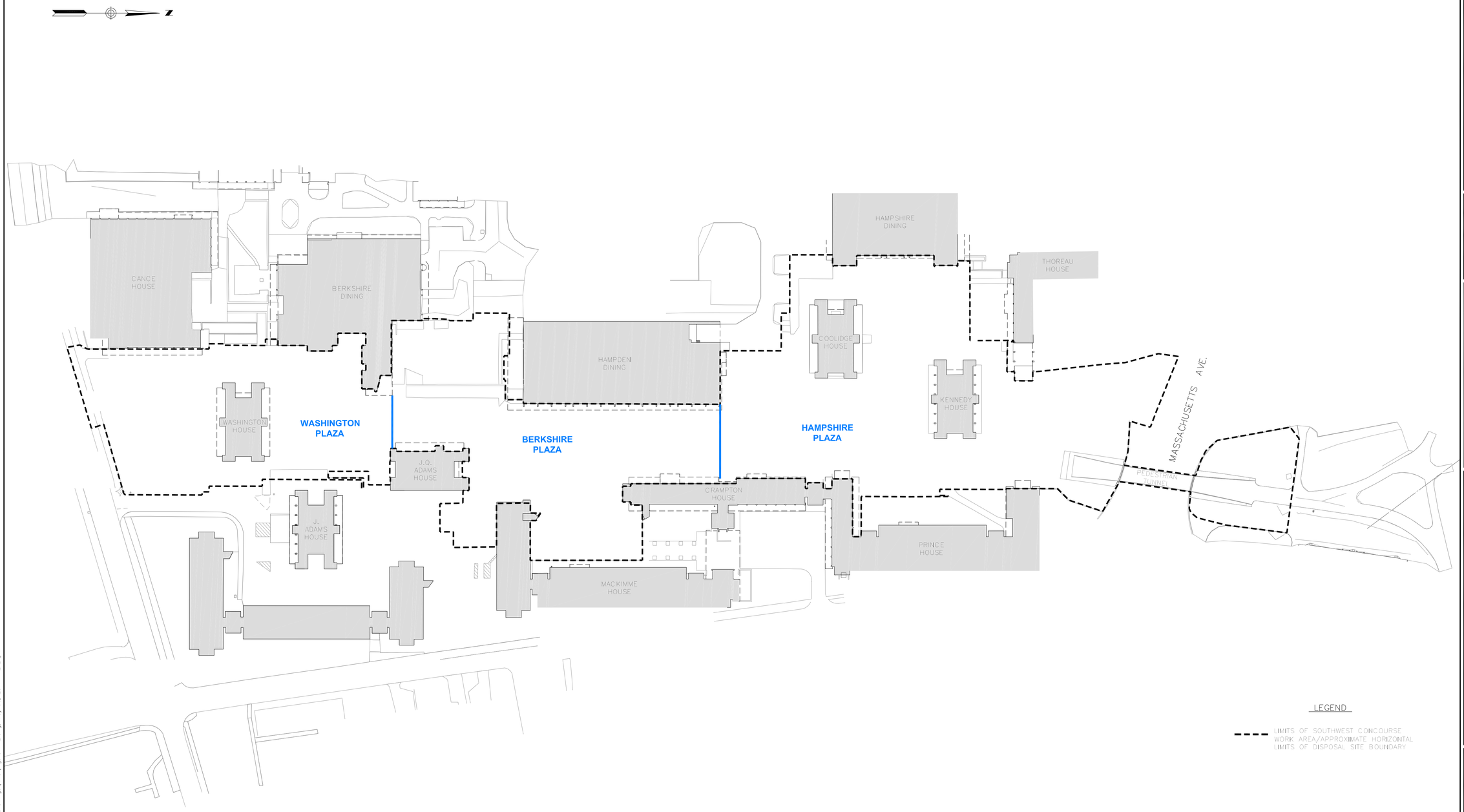
UMASS AMHERST
SOUTHWEST CONCOURSE
AMHERST, MASSACHUSETTS

SCALE: AS NOTED	JOB NO.: 223505
DATE: MAY 2011	FILE: Figure 1-1.cnv

SITE LOCUS

DES.BY:	EVR
DR.BY:	EVR
CK.BY:	ALW

1-1



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REV.	DESCRIPTION	DESIGNED BY: GJF	CHECKED BY: JAH	DATE
		DRAWN BY: EVR	Figure 1-2.dwg	

SITE PLAN

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASSACHUSETTS

SOUTHWEST CONCOURSE
PCB REMEDIATION
RAO

JOB NO.: 223505
DATE: MAY 2011
SCALE: AS NOTED
SHEET: OF

FIGURE 1-2

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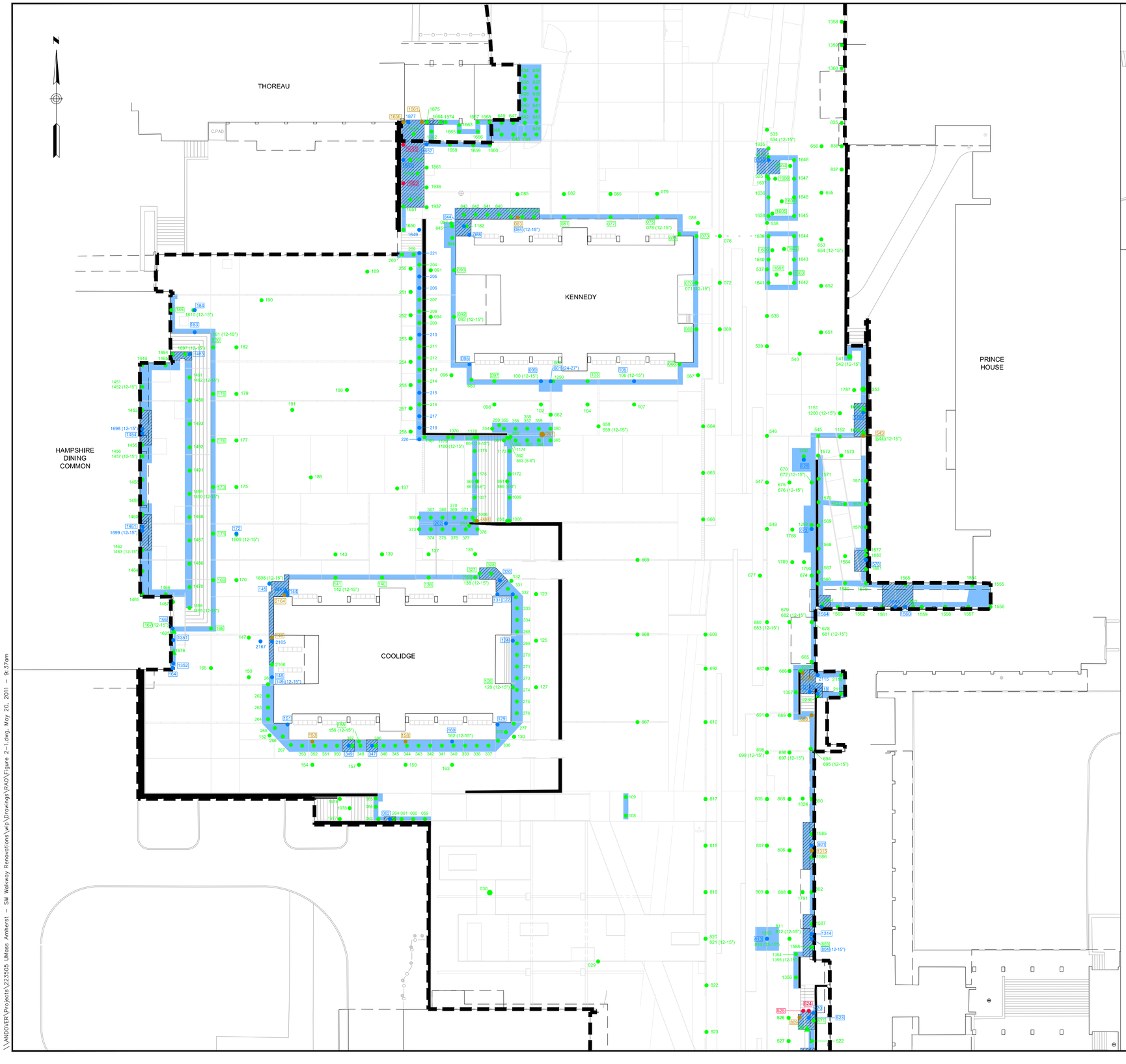

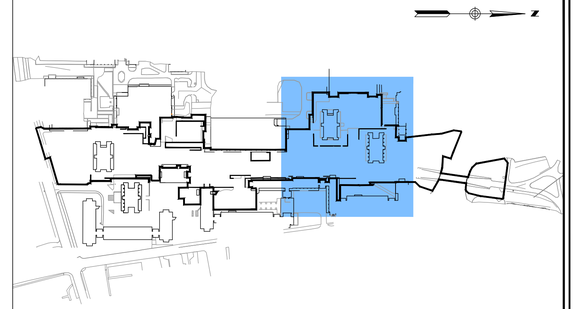

LEGEND

- CONCRETE RETAINING WALL
- LIMITS OF SOUTHWEST CONCOURSE WORK AREA/APPROXIMATE HORIZONTAL LIMITS OF DISPOSAL SITE BOUNDARY
- 190 ● SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs ≤ 1.0 mg/kg
- 152 ● SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs > 1 AND < 10 mg/kg
- 543 ● SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs > 10 AND < 50 mg/kg
- 153 ● SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs ≥ 50 mg/kg
- 1625 ▲ CONCRETE SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs ≤ 1.0 mg/kg
- 2247 ▲ CONCRETE SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs > 1 AND < 10 mg/kg
- 153 SOILS REPRESENTED BY SAMPLE LOCATION HAVE BEEN EXCAVATED FOLLOWING SAMPLE COLLECTION
- AREA OF SOIL REMOVAL TO A DEPTH OF 1 FOOT
- SUBSEQUENT SOIL EXCAVATION COMPLETED FOLLOWING INITIAL SOIL REMOVAL

NOTES:

1. SOIL SAMPLES COLLECTED OUTSIDE PERIMETER EXCAVATION AREAS COLLECTED FROM 0–3 INCHES BELOW GROUND SURFACE (BGS) EXCEPT WHERE INDICATED IN PARENTHESIS.
2. SOIL SAMPLES WITHIN PERIMETER EXCAVATIONS COLLECTED FROM 0–3 INCHES BELOW BASE OF EXCAVATION EXCEPT WHERE INDICATED. DEPTHS INDICATED REPRESENT DEPTH BELOW BOTTOM OF INITIAL ONE FOOT EXCAVATION.

0 20 40
SCALE IN FEET

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REV	DESCRIPTION	DATE
DESIGNED BY:	ALW	
DRAWN BY:	EVR	
CHECKED BY:	JAH	
Figure 2-1.dwg		

SOIL CHARACTERIZATION AND VERIFICATION SAMPLES AT HAMPSHIRE PLAZA

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASSACHUSETTS

SOUTHWEST CONCOURSE
PCB REMEDIATION
RAO

JOB NO.: 223505
DATE: MAY 2011
SCALE: AS NOTED
SHEET: OF

FIGURE 2-1

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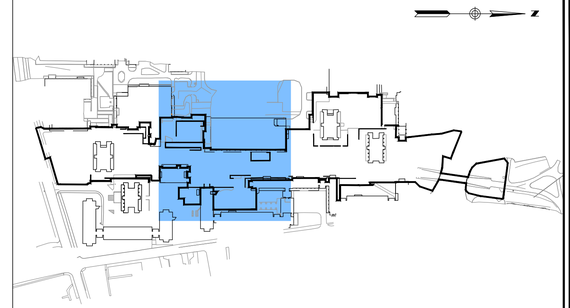
HAMPDEN
DINING HALL

CRAMPTON
HOUSE

MACKIMMIE
HOUSE

J.Q. ADAMS
HOUSE

BERKSHIRE
DINING



LEGEND

- CONCRETE RETAINING WALL
- LIMITS OF SOUTHWEST CONCOURSE WORK AREA/APPROXIMATE HORIZONTAL LIMITS OF DISPOSAL SITE BOUNDARY
- 484 SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs ≤ 1.0 mg/kg
- 491 SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs > 1 AND < 10 mg/kg
- 488 SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs > 10 AND < 50 mg/kg
- 520 SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs ≥ 50 mg/kg
- 981 CONCRETE SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs ≤ 1.0 mg/kg
- 520 SOILS REPRESENTED BY SAMPLE LOCATION HAVE BEEN EXCAVATED FOLLOWING SAMPLE COLLECTION
- AREA OF SOIL REMOVAL TO A DEPTH OF 1 FOOT
- SUBSEQUENT SOIL EXCAVATION COMPLETED FOLLOWING INITIAL SOIL REMOVAL

NOTES:

1. SOIL SAMPLES COLLECTED OUTSIDE PERIMETER EXCAVATION AREAS COLLECTED FROM 0–3 INCHES BELOW GROUND SURFACE (BGS) EXCEPT WHERE INDICATED IN PARENTHESIS.
2. SOIL SAMPLES WITHIN PERIMETER EXCAVATIONS COLLECTED FROM 0–3 INCHES BELOW BASE OF EXCAVATION EXCEPT WHERE INDICATED. DEPTHS INDICATED REPRESENT DEPTH BELOW BOTTOM OF INITIAL ONE FOOT EXCAVATION.

0 20 40
SCALE IN FEET

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REV	DESCRIPTION	DATE

DESIGNED BY: ALW
DRAWN BY: EVR
CHECKED BY: JAH
Figure 2-2.dwg

SOIL CHARACTERIZATION AND VERIFICATION SAMPLES AT BERKSHIRE PLAZA

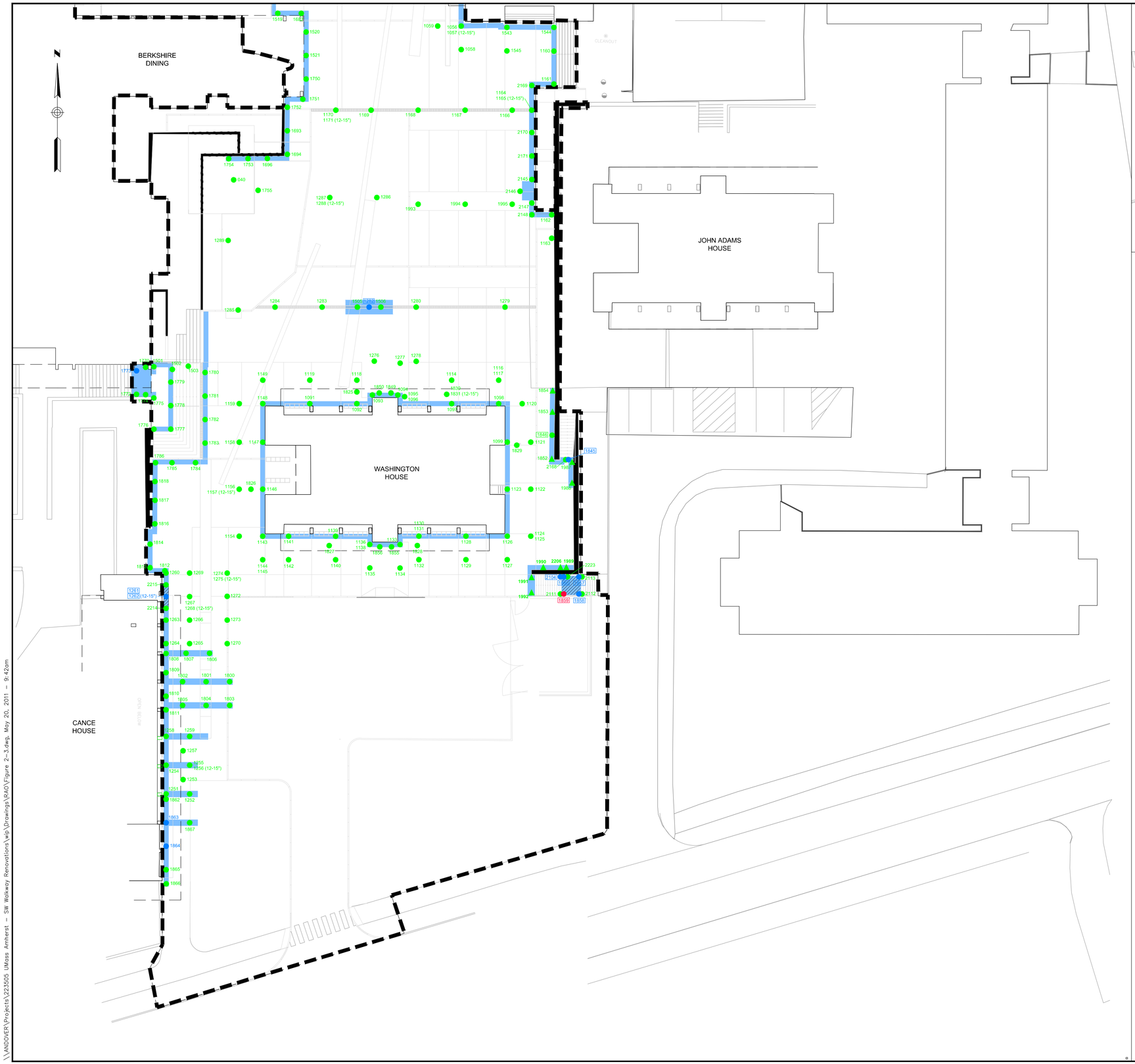
UNIVERSITY OF MASSACHUSETTS
AMHERST, MASSACHUSETTS

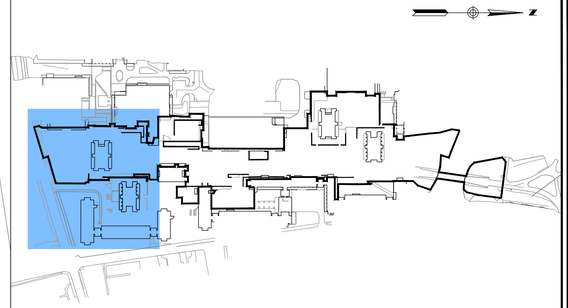
SOUTHWEST CONCOURSE
PCB REMEDIATION
RAO

JOB NO.: 223505
DATE: MAY 2011
SCALE: AS NOTED
SHEET: OF

FIGURE 2-2

\\ANDOVER\Projects\223505 UMass Amherst - SW Walkway Renovations\wip\Drawings\RAO\Figure 2-2.dwg, May 20, 2011 - 9:39am





LEGEND

- CONCRETE RETAINING WALL
- LIMITS OF SOUTHWEST CONCOURSE WORK AREA/APPROXIMATE HORIZONTAL LIMITS OF DISPOSAL SITE BOUNDARY
- 040 SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs ≤ 1.0 mg/kg
- 1282 SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs > 1 AND < 10 mg/kg
- 1859 SOIL SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs ≥ 50 mg/kg
- 1990 CONCRETE SAMPLE LOCATION AND IDENTIFIER TOTAL PCBs ≤ 1.0 mg/kg
- [1282] SOILS REPRESENTED BY SAMPLE LOCATION HAVE BEEN EXCAVATED FOLLOWING SAMPLE COLLECTION
- AREA OF SOIL REMOVAL TO A DEPTH OF 1 FOOT
- SUBSEQUENT SOIL EXCAVATION COMPLETED FOLLOWING INITIAL SOIL REMOVAL

NOTES:

1. SOIL SAMPLES COLLECTED OUTSIDE PERIMETER EXCAVATION AREAS COLLECTED FROM 0-3 INCHES BELOW GROUND SURFACE (BGS) EXCEPT WHERE INDICATED IN PARENTHESIS.
2. SOIL SAMPLES WITHIN PERIMETER EXCAVATIONS COLLECTED FROM 0-3 INCHES BELOW BASE OF EXCAVATION EXCEPT WHERE INDICATED. DEPTHS INDICATED REPRESENT DEPTH BELOW BOTTOM OF INITIAL ONE FOOT EXCAVATION.

0 20 40
SCALE IN FEET

35 NEW ENGLAND BUSINESS CENTER
ANDOVER, MASSACHUSETTS 01810
866.702.6371 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

REV.	DESCRIPTION	DATE
DRAWN BY:	EVR	
DESIGNED BY:	ALW	
CHECKED BY:	Figure 2-3.dwg	JAH

SOIL CHARACTERIZATION AND VERIFICATION SAMPLES AT WASHINGTON PLAZA

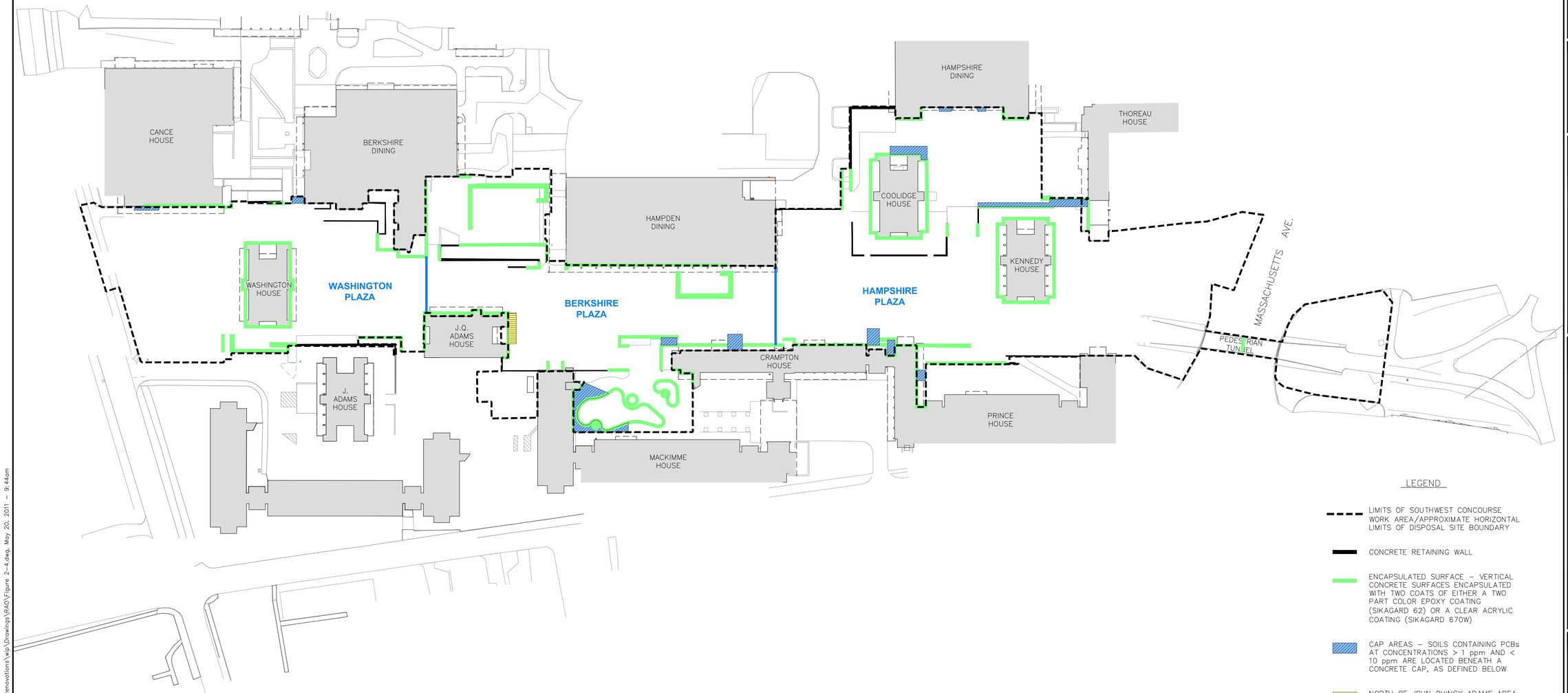
UNIVERSITY OF MASSACHUSETTS
AMHERST, MASSACHUSETTS

SOUTHWEST CONCOURSE
PCB REMEDIATION
RAO

JOB NO.:	223505
DATE:	MAY 2011
SCALE:	AS NOTED
SHEET:	OF

FIGURE 2-3

\\ANDOVER\Projects\223505 UMass Amherst - SW Walkway Renovations\wip\Drawings\RAO\Figure 2-3.dwg, May 20, 2011 - 9:42am



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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

REV	DESCRIPTION	DATE
DESIGNED BY:	ALW	
DRAWN BY:	EVR	
CHECKED BY:	JAH	
Figure 2-4.dwg		

ENCAPSULATED SURFACES AND CONCRETE CAP AREAS

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASSACHUSETTS

SOUTHWEST CONCOURSE
PCB REMEDIATION
RAO

JOB NO.: 223505
DATE: MAY 2011
SCALE: AS NOTED
SHEET: OF

FIGURE 2-4

\\ANDOVER\Projects\223505 UMass Amherst - SW Walkway Renovations\wip\Drawings\RAO\Figure 2-4.dwg, May 20, 2011 - 9:44am

Table 4-2

Statistical Summary of Soil Analytical Results[1]
UMass Southwest Concourse - Amherst, Massachusetts

Constituent	Frequency of Detection	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Location of Maximum Detected Concentration	Mean Concentration[2] (mg/kg)	95% Upper Confidence Limit (UCL) of the Mean[2] (mg/kg)
Total PCBs	481 / 1011	0.091	23	SWC-VBS-2141	0.32	0.38

Notes:
mg/kg = Milligrams per kilogram.
1. Summary statistics are based on the soil analytical data presented on Table 4-1.
2. Mean and 95% UCL calculated using the EPA ProUCL Version 4.1.00 software (2011), Kaplan-Meier approach for non-detects (see Table 4-4).

Table 4-3
EPA ProUCL Version 4.1.00 Output for Soil Analytical Results
UMass Southwest Concourse - Amherst, Massachusetts

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

PCBs

General Statistics

Number of Valid Data	1011	Number of Detected Data	481
Number of Distinct Detected Data	111	Number of Non-Detect Data	530
		Percent Non-Detects	52.42%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.091	Minimum Detected	-2.397
Maximum Detected	23	Maximum Detected	3.135
Mean of Detected	0.581	Mean of Detected	-1.109
SD of Detected	1.418	SD of Detected	0.842
Minimum Non-Detect	0.033	Minimum Non-Detect	-3.411
Maximum Non-Detect	0.14	Maximum Non-Detect	-1.966

Note: Data have multiple DLs - Use of KM Method is recommended
For all methods (except KM, DL/2, and ROS Methods),
Observations < Largest ND are treated as NDs

Number treated as Non-Detect	585
Number treated as Detected	426
Single DL Non-Detect Percentage	57.86%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.365	Lilliefors Test Statistic	0.0922
5% Lilliefors Critical Value	0.0404	5% Lilliefors Critical Value	0.0404
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.304	Mean	-2.074
SD	1.012	SD	1.093
95% DL/2 (t) UCL	0.356	95% H-Stat (DL/2) UCL	N/A
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.289
		SD in Log Scale	1.405
		Mean in Original Scale	0.3
		SD in Original Scale	1.013
		95% t UCL	0.353
		95% Percentile Bootstrap UCL	0.355
		95% BCA Bootstrap UCL	0.374
		95% H-UCL	N/A

Table 4-3
EPA ProUCL Version 4.1.00 Output for Soil Analytical Results
UMass Southwest Concourse - Amherst, Massachusetts

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.014
Theta Star	0.573
nu star	975
A-D Test Statistic	2.079E+28
5% A-D Critical Value	0.785
K-S Test Statistic	0.785
5% K-S Critical Value	0.0426
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000001
Maximum	23
Mean	0.276
Median	0.000001
SD	1.019
k star	0.122
Theta star	2.258
Nu star	247.3
AppChi2	211.9
95% Gamma Approximate UCL	0.322
95% Adjusted Gamma UCL	0.322

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	**0.324**
SD	1.007
SE of Mean	0.0317
95% KM (t) UCL	0.376
95% KM (z) UCL	0.376
95% KM (jackknife) UCL	0.374
95% KM (bootstrap t) UCL	0.402
95% KM (BCA) UCL	0.387
95% KM (Percentile Bootstrap) UCL	0.38
95% KM (Chebyshev) UCL	0.462
97.5% KM (Chebyshev) UCL	0.522
99% KM (Chebyshev) UCL	0.64
Potential UCLs to Use	
95% KM (t) UCL	0.376
95% KM (% Bootstrap) UCL	**0.38**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Table 4-4
Comparison of Soil Exposure Point Concentrations to Method 1 Soil Standards
UMass Southwest Concourse - Amherst, Massachusetts

Constituent	CAS Number	Exposure Point Concentration[1] (mg/kg)	Method 1 Soil Standards[2] S-1/GW-2 (mg/kg)	Method 1 Soil Standards[2] S-1/GW-3 (mg/kg)
Polychlorinated Biphenyls (PCBs)				
Total PCBs	1336-36-3	0.38	2	2

Notes:
mg/kg = Milligrams per kilogram.
UCL = Upper Concentration Limit

1. The Exposure Point Concentration is the 95th percentile upper confidence limit of the mean, based on soil samples collected between the 0 and 15 ft bgs depth interval. The 95th percentile upper confidence limit was calculated using USEPA's ProUCL software, version 4.1.00 (see Table 4-3).

2. Massachusetts Department of Environmental Protection (MassDEP) (2009). Massachusetts Contingency Plan (MCP), 310 CMR 40.0974(6)(a), Table 2, June. The most stringent standards applicable to the Site are presented.

APPENDIX A: TRANSMITTAL FORMS BWSC106 & BWSC104

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number: 1 - 17872

A. SITE LOCATION:

1. Site Name/Location Aid: UMASS SOUTHWEST RESIDENTIAL AREA

2. Street Address: MASS AVE. AND UNIVERSITY DR.

3. City/Town: AMHERST 4. ZIP Code: 010030000

5. UTM Coordinates: a. UTM N: 4698316 b. UTM E: 209445

☐ 6. Check here if a Tier Classification Submittal has been provided to DEP for this disposal site.
☐ a. Tier IA ☐ b. Tier IB ☐ c. Tier IC ☐ d. Tier II

7. If a Tier I Permit has been issued, provide Permit Number: _____

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of Initial RAM Plan (if previously submitted): _____ (mm/dd/yyyy)

☐ 2. Submit an **Initial Release Abatement Measure (RAM) Plan**.

☐ a. Check here if the RAM is being conducted as part of the construction of a permanent structure. If checked, you must specify what type of permanent structure is to be erected in or in the immediate vicinity of the area where the RAM is to be conducted.

b. Specify type of permanent structure: (check all that apply) ☐ i. School ☐ ii. Residential ☐ iii. Commercial ☐ iv. Industrial ☐ v. Other Specify: _____

☐ 3. Submit a **Modified RAM Plan** of a previously submitted RAM Plan.

☐ 4. Submit a **RAM Status Report**.

☐ 5. Submit a **Remedial Monitoring Report**. (This report can only be submitted through eDEP, concurrent with a RAM Status Report.)

a. Type of Report: (check one) ☐ i. Initial Report ☐ ii. Interim Report ☐ iii. Final Report

b. Number of Remedial Systems and/or Monitoring Programs: _____

A separate BWSC106A, RAM Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.

☑ 6. Submit a **RAM Completion Statement**.

☐ 7. Submit a **Revised RAM Completion Statement**.

8. Provide Additional RTNs:

☐ a. Check here if this RAM Submittal covers additional Release Tracking Numbers (RTNs). RTNs that have been previously linked to a Primary Tier Classified RTN do not need to be listed here. This section is intended to allow a RAM to cover more than one unclassified RTN and not show permanent linkage to a Primary Tier Classified RTN.

b. Provide the additional Release Tracking Number(s) covered by this RAM Submittal. ☐ - _____ ☐ - _____

(All sections of this transmittal form must be filled out unless otherwise noted above)

C. RELEASE OR THREAT OF RELEASE CONDITIONS THAT WARRANT RAM:

1. Identify Media Impacted and Receptors Affected: (check all that apply)

☐ a. Air ☐ b. Basement ☐ c. Critical Exposure Pathway ☐ d. Groundwater ☐ e. Residence

☐ f. Paved Surface ☐ g. Private Well ☐ h. Public Water Supply ☐ i. School ☐ j. Sediments

☑ k. Soil ☐ l. Storm Drain ☐ m. Surface Water ☐ n. Unknown ☐ o. Wetland ☐ p. Zone 2

☐ q. Others Specify: _____

2. Identify all sources of the Release or Threat of Release, if known: (check all that apply)

☐ a. Above-ground Storage Tank (AST) ☐ b. Boat/Vessel ☐ c. Drums ☐ d. Fuel Tank

☐ e. Pipe/Hose/Line ☐ f. Tanker Truck ☐ g. Transformer ☐ h. Under-ground Storage Tank (UST)

☐ i. Vehicle ☑ j. Others Specify: **PCB CAULKING**

3. Identify Oils and Hazardous Materials Released: (check all that apply)

☐ a. Oils ☐ b. Chlorinated Solvents ☐ c. Heavy Metals

☑ d. Others Specify: **POLYCHLORINATED BIPHENYLS**

D. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply, for volumes list cumulative amounts)

☐ 1. Assessment and/or Monitoring Only
☐ 2. Temporary Covers or Caps
☐ 3. Deployment of Absorbent or Containment Materials
☐ 4. Temporary Water Supplies
☐ 5. Structure Venting System
☐ 6. Temporary Evacuation or Relocation of Residents
☐ 7. Product or NAPL Recovery
☐ 8. Fencing and Sign Posting
☐ 9. Groundwater Treatment Systems
☐ 10. Soil Vapor Extraction
☐ 11. Bioremediation
☐ 12. Air Sparging

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Release Tracking Number: 1 - 17872

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

D. DESCRIPTION OF RESPONSE ACTIONS (cont.): (check all that apply, for volumes list cumulative amounts)

☑ 13. Excavation of Contaminated Soils

☐ a. Re-use, Recycling or Treatment ☐ i. On Site Estimated volume in cubic yards _____

☐ ii. Off Site Estimated volume in cubic yards _____

iia. Receiving Facility: _____ Town: _____ State: _____

iib. Receiving Facility: _____ Town: _____ State: _____

iii. Describe: _____

☐ b. Store ☐ i. On Site Estimated volume in cubic yards _____

☐ ii. Off Site Estimated volume in cubic yards _____

iia. Receiving Facility: _____ Town: _____ State: _____

iib. Receiving Facility: _____ Town: _____ State: _____

☑ c. Landfill

☐ i. Cover Estimated volume in cubic yards _____

Receiving Facility: _____ Town: _____ State: _____

☑ ii. Disposal Estimated volume in cubic yards **1605**

Receiving Facility: **778CYEQWAYNE;827CYTREE** Town: **BELLEVILLE MI; ROCHESTE** State: **NH**

☐ 14. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

☑ 15. Removal of Other Contaminated Media:

a. Specify Type and Volume: **ITEM 13 VOLUMES = SOIL/CONCRETE/CAULK; 3 ROLLOFFS (POLY SHEET/PPE/CLEANING MATERIALS TO TREE; 82 DRUMS OF DECON/DUST SUPPRESS. LIQUIDS TO MODEL CITY**

b. Receiving Facility: **TREE** Town: **ROCHESTER** State: **NH**

c. Receiving Facility: **MODEL CITY** Town: **MODEL CITY** State: **NY**

☐ 16. Other Response Actions:

Describe: _____

☐ 17. Use of Innovative Technologies:

Describe: _____

E. LSP SIGNATURE AND STAMP :

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> *if Section B of this form indicates that a* ***Release Abatement Measure Plan*** *is being submitted*, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B of this form indicates that a* ***Release Abatement Measure Status Report*** *and/or* ***Remedial Monitoring Report*** *is being submitted*, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B of this form indicates that a* ***Release Abatement Measure Completion Statement*** *is being submitted*, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal:

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #: 1278

2. First Name: JEFFREY A 3. Last Name: HAMEL

4. Telephone: 9785578150 5. Ext.: 6. FAX:

7. Signature: Jeffrey A Hamel

8. Date: 6/17/2011
(mm/dd/yyyy)

9. LSP Stamp:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

Release Tracking Number
1 - 17872

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

F. PERSON UNDERTAKING RAM:

1. Check all that apply: ☑ a. change in contact name ☐ b. change of address ☐ c. change in the person undertaking response actions

2. Name of Organization: UNIVERSITY OF MASSACHUSETTS

3. Contact First Name: THERESA 4. Last Name: BECHTA

5. Street: 117 DRAPER HALL 6. Title: ASSISTANT DIRECTOR OF ENVIRONMENT

7. City/Town: AMHERST 8. State: MA 9. ZIP Code: 010030000

10. Telephone: 4135573632 11. Ext.: 12. FAX: 4135573634

G. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING RAM:

☑ 1. RP or PRP ☑ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter

☐ e. Other RP or PRP Specify:

☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ 4. Any Other Person Undertaking RAM Specify Relationship:

H. REQUIRED ATTACHMENT AND SUBMITTALS:

☐ 1. Check here if any Remediation Waste, generated as a result of this RAM, will be stored, treated, managed, recycled or reused at the site following submission of the RAM Completion Statement. You must submit a Phase IV Remedy Implementation Plan along with the appropriate transmittal form (BWSC108).

☑ 2. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

☐ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the implementation of a Release Abatement Measure.

☐ 4. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to the DEP Regional Office.

☐ 5. If a RAM Compliance Fee is required for this RAM, check here to certify that a RAM Compliance Fee was submitted to DEP, P. O. Box 4062, Boston, MA 02211.

☑ 6. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Release Tracking Number
1 - 17872

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

I. CERTIFICATION OF PERSON UNDERTAKING RAM:

1. I, **Theresa W. Bechta** , attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: **Theresa W. Bechta** 3. Title: **ASSISTANT DIRECTOR OF ENV**

Signature

4. For: **UNIVERSITY OF MASSACHUSETTS** 5. Date: **6/17/2011**

(Name of person or entity recorded in Section F) (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section F.

7. Street: _____

8. City/Town: _____ 9. State: _____ 10. ZIP Code: _____

11. Telephone: _____ 12. Ext.: _____ 13. FAX: _____

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO $10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY:)

Received by DEP on

6/17/2011 4:41:15 PM

COMMITMENT & INTEGRITY
DRIVE RESULTS

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ATTACHMENT TO BWSC106

UMASS SOUTHWEST CONCOURSE RESIDENTIAL AREA
MASS AVE. AND UNIVERSITY DR.
AMHERST, MA
MASSDEP RTN: 1-17872

SECTION H, QUESTION 2 – STATEMENT OF PROVISIONS

The response actions upon which this LSP Opinion is based were subject to an Approval issued by the United States Environmental Protection Agency (EPA) under 40 CFR 761.61 on August 30, 2010. A copy of the approval is attached.

.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Donald A. Robinson, Ph.D.
Director of Environmental Health & Safety
Draper Hall Room 117
University of Massachusetts
40 Campus Center Way
Amherst, Massachusetts 01003-9244

Re: University of Massachusetts - Amherst
Southwest Residential Area Concourse PCB Cleanup and Disposal Approval under 40 CFR §§ 761.61(a) and (c) and § 761.79(h)

Dear Mr. Robinson:

This is in response to University of Massachusetts (UMASS) Notification[1] for approval of a proposed PCB cleanup for the Southwest Residential Area Concourse located on the University of Massachusetts – Amherst campus (the Site). The Site contains PCB-contaminated materials that exceed the allowable PCB levels under the federal PCB regulations at 40 CFR §§ 761.20, 761.61(a), and 761.62. Specifically, PCBs have been identified in caulk; in surrounding concrete, brick, and asphalt substrates; on *non-porous surfaces* (i.e. granite stairs); and in soils.

In the Notification, UMASS has requested cleanup of the PCB contamination under the self implementing cleanup and disposal option (SIP) at § 761.61(a); the risk-based disposal option at § 761.61(c); and, the alternative decontamination option at § 761.79(h). UMASS is proposing the following PCB cleanup standards and activities under this project:

- For substrates that will be removed and/or encountered as part of the revitalization within the concourse project area, the caulk will be removed under § 761.62, and PCB-contaminated concrete and pavers, bedding sand beneath granite stairs, and, the PCB-contaminated asphalt and soils will be decontaminated under §§ 761.61(a) and 761.79(h) to achieve a *high occupancy area* cleanup standard of less than or equal to (≤) 1 ppm;

---

[1] Information was submitted on behalf of UMASS by Woodward and Curran to satisfy the notification requirements under 40 CFR §§ 761.61(a)(3) and (c), and 761.79(h). Information was provided dated June 2010 (PCB Remediation Plan); July 7, 2010 (update of PCB sampling results); July 27, 2010 (Addendum 1 to Remediation Plan); August 18, 2010 (granite stairs data); and August 24, 2010 (Addendum 2 to Remediation Plan). These submissions will be referred to as the "Notification."

- Soils not planned for removal as part of the revitalization project will meet the ≤1 ppm PCB standard without further restriction or the ≤10 ppm beneath a compliant cap under § 761.61(a)(7);

- The soil area located north face wall of the John Quincy Adams at approximately 5 feet below ground surface (bgs) will be cleaned to a PCB cleanup standard of less than (<) 25 ppm;

- Certain PCB-contaminated substrates, including certain concrete retaining walls, building walls, and a pedestrian tunnel ceiling will be encapsulated under the risk-based option at § 761.61(c) with long term maintenance and monitoring of the encapsulated surfaces;

- *Non-porous surfaces* (e.g. granite stairs) will be removed or decontaminated to a ≤10 µg/100 cm^2;

- Disposal of approximately 45 rolloffs of PCB wastes in a TSCA-approved disposal facility or RCRA hazardous waste landfill in accordance with § 761.61(a)(5)(i)(B)(2)(*iii*);

- Disposal of approximately 77 rolloffs in a RCRA non-hazardous waste landfill as a less than (<) 50 ppm PCB waste in accordance with § 761.61(a)(5)(i)(B)(2)(*ii*); and,

- Implementation of long term maintenance and monitoring of the *encapsulated porous surfaces*; and,

- Recording of a deed notice to document the PCB concentrations at the Site and to document the long-term maintenance and monitoring requirements.

Based on the EPA's review, the information provided in the Notification meets the notification requirements under 40 CFR §§ 761.61(a)(3), 761.79(h), and § 761.61(c) for *PCB remediation waste* and the disposal requirements under § 761.62 for *PCB bulk product waste*. Based on the information provided, EPA has determined that the abatement plan proposed by UMASS will not result in an unreasonable risk to public health or the environment when implemented in accordance with the Notification and the conditions specified in this Approval.

UMASS may proceed with its cleanup in accordance with 40 CFR §§ 761.61(a); 761.61(c); 761.62; 761.79(h); its Notification; and this Approval, subject to the conditions of Attachment 1.

Questions and correspondence regarding this Approval should be directed to:

Kimberly N. Tisa, PCB Coordinator
United States Environmental Protection Agency
5 Post Office Square, Suite 100 (OSRR07-2)
Boston, Massachusetts 02109-3912
Telephone: (617) 918-1527
Facsimile: (617) 918-0527

This Approval does not release UMASS from any applicable requirements of federal, state or local law, including the requirements related to cleanup and disposal of PCBs or other contaminants under the Massachusetts Department of Environmental Protection (MassDEP) regulations.

EPA shall not consider this project complete until it has received all submittals required under this Approval. Please be aware that upon EPA receipt and review of the submittals, EPA may request any additional information necessary to establish that the work has been completed in accordance with 40 CFR Part 761, the Notification, and this Approval.

Sincerely,

James T. Owens, Director
Office of Site Remediation and Restoration

Attachment 1

cc: J. Hamel, Woodward & Curran
MassDEP RTN: 1-17872
File

ATTACHMENT 1.

PCB CLEANUP AND DISPOSAL APPROVAL CONDITIONS
SOUTHWEST RESIDENTIAL AREA CONCOURSE ("the Site")
THE UNIVERSITY OF MASSACHUSETTS - AMHERST

GENERAL CONDITIONS

1. This Approval is granted under the authority of Section 6(e) of the Toxic Substances Control Act (TSCA), 15 U.S.C. § 2605(e), and the PCB regulations at 40 CFR Part 761, and applies solely to the *PCB bulk product waste* and the *PCB remediation waste* located at the Site and identified in the Notification.

2. The University of Massachusetts – Amherst (UMASS) shall conduct on-site activities in accordance with the conditions of this Approval and with the Notification.

3. In the event that the cleanup plan described in the Notification differs from the conditions specified in this Approval, the conditions of this Approval shall govern.

4. The terms and abbreviations used herein shall have the meanings as defined in 40 CFR § 761.3 unless otherwise defined within this Approval.

5. UMASS must comply with all applicable federal, state and local regulations in the storage, handling, and disposal of all PCB wastes, including PCBs, PCB Items and decontamination wastes generated under this Approval. In the event of a new spill during PCB cleanup and disposal activities authorized under this Approval, UMASS shall contact EPA within 24 hours for direction on PCB cleanup and sampling requirements.

6. UMASS is responsible for the actions of all officers, employees, agents, contractors, subcontractors, and others who are involved in activities conducted under this Approval. If at any time UMASS has or receives information indicating that it or any other person has failed, or may have failed, to comply with any provision of this Approval, it must report the information to EPA in writing within 24 hours of having or receiving the information.

7. This Approval does not constitute a determination by EPA that the transporters or disposal facilities selected by UMASS are authorized to conduct the activities set forth in the Notification. UMASS is responsible for ensuring that its selected transporters and disposal facilities are authorized to conduct these activities in accordance with all applicable federal, state and local statutes and regulations.

8. This Approval does not: 1) waive or compromise EPA's enforcement and regulatory authority; 2) release UMASS from compliance with any applicable requirements of federal, state or local law; or 3) release UMASS from liability for, or otherwise resolve, any violations of federal, state or local law.

CERTIFICATION AND NOTIFICATION CONDITIONS

9. This Approval may be revoked if the EPA does not receive written notification from UMASS of its acceptance of the conditions of this Approval within 10 business days of receipt.

CLEANUP AND DISPOSAL CONDITIONS

10. PCB-contaminated materials shall be decontaminated as described below:

    a. The decontamination standard for building *non-porous surfaces* (i.e. granite stairs) shall be as follows:

        i) All visible residues of PCB caulk shall be removed to the extent practical, and surface wipe samples shall be collected in accordance with the frequency specified in the Notification.

            (1) The decontamination wipe standard for *non-porous surfaces* shall be less than or equal to (≤) 10 µg/100 cm^2.

            (2) All post-decontamination verification sampling of *non-porous surfaces* shall be performed on a surface area basis by the standard wipe test as specified in 40 CFR § 761.123 (i.e. µg/100 cm^2).

            (3) Chemical extraction for PCBs shall be conducted using Methods 3500B/3540C of SW-846 and chemical analysis for PCBs shall be conducted using Method 8082 of SW-846, unless another method(s) is validated according to Subpart Q.

        ii) For decontaminated *non-porous surfaces* that have PCB concentrations exceeding the decontamination standard, UMASS may conduct additional decontamination to achieve the required decontamination standard or must store and dispose of these materials as TSCA-regulated waste in accordance with 40 CFR Part 761.

b. The PCB cleanup standard for *porous surfaces* (e.g. concrete, brick, etc.) shall be ≤ 1 part per million (ppm) with the exception of encapsulated *porous surfaces*.

i) All visible residues of PCB caulk shall be removed, to the extent practical.

ii) All post-decontamination verification sampling of *porous surfaces* shall be performed on a bulk basis (i.e. mg/Kg) and analytical results shall be reported on a dry weight basis. Samples shall be collected according to EPA's *draft* Standard Operating Procedure For Sampling Concrete in the Field, dated 12/30/97 to a maximum depth of 0.5 inches. Samples shall be collected as described in the Notification.

iii) Chemical extraction for PCBs shall be conducted using Methods 3500B/3540C of SW-846 and chemical analysis for PCBs shall be conducted using Method 8082 of SW-846, unless another extraction and/or analytical method(s) is validated according to Subpart Q.

iv) For decontaminated *porous surfaces* that have PCB concentrations exceeding the decontamination standard, UMASS may conduct additional decontamination to achieve the required decontamination standard.

c. Encapsulated *porous surfaces*

i) All visible PCB caulk shall be removed, to the extent practical.

ii) Following encapsulation of PCB-contaminated *porous surfaces*, initial surface sampling for PCBs shall be conducted to determine effectiveness of the encapsulation procedure.

(1) Wipe sampling shall be performed on a surface area basis by the standard wipe test as specified in 40 CFR § 761.123 (i.e. µg/100 cm^2). Chemical extraction for PCBs shall be conducted using Methods 3500B/3540C of SW-846 and chemical analysis for PCBs shall be conducted using Method 8082 of SW-846, unless another method(s) is validated according to Subpart Q.

(2) In the event that PCB concentrations in the wipe samples are greater than (>) 1 µg/100 cm^2, UMASS shall contact EPA for further discussion and direction on alternatives.

iii) UMASS shall submit a monitoring and maintenance implementation plan (MMIP) to monitor the long-term effectiveness of the encapsulants. (see Condition 13).

d. The PCB cleanup standard for soils and/or asphalt shall be ≤1 ppm or ≤10 ppm with a § 761.61(a)(7) compliant cap, as applicable, and except as provided in subsection iii, below.

i) Soil samples shall be collected on a bulk basis (i.e. mg/Kg) and PCB analytical results shall be reported on a dry weight analysis. Sampling shall be conducted in accordance with 40 CFR Part 761 and with the sampling frequency described in the Notification.

ii) Chemical extraction for PCBs shall be conducted using Method 3500B/3540C of SW-846 and chemical analysis for PCBs shall be conducted using Method 8082 of SW-846, unless another method(s) is validated according to Subpart Q.

iii) Soils located on the north face wall of the John Quincy Adams building at approximately 5 feet below ground surface (bgs) shall meet a less than (<) 25 ppm PCB cleanup standard.

11. To the maximum extent practical, engineering controls, such as barriers, and removal techniques, such as the use of HEPA ventilated tools, shall be utilized during removal processes. In addition, to the maximum extent possible, disposable equipment and materials, including PPE, will be used to reduce the amount of decontamination necessary.

12. All PCB waste (regardless of concentration) generated as a result of the activities described in the Notification, excluding any decontaminated materials, shall be marked in accordance with § 761.40; stored in a manner prescribed in § 761.65; and, disposed of in accordance with 40 CFR § 761.61(a)(5) and § 761.62, unless otherwise specified below:

a. Decontamination wastes and residues shall be disposed of in accordance with 40 CFR § 761.79(g).

b. Moveable equipment, tools, and sampling equipment shall be decontaminated in accordance with either 40 CFR § 761.79(b)(3)(i)(A), § 761.79(b)(3)(ii)(A), or § 761.79(c)(2).

c. PCB-contaminated water generated during decontamination shall be decontaminated in accordance with 40 CFR §761.79(b)(1) or disposed of under § 761.60.

INSPECTION, MODIFICATION AND REVOCATION CONDITIONS

13. Within sixty (60) days of completion of the activities authorized under this Approval, UMASS shall submit for EPA's review and approval, a detailed long-term monitoring and maintenance implementation plan (MMIP) for the encapsulants.

    a. The MMIP shall include: a description of the activities that will be conducted, including inspection criteria and frequency; surface sampling locations; sampling protocols, sampling frequency, and analytical criteria; and reporting requirements.

    b. The MMIP shall include a communications component which details how the maintenance and monitoring results will be communicated to the building users.

    c. UMASS shall submit the results of these long-term monitoring and maintenance activities to EPA. Based on its review of the results, EPA may determine that modification to the MMIP is necessary in order to insure long-term effectiveness of the physical barriers.

    d. UMASS shall incorporate any changes to the MMIP required by EPA. Activities required under the MMIP shall be conducted until such time that EPA determines, in writing, that such activities are no longer necessary.

14. UMASS shall allow any authorized representative of the Administrator of the EPA to inspect the Site and to inspect records and take samples as may be necessary to determine compliance with the PCB regulations and this Approval. Any refusal by UMASS to allow such an inspection (as authorized by Section 11 of TSCA) shall be grounds for revocation of this Approval.

15. Any proposed modification(s) in the plan, specifications, or information in the Notification must be submitted to EPA no less than 14 calendar days prior to the proposed implementation of the change. Such proposed modifications will be subject to the procedures of 40 CFR § 761.61(a)(3)(ii).

    If such modification involves a change which results in exposures not considered in the Notification, the EPA may revoke, suspend, and/or modify this Approval upon finding that this risk-based cleanup and disposal action may pose an unreasonable risk of injury to health or the environment due to said change. EPA may take similar action if the EPA does not receive requested information needed from UMASS to make a determination regarding potential risk.

16. Any departure from the conditions of this Approval without prior, written authorization from the EPA may result in the revocation, suspension and/or modification of the Approval, in addition to any other legal or equitable relief or remedy the EPA may choose to pursue.

17. Any misrepresentation or omission of any material fact in the Notification or in any records or reports may result in the EPA's revocation, suspension and/or modification of the Approval, in addition to any other legal or equitable relief or remedy the EPA may choose to pursue.

RECORDKEEPING AND REPORTING CONDITIONS

18. UMASS shall prepare and maintain all records and documents required by 40 CFR Part 761, including but not limited to the records required under Subparts J and K. A written record of the decontamination and the analytical sampling shall be established and maintained by UMASS in one centralized location, until such time as EPA approves in writing a request for an alternative disposition of such records. All records shall be made available for inspection to authorized representatives of EPA.

19. UMASS shall submit a Final Completion Report (Report) to the EPA within 120 days of completion of the activities described under this Approval. At a minimum, this Report shall include: a discussion of the project activities; characterization and confirmation sampling analytical results; copies of the accompanying analytical chains of custody; field and laboratory quality control/quality assurance checks; an estimate of the quantity of PCBs removed and disposed off-site; copies of manifests and/or bills of lading; and, copies of certificates of disposal or similar certifications issued by the disposer, if applicable. The Report shall also include a copy of the recorded deed restriction and a certification signed by a UMASS official verifying that the authorized activities have been implemented in accordance with this Approval and the Notification.

20. As required under Condition 13 of this Approval, UMASS shall submit the results of the long-term monitoring and maintenance activities to EPA as specified in the final MMIP to be approved by EPA.

21. Required submittals shall be mailed to:

    Kimberly N. Tisa, PCB Coordinator
    United States Environmental Protection Agency
    5 Post Office Square, Suite 100 (OSRR07-2)
    Boston, Massachusetts 02109-3912
    Telephone: (617) 918-1527
    Facsimile: (617) 918-0527

22. No record, report or communication required under this Approval shall qualify as a self-audit or voluntary disclosure under EPA audit, self-disclosure or penalty policies.

****

END OF ATTACHMENT 1

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.1000 (Subpart J)

Release Tracking Number
1 - 17872

For sites with multiple RTNs, enter the Primary RTN above.

A. SITE LOCATION:

1. Site Name/Location Aid: UMASS SOUTHWEST RESIDENTIAL AREA

2. Street Address: MASS AVE. AND UNIVERSITY DR.

3. City/Town: AMHERST 4. ZIP Code: 010030000

☐ 5. Check here if a Tier Classification Submittal has been provided to DEP for this disposal site.

☐ a. Tier IA ☐ b. Tier IB ☐ c. Tier IC ☐ d. Tier II

6. If a Tier I Permit has been issued, provide Permit Number: _____

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of RAO Statement (if previously submitted): _____ mm/dd/yyyy

☑ 2. Submit a **Response Action Outcome (RAO) Statement**

☐ a. Check here if this RAO Statement covers additional Release Tracking Numbers (RTNs). RTNs that have been previously linked to a Tier Classified Primary RTN do not need to be listed here.

b. Provide additional Release Tracking Number(s) covered by this RAO Statement. ☐ - _____ ☐ - _____

☐ 3. Submit a **Revised Response Action Outcome Statement**

☐ a. Check here if this Revised RAO Statement covers additional Release Tracking Numbers (RTNs), not listed on the RAO Statement or previously submitted Revised RAO Statements. RTNs that have been previously linked to a Tier Classified Primary RTN do not need to be listed here.

b. Provide additional Release Tracking Number(s) covered by this RAO Statement. ☐ - _____ ☐ - _____

☐ 4. Submit a **Response Action Outcome Partial (RAO-P) Statement**

Check above box, if any Response Actions remain to be taken to address conditions associated with this disposal site having the Primary RTN listed in the header section of this transmittal form. This RAO Statement will record only an RAO-Partial Statement for that RTN. A final RAO Statement will need to be submitted that references all RAO-Partial Statements and, if applicable, covers any remaining conditions not covered by the RAO-Partial Statements.

Also, specify if you are an Eligible Person or Tenant pursuant to M.G.L. c. 21E s.2, and have no further obligation to conduct response actions on the remaining portion(s) of the disposal site:

☐ a. Eligible Person ☐ b. Eligible Tenant

☐ 5. Submit an optional **Phase I Completion Statement** supporting an RAO Statement

☐ 6. Submit a **Periodic Review Opinion evaluating the status of a Temporary Solution** for a Class C-1 RAO Statement, as specified in 310 CMR 40.1051 (Section F is optional)

☐ 7. Submit a **Retraction** of a previously submitted **Response Action Outcome Statement** (Sections E & F are not required)

(All sections of this transmittal form must be filled out unless otherwise noted above)

C. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply; for volumes, list cumulative amounts)

- ☐ 1. Assessment and/or Monitoring Only
- ☐ 2. Temporary Covers or Caps
- ☐ 3. Deployment of Absorbent or Containment Materials
- ☐ 4. Treatment of Water Supplies
- ☐ 5. Structure Venting System
- ☐ 6. Engineered Barrier
- ☐ 7. Product or NAPL Recovery
- ☐ 8. Fencing and Sign Posting
- ☐ 9. Groundwater Treatment Systems
- ☐ 10. Soil Vapor Extraction
- ☐ 11. Bioremediation
- ☐ 12. Air Sparging
- ☐ 13. Monitored Natural Attenuation
- ☐ 14. In-situ Chemical Oxidation
- ☑ 15. Removal of Contaminated Soils
  - ☐ a. Re-use, Recycling or Treatment
    - ☐ i. On Site Estimated volume in cubic yards _____
    - ☐ ii. Off Site Estimated volume in cubic yards _____

    iia. Facility Name: _____ Town: _____ State: _____

    iib. Facility Name: _____ Town: _____ State: _____

    iii. Describe: _____
  - ☑ b. Landfill
    - ☐ i. Cover Estimated volume in cubic yards _____

      Facility Name: _____ Town: _____ State: _____
    - ☑ ii. Disposal Estimated volume in cubic yards **1605**

      Facility Name: **778CYEQWAYNE;827CYTREE** Town: **BELLEVILLE MI; ROCHESTER** State: **NH**
- ☐ 16. Removal of Drums, Tanks or Containers:
  - a. Describe Quantity and Amount: _____
  - b. Facility Name: _____ Town: _____ State: _____
  - c. Facility Name: _____ Town : _____ State: _____
- ☑ 17. Removal of Other Contaminated Media:
  - a. Specify Type and Volume: **ITEM 15 VOLUMES = SOIL/CONCRETE/CAULK; 3 ROLLOFFS (POLY SHEET/PPE/CLEANING MATERIALS TO TREE; 82 DRUMS OF DECON/DUST SUPPRESSION LIQUIDS TO MODEL CITY**
  - b. Facility Name: **TREE** Town: **ROCHESTER** State: **NH**
  - c. Facility Name: **MODEL CITY** Town: **MODEL CITY** State: **NY**

C. DESCRIPTION OF RESPONSE ACTIONS (cont.): (check all that apply; for volumes, list cumulative amounts)

☐ 18. Other Response Actions:

Describe: _____

_____

☐ 19. Use of Innovative Technologies:

Describe: _____

D. SITE USE:

1. Are the response actions that are the subject of this submittal associated with the *redevelopment, reuse* or the *major expansion of the current use* of property(ies) impacted by the presence of oil and/or hazardous materials?

☐ a. Yes ☑ b. No ☐ c. Don't know

2. Is the property a *vacant or under-utilized commercial or industrial* property ("a brownfield property")?

☐ a. Yes ☑ b. No ☐ c. Don't know

3. Will funds from a state or federal brownfield incentive program be used on one or more of the property(ies) within the disposal site?

☐ a. Yes ☑ b. No ☐ c. Don't know If Yes, identify program(s): _____

4. Has a Covenant Not to Sue been obtained or sought?

☐ a. Yes ☑ b. No ☐ c. Don't know

5. Check all applicable categories that apply to the person making this submittal: ☐ a. Redevelopment Agency or Authority

☐ b. Community Development Corporation ☐ c. Economic Development and Industrial Corporation

☐ d. Private Developer ☐ e. Fiduciary ☐ f. Secured Lender ☐ g. Municipality

☐ h. Potential Buyer (non-owner) ☑ i. Other, describe: **OWNER**

This data will be used by MassDEP for information purposes only, and does not represent or create any legal commitment, obligation or liability on the part of the party or person providing this data to MassDEP.

E. RESPONSE ACTION OUTCOME CLASS:

Specify the Class of Response Action Outcome that applies to the disposal site, or site of the Threat of Release.
Select **ONLY** one Class.

☐ **1. Class A-1 RAO**: Specify one of the following:

☐ a. Contamination has been reduced to background levels. ☐ b. A Threat of Release has been eliminated.

☑ **2. Class A-2 RAO:** You **MUST** provide justification that reducing contamination to or approaching background levels is infeasible.

☐ **3. Class A-3 RAO**: You **MUST** provide an implemented Activity and Use Limitation (AUL) and justification that reducing contamination to or approaching background levels is infeasible.

☐ **4. Class A-4 RAO**: You **MUST** provide an implemented AUL, justification that reducing contamination to or approaching background levels is infeasible, and justification that reducing contamination to less than Upper Concentration Limits (UCLs) 15 feet below ground surface or below an Engineered Barrier is infeasible. If the Permanent Solution relies upon an Engineered Barrier, you must provide or have previously provided a Phase III Remedial Action Plan that justifies the selection of the Engineered Barrier.

E. RESPONSE ACTION OUTCOME CLASS (cont.):

☐ **5. Class B-1 RAO: Specify one of the following:**

☐ a. Contamination is consistent with background levels ☐ b. Contamination is **NOT** consistent with background levels.

☐ **6. Class B-2 RAO**: You **MUST** provide an implemented AUL.

☐ **7. Class B-3 RAO**: You **MUST** provide an implemented AUL and justification that reducing contamination to less than Upper Concentration Limits (UCLs) 15 feet below ground surface is infeasible.

☐ **8. Class C-1 RAO**: You must submit a plan as specified at 310 CMR 40.0861(2)(h). Indicate type of ongoing response actions.

☐ a. Active Remedial System ☐ b. Active Remedial Monitoring Program ☐ c. None

☐ d. Other Specify: _____

☐ **9. Class C-2 RAO**: You must hold a valid Tier I Permit or Tier II Classification to continue response actions toward a Permanent Solution.

F. RESPONSE ACTION OUTCOME INFORMATION:

1. Specify the Risk Characterization Method(s) used to achieve the RAO described above:

☑ a. Method 1 ☐ b. Method 2 ☐ c. Method 3

☐ d. Method Not Applicable-Contamination reduced to or consistent with background, or Threat of Release abated

2. Specify all Soil Category(ies) applicable. More than one Soil Category may apply at a Site. Be sure to check off all **APPLICABLE** categories:

☐ a. S-1/GW-1	☐ d. S-2/GW-1	☐ g. S-3/GW-1
☑ b. S-1/GW-2	☑ e. S-2/GW-2	☑ h. S-3/GW-2
☑ c. S-1/GW-3	☑ f. S-2/GW-3	☑ i. S-3/GW-3

3. Specify all Groundwater Category(ies) impacted. A site may impact more than one Groundwater Category. Be sure to check off all **IMPACTED** categories:

☐ a. GW-1 ☐ b. GW-2 ☐ c. GW-3 ☑ d. No Groundwater Impacted

4. Specify remediation conducted:

☑ a. Check here if soil remediation was conducted.

☐ b. Check here if groundwater remediation was conducted.

5. Specify whether the analytical data used to support the Response Action Outcome was generated pursuant to the Department's Compendium of Analytical Methods (CAM) and 310 CMR 40.1056:

☐ a. CAM used to support all analytical data. ☑ b. CAM used to support some of the analytical data.

☐ c. CAM not used.

☑ 6. Check here to certify that the Class A, B or C Response Action Outcome includes a Data Usability Assessment and Data Representativeness Evaluation pursuant to 310 CMR 40.1056.

7. Estimate the number of acres this RAO Statement applies to: 5

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.1000 (Subpart J)

Release Tracking Number
1 - 17872

G. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> *if Section B indicates that either an* ***RAO Statement, Phase I Completion Statement and/or Periodic Review Opinion*** *is being provided,* the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #: 1278

2. First Name: JEFFREY A 3. Last Name: HAMEL

4. Telephone: 9785578150 5. Ext.: 6. FAX:

7. Signature: Jeffrey A Hamel

8. Date: 6/17/2011
mm/dd/yyyy

9. LSP Stamp:

H. PERSON MAKING SUBMITTAL:

1. Check all that apply: ☑ a. change in contact name ☐ b. change of address ☐ c. change in the person undertaking response actions

2. Name of Organization: UNIVERSITY OF MASSACHUSETTS

3. Contact First Name: THERESA 4. Last Name: BECHTA

5. Street: 117 DRAPER HALL 6. Title: ASSISTANT DIRECTOR OF ENVIRONMENT

7. City/Town: AMHERST 8. State: MA 9. ZIP Code: 010030000

10. Telephone: 4135773632 11. Ext.: 12. FAX: 4135773634

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.1000 (Subpart J)

Release Tracking Number
1 - 17872

I. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON MAKING SUBMITTAL:

☑ 1. RP or PRP ☑ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter

☐ e. Other RP or PRP Specify:

☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ 4. Any Other Person Making Submittal Specify Relationship:

J. REQUIRED ATTACHMENT AND SUBMITTALS:

☑ 1. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

☐ 2. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the submittal of an RAO Statement that relies on the public way/rail right-of-way exemption from the requirements of an AUL.

☑ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the submittal of a RAO Statement with instructions on how to obtain a full copy of the report.

☑ 4. Check here to certify that documentation is attached specifying the location of the Site, or the location and boundaries of the Disposal Site subject to this RAO Statement. If submitting an RAO Statement for a PORTION of a Disposal Site, you must document the location and boundaries for both the portion subject to this submittal and, to the extent defined, the entire Disposal Site.

☑ 5. Check here to certify that, pursuant to 310 CMR 40.1406, notice was provided to the owner(s) of each property within the disposal site boundaries, or notice was not required because the disposal site boundaries are limited to property owned by the party conducting response actions. (check all that apply)

☐ a. Notice was provided prior to, or concurrent with the submittal of a Phase II Completion Statement to the Department.

☐ b. Notice was provided prior to, or concurrent with the submittal of this RAO Statement to the Department.

☑ c. Notice not required. d. Total number of property owners notified, if applicable: _____

☐ 6. Check here if required to submit one or more AULs. You must submit an AUL Transmittal Form (BWSC113) and a copy of each implemented AUL related to this RAO Statement. Specify the type of AUL(s) below: (required for Class A-3, A-4, B-2, B-3 RAO Statements)

☐ a. Notice of Activity and Use Limitation b. Number of Notices submitted: _____

☐ c. Grant of Environmental Restriction d. Number of Grants submitted: _____

☑ 7. If an RAO Compliance Fee is required for any of the RTNs listed on this transmittal form, check here to certify that an RAO Compliance Fee was submitted to DEP, P. O. Box 4062, Boston, MA 02211.

☐ 8. Check here if any non-updatable information provided on this form is incorrect, e.g. Site Address/Location Aid. Send corrections to the DEP Regional Office.

☑ 9. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC104

RESPONSE ACTION OUTCOME (RAO) STATEMENT

Pursuant to 310 CMR 40.1000 (Subpart J)

Release Tracking Number
1 - 17872

K. CERTIFICATION OF PERSON MAKING SUBMITTAL:

1. I, **Theresa W. Bechta** , attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: **Theresa W. Bechta**
Signature

3. Title: **ASSISTANT DIRECTOR OF EN**

4. For: **UNIVERSITY OF MASSACHUSETTS**
(Name of person or entity recorded in Section H)

5. Date: **6/17/2011**
mm/dd/yyyy

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section H.

7. Street: _____

8. City/Town: _____ 9. State: _____ 10. ZIP Code: _____

11. Telephone: _____ 12. Ext.: _____ 13. FAX: _____

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO $10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY:)

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6/17/2011 4:40:16 PM

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ATTACHMENT TO BWSC104

UMASS SOUTHWEST CONCOURSE RESIDENTIAL AREA
MASS AVE. AND UNIVERSITY DR.
AMHERST, MA
MASSDEP RTN: 1-17872

SECTION J, QUESTION 1 – STATEMENT OF PROVISIONS

The response actions upon which this LSP Opinion is based were subject to an Approval issued by the United States Environmental Protection Agency (EPA) under 40 CFR 761.61 on August 30, 2010. A copy of the approval is attached.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Donald A. Robinson, Ph.D.
Director of Environmental Health & Safety
Draper Hall Room 117
University of Massachusetts
40 Campus Center Way
Amherst, Massachusetts 01003-9244

Re: University of Massachusetts - Amherst
Southwest Residential Area Concourse PCB Cleanup and Disposal Approval under 40 CFR §§ 761.61(a) and (c) and § 761.79(h)

Dear Mr. Robinson:

This is in response to University of Massachusetts (UMASS) Notification[1] for approval of a proposed PCB cleanup for the Southwest Residential Area Concourse located on the University of Massachusetts – Amherst campus (the Site). The Site contains PCB-contaminated materials that exceed the allowable PCB levels under the federal PCB regulations at 40 CFR §§ 761.20, 761.61(a), and 761.62. Specifically, PCBs have been identified in caulk; in surrounding concrete, brick, and asphalt substrates; on *non-porous surfaces* (i.e. granite stairs); and in soils.

In the Notification, UMASS has requested cleanup of the PCB contamination under the self implementing cleanup and disposal option (SIP) at § 761.61(a); the risk-based disposal option at § 761.61(c); and, the alternative decontamination option at § 761.79(h). UMASS is proposing the following PCB cleanup standards and activities under this project:

- For substrates that will be removed and/or encountered as part of the revitalization within the concourse project area, the caulk will be removed under § 761.62, and PCB-contaminated concrete and pavers, bedding sand beneath granite stairs, and, the PCB-contaminated asphalt and soils will be decontaminated under §§ 761.61(a) and 761.79(h) to achieve a *high occupancy area* cleanup standard of less than or equal to (≤) 1 ppm;

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[1] Information was submitted on behalf of UMASS by Woodward and Curran to satisfy the notification requirements under 40 CFR §§ 761.61(a)(3) and (c), and 761.79(h). Information was provided dated June 2010 (PCB Remediation Plan); July 7, 2010 (update of PCB sampling results); July 27, 2010 (Addendum 1 to Remediation Plan); August 18, 2010 (granite stairs data); and August 24, 2010 (Addendum 2 to Remediation Plan). These submissions will be referred to as the "Notification."

- Soils not planned for removal as part of the revitalization project will meet the ≤1 ppm PCB standard without further restriction or the ≤10 ppm beneath a compliant cap under § 761.61(a)(7);

- The soil area located north face wall of the John Quincy Adams at approximately 5 feet below ground surface (bgs) will be cleaned to a PCB cleanup standard of less than (<) 25 ppm;

- Certain PCB-contaminated substrates, including certain concrete retaining walls, building walls, and a pedestrian tunnel ceiling will be encapsulated under the risk-based option at § 761.61(c) with long term maintenance and monitoring of the encapsulated surfaces;

- *Non-porous surfaces* (e.g. granite stairs) will be removed or decontaminated to a ≤10 µg/100 cm^2;

- Disposal of approximately 45 rolloffs of PCB wastes in a TSCA-approved disposal facility or RCRA hazardous waste landfill in accordance with § 761.61(a)(5)(i)(B)(2)(*iii*);

- Disposal of approximately 77 rolloffs in a RCRA non-hazardous waste landfill as a less than (<) 50 ppm PCB waste in accordance with § 761.61(a)(5)(i)(B)(2)(*ii*); and,

- Implementation of long term maintenance and monitoring of the *encapsulated porous surfaces*; and,

- Recording of a deed notice to document the PCB concentrations at the Site and to document the long-term maintenance and monitoring requirements.

Based on the EPA's review, the information provided in the Notification meets the notification requirements under 40 CFR §§ 761.61(a)(3), 761.79(h), and § 761.61(c) for *PCB remediation waste* and the disposal requirements under § 761.62 for *PCB bulk product waste*. Based on the information provided, EPA has determined that the abatement plan proposed by UMASS will not result in an unreasonable risk to public health or the environment when implemented in accordance with the Notification and the conditions specified in this Approval.

UMASS may proceed with its cleanup in accordance with 40 CFR §§ 761.61(a); 761.61(c); 761.62; 761.79(h); its Notification; and this Approval, subject to the conditions of Attachment 1.

Questions and correspondence regarding this Approval should be directed to:

Kimberly N. Tisa, PCB Coordinator
United States Environmental Protection Agency
5 Post Office Square, Suite 100 (OSRR07-2)
Boston, Massachusetts 02109-3912
Telephone: (617) 918-1527
Facsimile: (617) 918-0527

This Approval does not release UMASS from any applicable requirements of federal, state or local law, including the requirements related to cleanup and disposal of PCBs or other contaminants under the Massachusetts Department of Environmental Protection (MassDEP) regulations.

EPA shall not consider this project complete until it has received all submittals required under this Approval. Please be aware that upon EPA receipt and review of the submittals, EPA may request any additional information necessary to establish that the work has been completed in accordance with 40 CFR Part 761, the Notification, and this Approval.

Sincerely,

James T. Owens, Director
Office of Site Remediation and Restoration

Attachment 1

cc: J. Hamel, Woodward & Curran
MassDEP RTN: 1-17872
File

ATTACHMENT 1.

PCB CLEANUP AND DISPOSAL APPROVAL CONDITIONS
SOUTHWEST RESIDENTIAL AREA CONCOURSE ("the Site")
THE UNIVERSITY OF MASSACHUSETTS - AMHERST

GENERAL CONDITIONS

1. This Approval is granted under the authority of Section 6(e) of the Toxic Substances Control Act (TSCA), 15 U.S.C. § 2605(e), and the PCB regulations at 40 CFR Part 761, and applies solely to the *PCB bulk product waste* and the *PCB remediation waste* located at the Site and identified in the Notification.

2. The University of Massachusetts – Amherst (UMASS) shall conduct on-site activities in accordance with the conditions of this Approval and with the Notification.

3. In the event that the cleanup plan described in the Notification differs from the conditions specified in this Approval, the conditions of this Approval shall govern.

4. The terms and abbreviations used herein shall have the meanings as defined in 40 CFR § 761.3 unless otherwise defined within this Approval.

5. UMASS must comply with all applicable federal, state and local regulations in the storage, handling, and disposal of all PCB wastes, including PCBs, PCB Items and decontamination wastes generated under this Approval. In the event of a new spill during PCB cleanup and disposal activities authorized under this Approval, UMASS shall contact EPA within 24 hours for direction on PCB cleanup and sampling requirements.

6. UMASS is responsible for the actions of all officers, employees, agents, contractors, subcontractors, and others who are involved in activities conducted under this Approval. If at any time UMASS has or receives information indicating that it or any other person has failed, or may have failed, to comply with any provision of this Approval, it must report the information to EPA in writing within 24 hours of having or receiving the information.

7. This Approval does not constitute a determination by EPA that the transporters or disposal facilities selected by UMASS are authorized to conduct the activities set forth in the Notification. UMASS is responsible for ensuring that its selected transporters and disposal facilities are authorized to conduct these activities in accordance with all applicable federal, state and local statutes and regulations.

8. This Approval does not: 1) waive or compromise EPA's enforcement and regulatory authority; 2) release UMASS from compliance with any applicable requirements of federal, state or local law; or 3) release UMASS from liability for, or otherwise resolve, any violations of federal, state or local law.

CERTIFICATION AND NOTIFICATION CONDITIONS

9. This Approval may be revoked if the EPA does not receive written notification from UMASS of its acceptance of the conditions of this Approval within 10 business days of receipt.

CLEANUP AND DISPOSAL CONDITIONS

10. PCB-contaminated materials shall be decontaminated as described below:

    a. The decontamination standard for building *non-porous surfaces* (i.e. granite stairs) shall be as follows:

        i) All visible residues of PCB caulk shall be removed to the extent practical, and surface wipe samples shall be collected in accordance with the frequency specified in the Notification.

            (1) The decontamination wipe standard for *non-porous surfaces* shall be less than or equal to (≤) 10 µg/100 cm^2.

            (2) All post-decontamination verification sampling of *non-porous surfaces* shall be performed on a surface area basis by the standard wipe test as specified in 40 CFR § 761.123 (i.e. µg/100 cm^2).

            (3) Chemical extraction for PCBs shall be conducted using Methods 3500B/3540C of SW-846 and chemical analysis for PCBs shall be conducted using Method 8082 of SW-846, unless another method(s) is validated according to Subpart Q.

        ii) For decontaminated *non-porous surfaces* that have PCB concentrations exceeding the decontamination standard, UMASS may conduct additional decontamination to achieve the required decontamination standard or must store and dispose of these materials as TSCA-regulated waste in accordance with 40 CFR Part 761.

b. The PCB cleanup standard for *porous surfaces* (e.g. concrete, brick, etc.) shall be ≤ 1 part per million (ppm) with the exception of encapsulated *porous surfaces*.

i) All visible residues of PCB caulk shall be removed, to the extent practical.

ii) All post-decontamination verification sampling of *porous surfaces* shall be performed on a bulk basis (i.e. mg/Kg) and analytical results shall be reported on a dry weight basis. Samples shall be collected according to EPA's *draft* Standard Operating Procedure For Sampling Concrete in the Field, dated 12/30/97 to a maximum depth of 0.5 inches. Samples shall be collected as described in the Notification.

iii) Chemical extraction for PCBs shall be conducted using Methods 3500B/3540C of SW-846 and chemical analysis for PCBs shall be conducted using Method 8082 of SW-846, unless another extraction and/or analytical method(s) is validated according to Subpart Q.

iv) For decontaminated *porous surfaces* that have PCB concentrations exceeding the decontamination standard, UMASS may conduct additional decontamination to achieve the required decontamination standard.

c. Encapsulated *porous surfaces*

i) All visible PCB caulk shall be removed, to the extent practical.

ii) Following encapsulation of PCB-contaminated *porous surfaces*, initial surface sampling for PCBs shall be conducted to determine effectiveness of the encapsulation procedure.

(1) Wipe sampling shall be performed on a surface area basis by the standard wipe test as specified in 40 CFR § 761.123 (i.e. µg/100 cm^2). Chemical extraction for PCBs shall be conducted using Methods 3500B/3540C of SW-846 and chemical analysis for PCBs shall be conducted using Method 8082 of SW-846, unless another method(s) is validated according to Subpart Q.

(2) In the event that PCB concentrations in the wipe samples are greater than (>) 1 µg/100 cm^2, UMASS shall contact EPA for further discussion and direction on alternatives.

iii) UMASS shall submit a monitoring and maintenance implementation plan (MMIP) to monitor the long-term effectiveness of the encapsulants. (see Condition 13).

d. The PCB cleanup standard for soils and/or asphalt shall be ≤1 ppm or ≤10 ppm with a § 761.61(a)(7) compliant cap, as applicable, and except as provided in subsection iii, below.

i) Soil samples shall be collected on a bulk basis (i.e. mg/Kg) and PCB analytical results shall be reported on a dry weight analysis. Sampling shall be conducted in accordance with 40 CFR Part 761 and with the sampling frequency described in the Notification.

ii) Chemical extraction for PCBs shall be conducted using Method 3500B/3540C of SW-846 and chemical analysis for PCBs shall be conducted using Method 8082 of SW-846, unless another method(s) is validated according to Subpart Q.

iii) Soils located on the north face wall of the John Quincy Adams building at approximately 5 feet below ground surface (bgs) shall meet a less than (<) 25 ppm PCB cleanup standard.

11. To the maximum extent practical, engineering controls, such as barriers, and removal techniques, such as the use of HEPA ventilated tools, shall be utilized during removal processes. In addition, to the maximum extent possible, disposable equipment and materials, including PPE, will be used to reduce the amount of decontamination necessary.

12. All PCB waste (regardless of concentration) generated as a result of the activities described in the Notification, excluding any decontaminated materials, shall be marked in accordance with § 761.40; stored in a manner prescribed in § 761.65; and, disposed of in accordance with 40 CFR § 761.61(a)(5) and § 761.62, unless otherwise specified below:

a. Decontamination wastes and residues shall be disposed of in accordance with 40 CFR § 761.79(g).

b. Moveable equipment, tools, and sampling equipment shall be decontaminated in accordance with either 40 CFR § 761.79(b)(3)(i)(A), § 761.79(b)(3)(ii)(A), or § 761.79(c)(2).

c. PCB-contaminated water generated during decontamination shall be decontaminated in accordance with 40 CFR §761.79(b)(1) or disposed of under § 761.60.

INSPECTION, MODIFICATION AND REVOCATION CONDITIONS

13. Within sixty (60) days of completion of the activities authorized under this Approval, UMASS shall submit for EPA's review and approval, a detailed long-term monitoring and maintenance implementation plan (MMIP) for the encapsulants.

    a. The MMIP shall include: a description of the activities that will be conducted, including inspection criteria and frequency; surface sampling locations; sampling protocols, sampling frequency, and analytical criteria; and reporting requirements.

    b. The MMIP shall include a communications component which details how the maintenance and monitoring results will be communicated to the building users.

    c. UMASS shall submit the results of these long-term monitoring and maintenance activities to EPA. Based on its review of the results, EPA may determine that modification to the MMIP is necessary in order to insure long-term effectiveness of the physical barriers.

    d. UMASS shall incorporate any changes to the MMIP required by EPA. Activities required under the MMIP shall be conducted until such time that EPA determines, in writing, that such activities are no longer necessary.

14. UMASS shall allow any authorized representative of the Administrator of the EPA to inspect the Site and to inspect records and take samples as may be necessary to determine compliance with the PCB regulations and this Approval. Any refusal by UMASS to allow such an inspection (as authorized by Section 11 of TSCA) shall be grounds for revocation of this Approval.

15. Any proposed modification(s) in the plan, specifications, or information in the Notification must be submitted to EPA no less than 14 calendar days prior to the proposed implementation of the change. Such proposed modifications will be subject to the procedures of 40 CFR § 761.61(a)(3)(ii).

    If such modification involves a change which results in exposures not considered in the Notification, the EPA may revoke, suspend, and/or modify this Approval upon finding that this risk-based cleanup and disposal action may pose an unreasonable risk of injury to health or the environment due to said change. EPA may take similar action if the EPA does not receive requested information needed from UMASS to make a determination regarding potential risk.

16. Any departure from the conditions of this Approval without prior, written authorization from the EPA may result in the revocation, suspension and/or modification of the Approval, in addition to any other legal or equitable relief or remedy the EPA may choose to pursue.

17. Any misrepresentation or omission of any material fact in the Notification or in any records or reports may result in the EPA's revocation, suspension and/or modification of the Approval, in addition to any other legal or equitable relief or remedy the EPA may choose to pursue.

RECORDKEEPING AND REPORTING CONDITIONS

18. UMASS shall prepare and maintain all records and documents required by 40 CFR Part 761, including but not limited to the records required under Subparts J and K. A written record of the decontamination and the analytical sampling shall be established and maintained by UMASS in one centralized location, until such time as EPA approves in writing a request for an alternative disposition of such records. All records shall be made available for inspection to authorized representatives of EPA.

19. UMASS shall submit a Final Completion Report (Report) to the EPA within 120 days of completion of the activities described under this Approval. At a minimum, this Report shall include: a discussion of the project activities; characterization and confirmation sampling analytical results; copies of the accompanying analytical chains of custody; field and laboratory quality control/quality assurance checks; an estimate of the quantity of PCBs removed and disposed off-site; copies of manifests and/or bills of lading; and, copies of certificates of disposal or similar certifications issued by the disposer, if applicable. The Report shall also include a copy of the recorded deed restriction and a certification signed by a UMASS official verifying that the authorized activities have been implemented in accordance with this Approval and the Notification.

20. As required under Condition 13 of this Approval, UMASS shall submit the results of the long-term monitoring and maintenance activities to EPA as specified in the final MMIP to be approved by EPA.

21. Required submittals shall be mailed to:

    Kimberly N. Tisa, PCB Coordinator
    United States Environmental Protection Agency
    5 Post Office Square, Suite 100 (OSRR07-2)
    Boston, Massachusetts 02109-3912
    Telephone: (617) 918-1527
    Facsimile: (617) 918-0527

22. No record, report or communication required under this Approval shall qualify as a self-audit or voluntary disclosure under EPA audit, self-disclosure or penalty policies.

****

END OF ATTACHMENT 1

APPENDIX B: PUBLIC NOTIFICATION DOCUMENTATION

COMMITMENT & INTEGRITY
DRIVE RESULTS

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Suite 180
Andover, Massachusetts 01810
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T 978.557.8150
F 978.557.7948

June 17, 2011

Julie Federman, Director
Amherst Health Department
Bangs Center
70 Boltwood Walk
Amherst, MA 01002

Re: MCP Response Action Outcome Statement Notification
Southwest Residential Area
UMass campus, Amherst, Massachusetts
MassDEP Release Tracking Number 1-17872

Dear Ms. Federman:

This letter is being submitted to fulfill the public notification requirements established by the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). As described in 310 CMR 40.1403(3)(f), the public notification provisions require that the Chief Municipal Officer and the Board of Health be notified that a Class A-2 Response Action Outcome (RAO) Statement has been prepared for the Disposal Site referenced above.

Release Abatement Measure (RAM) activities were conducted at the Site beginning in June 2010 in accordance with the RAM Plan filed with the Massachusetts Department of Environmental Protection (MassDEP) and made available for public review. Upon completion of RAM activities, the Class A-2 RAO Statement was prepared under the allowances of RAM Completion documentation (310 CMR 40.0446(3)) and in accordance with the requirements for an RAO Statement (310 CMR 40.1056).

A complete version of the Class A-2 RAO Statement may be reviewed by appointment at the MassDEP Western Regional Office at 436 Dwight Street in Springfield (413-784-1100), or by contacting me at 978-557-8150.

Sincerely,

WOODARD & CURRAN INC.

Jeffrey A. Hamel, LSP, LEP
Senior Vice President

Project No. 223505

cc: MassDEP Western Regional Office
Amherst Town Manager
D. Robinson and T. Bechta, UMass

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June 17, 2011

John Musante, Town Manager
Amherst Town Hall
4 Boltwood Avenue
Amherst, MA 01002

Re: MCP Response Action Outcome Statement Notification
Southwest Residential Area
UMass campus, Amherst, Massachusetts
MassDEP Release Tracking Number 1-17872

Dear Mr. Musante:

This letter is being submitted to fulfill the public notification requirements established by the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). As described in 310 CMR 40.1403(3)(f), the public notification provisions require that the Chief Municipal Officer and the Board of Health be notified that a Class A-2 Response Action Outcome (RAO) Statement has been prepared for the Disposal Site referenced above.

Release Abatement Measure (RAM) activities were conducted at the Site beginning in June 2010 in accordance with the RAM Plan filed with the Massachusetts Department of Environmental Protection (MassDEP) and made available for public review. Upon completion of RAM activities, the Class A-2 RAO Statement was prepared under the allowances of RAM Completion documentation (310 CMR 40.0446(3)) and in accordance with the requirements for an RAO Statement (310 CMR 40.1056).

A complete version of the Class A-2 RAO Statement may be reviewed by appointment at the MassDEP Western Regional Office at 436 Dwight Street in Springfield (413-784-1100), or by contacting me at 978-557-8150.

Sincerely,

WOODARD & CURRAN INC.

Jeffrey A. Hamel, LSP, LEP
Senior Vice President

Project No. 223505

cc: MassDEP Western Regional Office
Amherst Health Department
D. Robinson and T. Bechta, UMass

APPENDIX C: AIR MONITORING LOGS

APPENDIX D: LABORATORY ANALYTICAL REPORTS