



SELF-IMPLEMENTING ON-SITE CLEANUP AND DISPOSAL PLAN

University of
Massachusetts

Lederle Graduate
Research Center

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UMass LGRC

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PREFACE

This Self-Implementing On-Site Cleanup and Disposal Plan (SIP) has been revised from the original March 4, 2009 SIP/Notification submitted to EPA by Woodard & Curran on behalf of the University of Massachusetts. The SIP was prepared to satisfy the notification requirements under 40 CFR 761.61(a). Based on EPA's review of the SIP, comments and responses to comments were prepared and submitted.

EPA issued a PCB Cleanup and Disposal Approval under 40 CFR 761.61(a) and (c) on March 25, 2009. As stated in the Approval, the complete Notification consists of information submitted by Woodard & Curran dated March 4, 2009; and, March 5, 2009, March 10, 2009, March 11, 2009, March 13, 2009, March 17, 2009, and March 23, 2009 (via email). This information has been incorporated into the body of this document.

1. INTRODUCTION

This plan has been prepared by Woodard & Curran (W&C) on behalf of the University of Massachusetts (UMass) to comply with the U.S. Environmental Protection Agency (EPA) requirements for notification of a Self-Implementing On-Site Cleanup and Disposal Plan (SIP) per 40 CFR Part 761.61(a)(3). This plan concerns the proposed excavation and off-site disposal of soils classified as PCB remediation waste at the UMass Lederle Graduate Research Center (LGRC), located at 710-740 North Pleasant Street on the UMass campus in Amherst, Massachusetts. A Site Locus Map is included as Figure 1-1.

1.1 BACKGROUND

The LGRC complex was constructed in the early 1970's as a facility for classroom, library, and office space. The complex consists of a three-story low rise building ("the low rise") and three attached 17-story towers identified as Towers A, B, and C (collectively referred to hereafter as "the high rise"). A photograph of the typical building construction is shown below, depicting the south face of the low rise in foreground, and the east face of the high rise in background.



Certain joint caulking used as part of standard construction practices for masonry buildings and concrete structures erected between the 1940'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. Due to the porous nature of concrete and other masonry surfaces, PCBs in caulking may penetrate into adjacent building materials during application or over time, may leach and/or weather, and/or may be disturbed during renovations or other building work. As such, PCB-containing caulking may come to be located in adjacent materials, such as concrete, other masonry surfaces, or surface soils adjacent to the buildings.

A building renovation project was conducted at LGRC in 2006, including façade pressure washing and the removal and replacement of the original building expansion joint caulking and window caulking. Samples of the caulk collected during the renovation project detected the presence of PCBs at regulated concentrations, indicating that the LGRC buildings were constructed with PCB-containing caulking.

UMass completed the remediation and decontamination of the PCB impacted building materials at the LGRC buildings under a 40 CFR Part 761 approval issued by EPA; however, this approval did not address the cleanup of any PCB impacted soils surrounding the buildings. Specifically, EPA's June 22, 2007 approval letter states:

"Please also note that this Approval **does not** address cleanup of potential PCB-contaminated soils located within the proposed caulking removal areas around the building exteriors. Following completion of the activities authorized under this Approval, UMass shall be responsible for investigating PCB contamination in these areas. In the event that this sampling identifies PCB contamination > 1 ppm, UMass must submit a plan to address the PCB contamination in accordance with 40 CFR 761 and in accordance with applicable state, local, and/or other federal regulations."

In preparation of this plan submittal, soil characterization sampling was conducted in 2006, 2008, and 2009. Based on these results and given the condition stated above, this plan has been prepared for EPA review to address the PCB affected soils at the site.

Soil sampling conducted in July 2006 detected PCBs in exceedance of the reportable concentrations set forth in the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). A Release Notification Form (RNF) was submitted to the Massachusetts Department of Environmental Protection (MassDEP) on August 1, 2006, and Release Tracking Number (RTN 1-16269) was assigned to the site. In accordance with MCP requirements, an Immediate Response Action (IRA) implemented at the site consisted of installing chain link fencing around soils adjacent to the buildings, additional soil sampling, and catch basin sampling and cleaning. An IRA Completion Report was submitted to the MassDEP in February 2008. A Phase 1 Initial Site Investigation and Tier Classification was prepared and submitted to MassDEP in July 2007, classifying the site as a Tier II Disposal Site. It is planned that the soil removal activities described in this plan will be conducted as a Release Abatement Measure (RAM) under the MCP.

1.2 PLAN ORGANIZATION

This Remediation Plan is organized into the following sections:

Section 2: Site Characterization

The site characterization section provides a summary of the soil characterization data collected to date and delineates the nature and extent of PCBs. This section also includes analytical summary data tables and soil sample location maps. In addition to the soil characterization results, this section provides a summary of the status of other media (non-building materials) that were previously impacted by the PCB source material at the site.

Section 3: Remediation Plan

The remediation plan includes a discussion of the remedial objectives and cleanup levels, the remediation approach for PCB-affected media, and a verification sampling approach. This section includes maps depicting areas proposed for remediation and locations for post-remediation verification sampling.

Section 4: Schedule

The implementation and reporting schedule is provided in Section 4. The written certification signed by the owner of the property and required per 40 CFR 761.61(a) is provided in Appendix A.

2. SITE CHARACTERIZATION

This section provides a discussion of the nature and extent of PCB-affected soils at the Site, consistent with the requirements of 40 CFR 761.61(a)(3). Accordingly, PCB-affected soils are identified, described, and depicted on site maps that identify sampling locations to provide a cross-reference to data summary tables.

Upon review of the soil sampling data collected by previous consultants (9 samples by ATC Associates, Inc. in July 2006, and 43 samples by Environmental Health & Engineering in October-November 2006), Woodard & Curran conducted additional soil characterization sampling to determine the nature and extent of PCB-affected areas. The characterization sampling was focused on site soils around the perimeter of the LGRC buildings. A total of 118 primary samples were collected and analyzed for PCBs over the course of three sampling events listed below:

- October 30, 2008: Soil samples collected from 54 locations (42 low rise, 12 high rise);
- November 24, 2008: Soil samples collected from 12 locations (northeast corner of low rise);
- January 27, 2009: Soil samples collected from 52 locations (42 low rise, 10 high rise).

The following sections describe the selection of sample locations, sample collection methods, and the results of the characterization data. A figure depicting the locations of all soil samples collected by Woodard & Curran is presented as Figure 2-1.

For the following reasons, the 2006 data has been considered screening information only: the exact locations of the samples adjacent to the buildings could not be ascertained; the extraction method used (EPA Method 3545) does not have presumptive EPA approval for 40 CFR 761.61 uses; and the 2008-2009 soil data provides sufficient representation of soil conditions adjacent to the building for use in this submittal.

2.1 SAMPLE COLLECTION

During the first round of sampling in October 2008, 50 out of 54 samples were collected from surface soils adjacent to the building from a depth of 0-6 inches below ground surface (bgs). If no soils were located adjacent to the building, then samples were collected from those soils closest to the buildings, i.e. adjacent to a stone walkway along the foundation (applies to the west side of the low rise building). Sample locations were spatially distributed along the perimeter of the low rise and high rise buildings at an approximate 20 foot interval based on the following rationale:

- Results of the data collected by ATC and EH&E did not suggest widespread concentrations of PCBs at levels > 1 ppm; however, sample documentation provided only general sample locations and no discussion of the proximity of the soil sample to the caulking/joint that previously contained PCBs.
- Sample locations were chosen in the field such that the sample was collected below either a vertical building joint or window joint with replacement caulking to represent a worst-case scenario for potential soil impacts.
- The sampling frequency was deemed to be sufficiently comprehensive to establish any pattern of contamination resulting from areas that were power washed within or without a containment area during building renovations in 2006.

In addition to the 50 surface soil samples collected adjacent to the building, two samples were collected adjacent to the building from a depth of 6-12 inches bgs to aid in delineating vertical migration pathways, and two samples were

collected at a distance of ten feet from the building foundation from a depth of 0-6 inches bgs to aid in delineating horizontal migration pathways.

Based on the results of the initial sampling event, a second round of sampling was conducted in November 2008 at the northeast corner of the low rise building because of its designation as a “hotspot” – soils where PCB concentrations exceed 50 ppm – and to aid in developing a profile or conceptual site model of the extent (horizontal and vertical) of PCBs in soils. The twelve samples collected during this field event included five samples adjacent to the building (four from 6-12 inches bgs, one from 12-18 inches bgs) and seven samples at a distance of ten feet from the building (four from 0-6 inches bgs, three from 6-12 inches bgs).

A third round of sampling was conducted in January 2009 to confirm the conceptual site model and to complete the horizontal and vertical delineation of PCBs in soils in support of a soil removal plan. A total of 52 samples were collected from adjacent and non-adjacent soils at multiple depths in hotspot and non-hotspot areas as described in the following table:

Sample Location	Sample Description	Number of Samples
Non-Hot Spot Soils (< 50 ppm)	Adjacent to the building (14-20 inch depth)	15
	12.5 feet from the building (0-6 inch depth)	14
Hot Spot Soils (> 50 ppm)	Adjacent to the building (14-20 inch depth)	10
	12.5 feet from the building (0-6 inch depth)	9
Potential Hot Spot Soils (> 15 ppm, < 50 ppm)	Adjacent to the building (0-3 inch depth)	4

Sample locations were spatially distributed along the perimeter of the low rise and high rise buildings at an approximate 40 foot interval because of the release pathway displayed after the second round of sampling and the volume of characterization data that had already been collected. Samples were collected at a higher frequency in areas that had been established as hot spots after the first round of sampling.

All soil sampling was conducted in accordance with generally accepted procedures for collecting surface soils for the purpose of environmental analysis. All samples were collected from the specified interval by trowel or hand auger. Soils were then placed into a stainless steel mixing bowl, homogenized, and transferred to a labeled, laboratory-approved container. All equipment was decontaminated between each sampling location with an anionic washing detergent/water solution followed by a water rinse to limit the potential for cross-contamination. All samples were entered in the project field book, logged on a standard chain of custody form, and stored on ice for delivery to the laboratory.

Analysis of all samples collected by Woodard & Curran was performed by Analytics Environmental Laboratory of Portsmouth, New Hampshire. All samples were extracted using USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs using USEPA Method 8082. Laboratory analytical data sheets and QA/QC information are provided in Appendix B of this report.

2.2 DATA USABILITY ASSESSMENT

A data quality assessment was conducted to evaluate the usability of the site characterization data. The results were validated by a review of sample custody, holding times, surrogates, method blanks, matrix spike/matrix spike

duplicates, laboratory control samples, and field duplicates. The assessment was performed in general conformance with USEPA Region I Guidelines and the Quality Control Guidelines.

Four duplicate samples and three field equipment blank samples were collected and submitted to the laboratory as part of the QA/QC procedures associated with the sample collection. The results of the duplicate samples in comparison to their associated primary samples indicated that the relative percent differences were within the limits allowed by data acceptance criteria for all four duplicate samples (RPD not greater than 30%), signifying acceptable data precision. No analytes were detected in any of the aqueous field equipment blank samples, indicating that no interferences were introduced during sample collection.

Accuracy of the analytical data was assessed by reviewing recoveries for matrix spikes (MS), matrix spike duplicates (MSD), surrogates, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD). All MS/MSD analyses met acceptance criteria for relative percent difference with the following exceptions: SS1-001, SS31-031, SS46-048, SS22-057, SS24-061, SS2-073, and SS21-090. Appropriate data qualifiers were applied to the laboratory results for these samples. The laboratory control samples were in control for all analytes in all data packages with one exception: the LCS for sample SS26-503 had high recovery for Aroclor 1016, but the LCSD was in control for all analytes. This result is reported without qualification.

Representativeness of the data was evaluated qualitatively utilizing site use information and historical sampling data. Consistent procedures and laboratory analysis of the data were achieved. Sample containers were packed on ice and were accompanied by complete chain of custody forms from the time of sample collection until laboratory delivery. All samples were analyzed within the allowable holding time for their respective analyses. No analytes were detected in the laboratory batch blank analysis, indicating that there were no interferences introduced at the laboratory during sample analysis. All quality control criteria for initial calibration and calibration verification were within acceptable limits.

The data packages were reviewed to ensure that all sample and associated quality assurance results were available. The completeness review indicated that all collected samples were analyzed and all quality control results were available to complete the data validation process.

Based on a review of the existing site data, the data adequately represents the materials tested, and the samples collected to date are considered usable for the purposes of characterizing PCB-affected media in accordance with 40 CFR Part 761.

2.3 RESULTS OF SITE CHARACTERIZATION

2.3.1 Soils

The soil characterization data was compared to the unrestricted use clean-up level of 1 ppm under 40 CFR 761.61(a) for bulk PCB remediation waste. The data indicate that PCBs are present in soils surrounding the LGRC high rise and low rise buildings at concentrations ranging from non-detect to 202 ppm, with PCBs detected above the laboratory reporting limit in 112 of the 118 samples. Aroclor 1254 was the only Aroclor detected in the samples. Based on the concentration and distribution of PCBs detected in LGRC soils, it is apparent that the caulking formerly present in the building and window joints was the source of PCBs.

Three separate rounds of soil sampling (October 2008, November 2008, and January 2009) were conducted at locations both adjacent to the buildings and at a distance of 10 to 12.5 feet from the buildings. Samples were

collected from five depth intervals: 0 to 3 inches bgs, 0 to 6 inches bgs, 6 to 12 inches bgs, 12 to 18 inches bgs, or from 14 to 20 inches bgs.

The samples collected adjacent to the building (within 3 feet) indicated the following results (86 locations):

- Higher PCB concentrations were detected in the surface samples (average 21.8 ppm and maximum of 202 ppm for the 0-3 and 0-6 inch samples) compared to the deeper samples (average 4.31 ppm and maximum of 10.7 ppm for the 6-12 inch samples; average 1.10 ppm and maximum of 7.16 ppm for the 12-18 inch and 14-20 inch samples), which supports the conceptual site model for the PCB release (e.g., surface release from building caulking with decreasing concentrations with depth);
- PCB concentrations in 62 of the 86 samples exceeded 1 ppm; samples were collected from multiple depth intervals;
- PCB concentrations in 9 out of 86 samples exceeded 50 ppm; all samples > 50 ppm were 0-6 inches bgs.

The samples collected from either 10 or 12.5 feet from the building indicated the following results (32 locations):

- PCB concentrations were much lower in these samples compared to those detected in the samples collected within 3 feet of the building, which supports the conceptual site model for the PCB release (e.g., surface release from building caulking with decreasing concentrations with distance from the building);
- Higher PCB concentrations were detected in the surface (0-6 inch) samples (average of 0.48 ppm, maximum of 1.62 ppm) compared to the deeper (6-12 inch) samples (average 0.19 ppm and maximum of 0.26 ppm);
- Twenty-five of the 29 samples collected from the 0-6 inch depth and 3 of the 3 samples collected from the 6-12 inch depth were reported with PCBs less than 1 ppm.

A summary of the analytical results is presented on Table 2-1 and sample locations are shown on Figure 2-1.

The soil characterization results are sufficient to draw conclusions regarding the horizontal and vertical extent of PCBs in site soils. The following discussion has been separated into hotspot soils (≥ 50 ppm PCBs) and non-hotspot soils (< 50 ppm PCBs).

The following conclusions have been reached with regard to hotspot soils (PCBs ≥ 50 ppm):

- Hotspot soils are limited to soils within 12.5 feet of the buildings.
 - PCBs in 7 of the 9 hotspot samples collected 12.5 feet from the building were < 1 ppm; the two > 1 ppm samples were 1.1 and 1.6 ppm (and are therefore considered non-hotspot soils). Given these concentrations, additional pre-remediation sampling is not proposed and these soils will be managed during soil removal (removed with verification sampling).
- Hotspot soils appear to be limited to the upper 6 inches of soils.
 - No PCB concentrations in the hotspot soil samples collected from > 6 inches in depth were ≥ 50 ppm; concentrations ranged from non-detect to 10.7 ppm at depths > 6 inches.
 - PCBs in 8 of the 10 samples collected from 14-20 inches bgs were < 1 ppm; the two > 1 ppm samples were 2.5 and 3.1 ppm. Given these concentrations, additional pre-remediation sampling is not proposed and these soils will be managed during soil removal (removed with verification sampling).

The following conclusions have been reached with regard to non-hotspot soils (PCBs < 50 ppm):

- Non-hotspot soils are limited to soils within 12.5 feet of the buildings.
 - PCBs in all 14 samples collected 12.5 feet from the building in non-hotspots were < 1 ppm.
- Non-hotspot soils are primarily limited to the upper 14 inches of soils.
 - PCBs in 12 of the 15 samples collected from 14-20 inches bgs were < 1 ppm; the three > 1 ppm samples were 3.11, 7.16, and 1.89 ppm. Given these concentrations, additional pre-remediation sampling is not proposed and these soils will be managed during soil removal (removed with verification sampling).

Further details regarding the remediation plan for the contaminated soils are provided in Section 3.

2.3.2 Asphalt

Note: Although the removal of PCB-contaminated asphalt and associated soils is covered in the PCB Abatement Plan (February 21, 2007) and the EPA Approval (June 22, 2007) and will be documented in the final Completion Report being prepared for the building renovation work, a summary of the asphalt characterization, removal, and verification sampling work conducted is presented here for documentation purposes only.

On August 21, 2006, EH&E sampled a section of stained asphalt that had been beneath a construction dumpster during the building renovation work. PCB concentrations in the three asphalt samples were reported at 140 ppm and 1.4 ppm within the stained area, and 0.3 ppm downgradient of the stained area. In August 2007, the stained asphalt was removed and disposed off-site as bulk PCB remediation waste. EH&E collected five verification samples from remaining perimeter asphalt and nine verification samples from soils underlying the asphalt removal area. The five asphalt samples were all reported below the laboratory detection limit (non-detect), and the nine soil samples were reported with concentrations ranging from non-detect to 0.4 ppm. Because all soil and asphalt samples were reported with PCBs < 1 ppm, the remediation work was determined to be complete and the area was restored with new asphalt.

2.3.3 Catch Basin Sediment

Note: Although the removal of PCB-contaminated sediment in site storm water catch basins is covered in the MCP response actions performed as an Immediate Response Action (IRA), a summary of the catch basin cleanout and verification sampling work is summarized here for documentation purposes only.

EH&E collected sediment samples from 17 storm water catch basins between October 11, 2006 and June 28, 2007. PCBs were detected above laboratory reporting limits at 13 locations, with all concentrations < 1 ppm except two locations (2.1 and 25 ppm). Given the proximity of the catch basins to the PCB-affected soils, the PCBs may be attributable to surface run-off from areas adjacent to the buildings.

As part of the IRA, sediments were removed from ten of the catch basins by vacuum truck on November 3, 2006 (CB-1 through CB-10). Two of these catch basins were re-cleaned on July 12, 2007 (CB-1 and CB-7) and seven additional catch basins were cleaned by vacuum truck on the same day (CB-11, CB-12, CB-13, CB-15, CB-16, CB-18, and CB-19). A table summarizing the sediment sampling from the catch basins and a drawing depicting the storm drainage system are provided in Appendix C.

3. REMEDIATION PLAN

3.1 GENERAL OVERVIEW OF PROPOSED REMEDIATION

The work described in this plan is limited to the remediation activities to be conducted on site soils. As described in Section 1, the remediation of the PCB-impacted building materials at the site was conducted under a 40 CFR Part 761 Approval issued by EPA on June 22, 2007.

The proposed remediation activities will include the following:

- Removal and off-site disposal of PCB-impacted soil as bulk PCB remediation waste;
- Collection of verification samples for PCB analysis; and,
- Final restoration of soil excavation areas to their original ground surface coverings.

Prior to the remedial activities, site preparation and controls will be established and implemented. PCB-impacted soils, classified as bulk PCB remediation waste, will be excavated and transported off-site for disposal at an approved facility. Soils with PCB concentrations ≥ 50 ppm will be transported to a permitted hazardous waste landfill (e.g., the Chemical Waste Management Chemical Services facility located in Model City, New York, or equivalent), and soils with PCB concentrations < 50 ppm will be transported to a non-hazardous waste disposal facility (to be determined upon Contractor selection).

The clean-up activities are proposed to be conducted under a self-implementing cleanup and disposal plan per 40 CFR 761.61(a). Given building conditions and use, the applicable cleanup goal for residual PCBs in adjacent soils is the high occupancy area cleanup level of ≤ 1 ppm.

After soils have been excavated to the extent proposed in this plan, verification sampling will be conducted in accordance with a modified Subpart O sampling plan, as described in Section 3.4. Verification samples will be collected per general standard sampling practices for soil from a depth of 0-3 inches below ground surface. All samples will be extracted using USEPA Method 3540C (Soxhlet extraction) and analyzed for PCBs using USEPA Method 8082.

If the results of the verification sampling indicate that PCB concentrations exceed 1 ppm, additional removal will be conducted and additional verification sampling (at an off-set grid) will be performed until sampling results confirm that residual PCB levels are ≤ 1 ppm.

3.2 SITE PREPARATION AND CONTROLS

Prior to initiating the soil excavation, the following site controls will be implemented:

- A Health & Safety Plan will be developed specific to the work activities. All workers will follow 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 will be prepared and submitted for approval, as needed. This includes the MCP Release Abatement Measure (RAM) Plan for the soils;
- Prior to any work, the boundaries of the excavation area will be marked, properly secured, and a permit number obtained from Dig Safe.

- Access to the active work areas will be controlled through fencing with controlled access points;
- Water misting will be used as a dust suppressant, as appropriate.
- Air monitoring within the support work zone and perimeter to this zone will be conducted during the active removal of soils. To reduce dust levels and exposures to dust, a combination of engineering controls and personal protective equipment will be implemented as part of the work activities. A perimeter air monitoring plan is provided in Appendix D.

3.3 SOIL REMOVAL

All soils designated for removal will be excavated and transported off-site for disposal at an approved facility as bulk PCB remediation waste. Soil removal activities will be conducted in compliance with 40 CFR 761.61 and in accordance with the MCP regulations (310 CMR 40.000). The remediation goal is to remove contaminated soils and verify that remaining soil concentrations are ≤ 1 ppm. Post-removal verification sampling will be conducted in all soil excavation areas to demonstrate that the clean-up goals have been achieved.

The area subject to remediation covers an estimated area of 9,950 square feet. The horizontal limit of excavation extends to a distance of 10 feet from the building in most areas (where horizontal delineation samples collected at a distance of 12.5 feet were < 1 ppm and the sample's area of inference is 2.5 feet), and to a distance of 15 feet from the building in select areas (where horizontal delineation samples collected at a distance of 12.5 feet were > 1 ppm). Soil excavation depths will extend to 14 inches in most areas (where vertical delineation samples collected from 14-20 inches bgs were < 1 ppm) and to a depth of 20 inches in select areas (where vertical delineation samples collected from 14-20 inches bgs were > 1 ppm).

An estimate of the excavation volume is broken down as follows:

- An estimated volume of 50 cubic yards of in-place soil from ≥ 50 ppm areas is assumed based on the characterization data (soils in select areas from the upper 6 inches and within 10 feet of the building; refer to Figure 3-1).
- An additional 75 cubic yards of soil within the hotspot areas at depths > 6 inches will be excavated and transported off-site for disposal (soils primarily from the upper 14 inches and within 10 feet of the building). Although these soils are present beneath hotspot soils, characterization data indicates that these soils are likely to contain PCBs at concentrations < 50 ppm; PCB concentrations in these soils will be verified by additional characterization sampling after the top 6 inches of soil are removed. This additional characterization will consist of replicating the initial 20 foot grid spacings used for the soil characterization in these hot-spot areas.
- An estimated volume of 340 cubic yards of in-place soils from < 50 ppm areas is assumed based on the sample characterization (soils primarily from the upper 14 inches and within 10 feet of the building; refer to Figure 3-1).

Assuming a 10% contingency, the total volume of in-place soils to be excavated is estimated at 515 cubic yards. Assuming a 25% factor for typical volumetric expansion of excavated soils, a total planning volume estimate for these soils (e.g. roll-off containers, transportation, etc.) is 640 cubic yards.

Figure 3-1 depicts the locations of the characterization samples collected to date and the proposed remediation areas, excavation depths, and differentiation between hazardous (> 50 ppm) and non-hazardous (< 50 ppm) soils.

3.4 VERIFICATION SAMPLING

Following completion of the initial soil excavation, post-excavation samples will be collected in accordance with a modified 40 CFR 761.280 (Subpart O) sampling plan. Based on the conceptual site model for the release and transport pathway, the defined extent of PCB-affected soils and excavation areas, and the existing data, a verification sampling frequency of one sample per 10 linear feet along the building perimeter is proposed. Verification samples within excavation areas that extend to a distance of 10 feet from the building edge will be collected at a distance of 2.5 feet from the building; in the two excavation areas that extend to a distance of 15 feet from the building, a second verification sample will be collected from the base of excavation at a distance of 12.5 feet from the building. The proposed verification sampling plan is shown on Figure 3-2.

Additional details regarding the verification sampling plan are provided below:

- All samples will be 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.
- In addition to the primary samples indicated above, duplicate and field equipment blank samples will be collected at a frequency of one per twenty primary samples. These samples will be submitted to the laboratory as part of the QA/QC procedures associated with sample collection.
- Upon receipt of the analytical results, the sample data will be compared to the clean-up levels:
 - If ≤ 1 ppm, the clean-up will be considered complete;
 - If > 1 ppm, additional soil excavation activities will be performed in the respective grid areas and verification samples collected at the frequency indicated above using offset sampling locations. This process will be repeated until a cleanup level ≤ 1 ppm is achieved.

3.5 STORAGE AND DISPOSAL

The following activities will be completed with regard to the proper storage and disposal of PCB remediation wastes:

- At the end of each work day, any open excavations will be secured by temporary fencing, steel plates, or partial backfill;
- A secure, lined, covered, and marked waste container (roll-off or equivalent) or 55-gallon DOT-approved steel containers will be staged for the collection of PCB wastes generated during the work activities in accordance with 40 CFR 761.65 and/or soils will be direct loaded in transportation vehicles for shipment to the disposal facility;
- All containers will be properly labeled and marked in accordance with 40 CFR 761.40;
- Upon completion of the work or when a container is considered full, the waste will be transported off-site under manifest or bills of lading for disposal at an approved disposal facility. Soils classified as hazardous waste (≥ 50 ppm) will be segregated for disposal at a hazardous waste landfill (e.g. the Chemical Waste Management facility located in Model City, New York, or equivalent). Soils classified as non-hazardous (< 50 ppm) will be segregated for disposal at a non-hazardous waste disposal facility;
- Copies of all manifests, waste shipment records, bills of lading, and certificates of disposal will be collected and provided as part of the final report to EPA.

3.6 SITE RESTORATION

Following completion of the removal activities and verification that the cleanup levels have been met, all soil excavation areas will be backfilled and compacted and the ground surface restored to its original condition (grass, wood chips, etc.). The site controls will be dismantled and all wastes will be transported off-site for proper disposal.

3.7 RECORDKEEPING AND DOCUMENTATION

Following completion of the work activities, records and documents per 40 CFR Part 761 will be generated and maintained at one location. These documents will be made available to EPA upon request. A final report documenting the completion of the work activities and including but not limited to a description of the work activities, verification analytical results, volumes of disposed materials, and waste disposal documentation will be prepared and submitted to EPA.

4. SCHEDULE

Remediation activities will be initiated upon approval of this plan. It is anticipated that the soil removal activities described in this plan will be documented and completed in accordance with EPA's Approval Conditions, the Release Abatement Measure (RAM), and the MCP.

Given the MCP deadlines that apply to this release, the remediation work is targeted for implementation in the April/May timeframe of 2009 in order to achieve site closure (Response Action Outcome Completion Statement) for RTN 1-16269 by the July 2009 MCP deadline.

Table 2-1
Summary of Soil Characterization Data
UMass Amherst Lederle Graduate Research Center

Media	Depth (inches)	Date	Sample ID	Distance from Building	Total PCBs
Low-Rise, Southeast - Non-Hotspot Soils					
Soil	0 - 6	10/30/08	LGRC-SS1-001	Adjacent	9.69 J
Soil	0 - 6	1/27/09	LGRC-SS57-071	12.5' from building	0.792
Soil	0 - 6	10/30/08	LGRC-SS2-002	Adjacent	9.15
Soil	14 - 20	1/27/09	LGRC-SS2-073	Adjacent	3.11 J
Soil	0 - 6	10/30/08	LGRC-SS3-003	Adjacent	6.42
Soil	0 - 6	10/30/08	LGRC-SS4-004	Adjacent	3.65
Soil	14 - 20	1/27/09	LGRC-SS4-074	Adjacent	7.16
Soil	0 - 6	1/27/09	LGRC-SS58-072	12.5' from building	0.265
Soil	0 - 6	10/30/08	LGRC-SS5-005	Adjacent	3.35
Soil	0 - 6	10/30/08	LGRC-SS6-006	Adjacent	1.37
Soil	0 - 6	10/30/08	LGRC-SS7-007	Adjacent	1.89
Soil	14 - 20	1/27/09	LGRC-SS7-075	Adjacent	0.150
Soil	0 - 6	1/27/09	LGRC-SS59-076	12.5' from building	0.413 J
Soil	0 - 6	10/30/08	LGRC-SS8-008	Adjacent	0.31
Low-Rise, Southeast - Hotspot Soils					
Soil	0 - 6	10/30/08	LGRC-SS9-009	Adjacent	142
Soil	14 - 20	1/27/09	LGRC-SS9-077	Adjacent	0.594
Soil	0 - 6	1/27/09	LGRC-SS60-078	12.5' from building	< 0.036
Soil	14 - 20	1/27/09	LGRC-SS61-079	3' from building	< 0.036
Soil	0 - 6	1/27/09	LGRC-SS62-080	12.5' from building	1.12 J
Soil	0 - 6	10/30/08	LGRC-SS10-010	Adjacent	44.1
Low-Rise, East/Northeast - Non-Hotspot Soils					
Soil	0 - 6	10/30/08	LGRC-SS11-011	Adjacent	3.51
Soil	0 - 6	1/27/09	LGRC-SS63-081	12.5' from building	0.558
Soil	0 - 6	10/30/08	LGRC-SS12-012	Adjacent	11.5
Soil	14 - 20	1/27/09	LGRC-SS12-082	Adjacent	0.806
Soil	0 - 6	10/30/08	LGRC-SS13-013	Adjacent	2.99
Soil	0 - 3	1/27/09	LGRC-SS14-119	Adjacent	6.300
Soil	0 - 6	10/30/08	LGRC-SS14-014	Adjacent	25.1
Soil	14 - 20	1/27/09	LGRC-SS14-083	Adjacent	1.890
Soil	0 - 6	1/27/09	LGRC-SS64-084	12.5' from building	0.246
Soil	0 - 6	10/30/08	LGRC-SS15-015	Adjacent	1.93
Soil	0 - 6	10/30/08	LGRC-SS16-016	Adjacent	0.39
Soil	0 - 6	10/30/08	LGRC-SS17-017	Adjacent	3.78
Soil	14 - 20	1/27/09	LGRC-SS17-086	Adjacent	0.433
Soil	0 - 6	1/27/09	LGRC-SS65-085	12.5' from building	0.209
Soil	0 - 6	10/30/08	LGRC-SS18-018	Adjacent	6.97
Soil	0 - 3	1/27/09	LGRC-SS19-120	Adjacent	8.430
Soil	0 - 6	10/30/08	LGRC-SS19-019	Adjacent	16.1
Soil	14 - 20	1/27/09	LGRC-SS19-088	Adjacent	0.077
Soil	0 - 6	1/27/09	LGRC-SS66-087	12.5' from building	0.089 J
Soil	0 - 6	10/30/08	LGRC-SS20-020	Adjacent	5.07
Soil	0 - 6	1/27/09	LGRC-SS67-089	12.5' from building	< 0.040
Soil	0 - 6	10/30/08	LGRC-SS21-021	Adjacent	6.03
Soil	14 - 20	1/27/09	LGRC-SS21-090	Adjacent	0.947 J
Soil	0 - 6	10/30/08	LGRC-SS22-022	Adjacent	1.86
Soil	6 - 12	11/24/08	LGRC-SS22-057	Adjacent	1.26 J
Soil	0 - 6	11/24/08	LGRC-SS53-063	10' from building	0.845
Soil	6 - 12	11/24/08	LGRC-SS53-067	10' from building	0.198
Soil	0 - 6	10/30/08	LGRC-SS23-023	Adjacent	10.5
Soil	6 - 12	11/24/08	LGRC-SS23-058	Adjacent	2.19
Soil	0 - 6	11/24/08	LGRC-SS54-064	10' from building	1.20
Soil	6 - 12	11/24/08	LGRC-SS54-068	10' from building	0.263

Table 2-1
Summary of Soil Characterization Data
UMass Amherst Lederle Graduate Research Center

Media	Depth (inches)	Date	Sample ID	Distance from Building	Total PCBs
Low-Rise, East/Northeast - Hotspot Soils					
Soil	0 - 6	10/30/08	LGRC-SS24-024	Adjacent	106
Soil	6 - 12	11/24/08	LGRC-SS24-059	Adjacent	9.56
Soil	12 - 18	11/24/08	LGRC-SS24-061	Adjacent	2.26 J
Soil	14 - 20	1/27/09	LGRC-SS24-091	Adjacent	2.51
Soil	0 - 6	11/24/08	LGRC-SS55-065	10' from building	0.381
Soil	6 - 12	11/24/08	LGRC-SS55-069	10' from building	0.117
Soil	0 - 6	10/30/08	LGRC-SS25-025	Adjacent	53.0
Soil	6 - 12	11/24/08	LGRC-SS25-060	Adjacent	1.04
Soil	14 - 20	1/27/09	LGRC-SS25-092	Adjacent	0.884
Soil	0 - 6	11/24/08	LGRC-SS56-066	10' from building	0.485
Low-Rise, Northwest - Non-Hotspot Soils					
Soil	0 - 6	10/30/08	LGRC-SS26-026	Adjacent	5.33
Soil	14 - 20	1/27/09	LGRC-SS26-093	First soil	0.260
Soil	0 - 6	1/27/09	LGRC-SS68-094	12.5' from first soil	0.191
Soil	0 - 6	10/30/08	LGRC-SS27-027	Adjacent	3.01
Soil	0 - 6	10/30/08	LGRC-SS28-028	Adjacent	2.73
Soil	0 - 6	1/27/09	LGRC-SS69-095	12.5' from first soil	< 0.400
Soil	0 - 6	10/30/08	LGRC-SS29-029	Adjacent	11.6
Soil	14 - 20	1/27/09	LGRC-SS29-096	First soil	0.132
Soil	0 - 6	10/30/08	LGRC-SS30-030	Adjacent	2.49
Soil	0 - 6	10/30/08	LGRC-SS31-031	Adjacent	8.59 J
Soil	14 - 20	1/27/09	LGRC-SS31-097	First soil	0.092
Soil	0 - 6	1/27/09	LGRC-SS70-098	12.5' from first soil	0.173
Soil	0 - 6	10/30/08	LGRC-SS32-032	Adjacent	1.59
Low-Rise, West - Non-Hotspot Soils					
Soil	0 - 6	10/30/08	LGRC-SS35-035	Adjacent	11.3
Soil	14 - 20	1/27/09	LGRC-SS35-101	First soil	0.434
Soil	0 - 6	1/27/09	LGRC-SS72-102	12.5' from first soil	< 0.043
Soil	0 - 6	10/30/08	LGRC-SS36-036	Adjacent	15.7
Soil	0 - 3	1/27/09	LGRC-SS37-121	First soil	5.460
Soil	0 - 6	10/30/08	LGRC-SS37-037	Adjacent	21.3
Soil	14 - 20	1/27/09	LGRC-SS37-103	First soil	0.135
Soil	0 - 6	1/27/09	LGRC-SS73-104	12.5' from first soil	0.115
Soil	0 - 6	10/30/08	LGRC-SS38-038	Adjacent	12.7
Soil	0 - 3	1/27/09	LGRC-SS39-122	First soil	6.620
Soil	0 - 6	10/30/08	LGRC-SS39-039	Adjacent	21.6
Soil	14 - 20	1/27/09	LGRC-SS39-105	First soil	0.174
Low-Rise, West - Hotspot Soils					
Soil	0 - 6	10/30/08	LGRC-SS33-033	Adjacent	39.0
Soil	0 - 6	10/30/08	LGRC-SS34-034	Adjacent	80.0
Soil	14 - 20	1/27/09	LGRC-SS34-100	First soil	0.968
Soil	0 - 6	1/27/09	LGRC-SS71-099	12.5' from first soil	< 0.043
Soil	0 - 6	1/27/09	LGRC-SS74-106	12.5' from first soil	0.146
Soil	0 - 6	10/30/08	LGRC-SS40-040	First soil	62.1
Soil	14 - 20	1/27/09	LGRC-SS40-107	First soil	0.145
Soil	0 - 6	1/27/09	LGRC-SS75-108	12.5' from first soil	0.201
Soil	0 - 6	10/30/08	LGRC-SS41-041	First soil	40.5

Table 2-1
Summary of Soil Characterization Data
UMass Amherst Lederle Graduate Research Center

Media	Depth (inches)	Date	Sample ID	Distance from Building	Total PCBs
High-Rise, East - Hotspot Soils					
Soil	0 - 6	1/27/09	LGRC-SS76-109	12.5' from building	1.590
Soil	0 - 6	10/30/08	LGRC-SS42-042	10' from building	1.62
Soil	0 - 6	10/30/08	LGRC-SS43-043	Adjacent	51.1
Soil	6 - 12	10/30/08	LGRC-SS43-045	Adjacent	10.7
Soil	14 - 20	1/27/09	LGRC-SS43-110	Adjacent	0.484
High-Rise, West - Non-Hotspot Soils					
Soil	0 - 6	10/30/08	LGRC-SS44-046	Adjacent	2.07
Soil	14 - 20	1/27/09	LGRC-SS44-111	Adjacent	0.267
Soil	0 - 6	1/27/09	LGRC-SS77-112	12.5' from building	0.126 J
Soil	0 - 6	10/30/08	LGRC-SS45-047	Adjacent	0.69
Soil	0 - 6	10/30/08	LGRC-SS46-048	Adjacent	2.34 J
Soil	6 - 12	10/30/08	LGRC-SS46-050	Adjacent	1.08
Soil	0 - 6	10/30/08	LGRC-SS51-055	10' from building	0.64
Soil	0 - 6	10/30/08	LGRC-SS52-056	Adjacent	6.37
High-Rise, West - Hotspot Soils					
Soil	0 - 6	10/30/08	LGRC-SS47-051	Adjacent	202
Soil	14 - 20	1/27/09	LGRC-SS47-114	Flush with overhang	0.631
Soil	0 - 6	1/27/09	LGRC-SS78-113	12.5' from building	0.679 J
Soil	0 - 6	10/30/08	LGRC-SS48-052	Flush with overhang	69.3
Soil	14 - 20	1/27/09	LGRC-SS48-115	Flush with overhang	0.826
Soil	0 - 6	1/27/09	LGRC-SS79-116	12.5' from building	0.547
Soil	0 - 6	10/30/08	LGRC-SS49-053	Flush with overhang	63.9
Soil	14 - 20	1/27/09	LGRC-SS49-118	Flush with overhang	3.130
Soil	0 - 6	1/27/09	LGRC-SS80-117	12.5' from building	0.741
Soil	0 - 6	10/30/08	LGRC-SS50-054	Adjacent	44.7

All samples extracted by Soxhlet Method 3540C and analyzed by USEPA Method 8082.

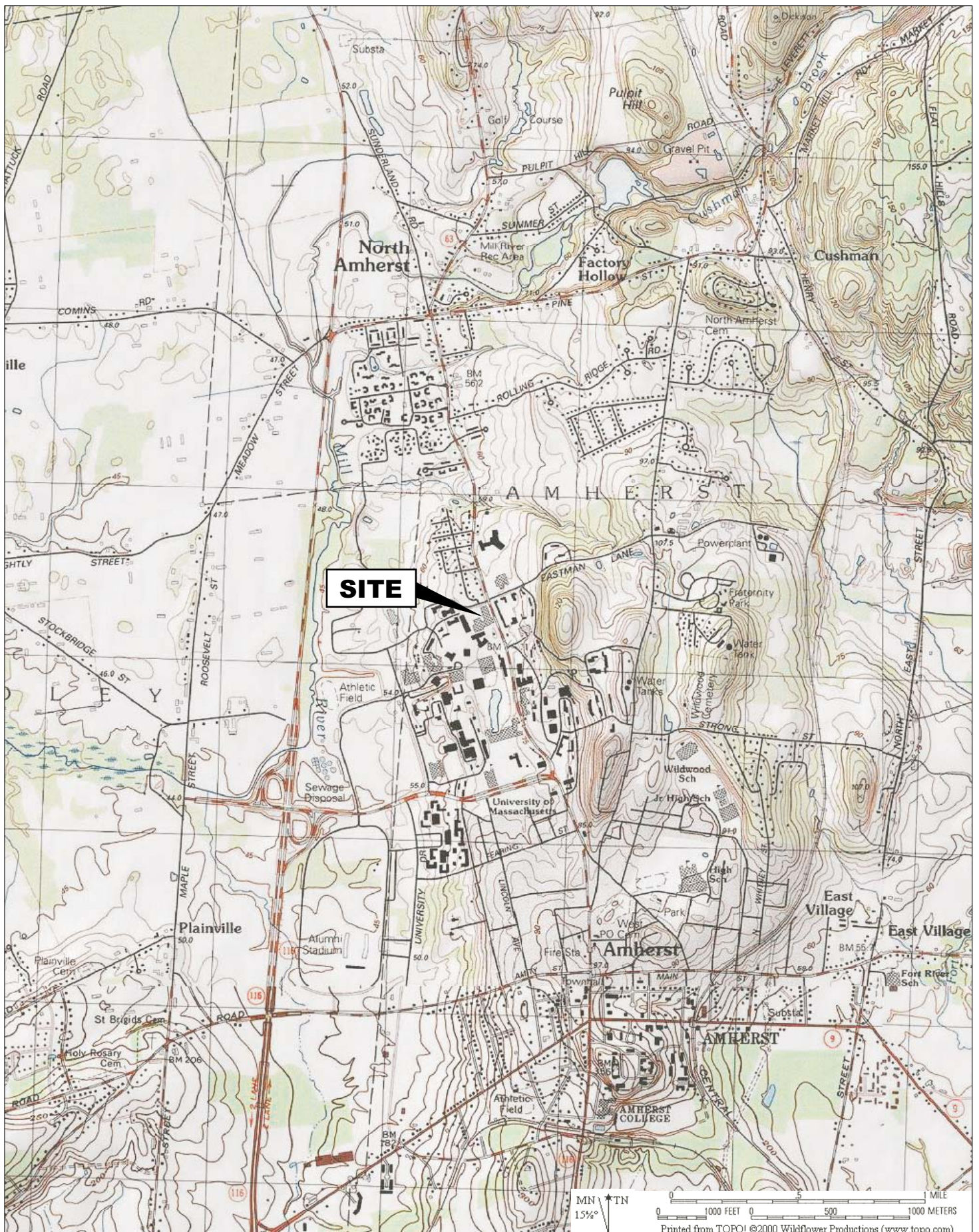
All sample results are presented in milligrams per kilogram (mg/kg).

All PCBs detected are Aroclor 1254; no other Aroclors were detected in any samples.

A **bold** concentration indicates an exceedance of the 1 ppm cleanup level.

< = Less than the laboratory's minimum reporting limit, as indicated.

J = Estimated concentration.



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 COMMITMENT & INTEGRITY DRIVE RESULTS

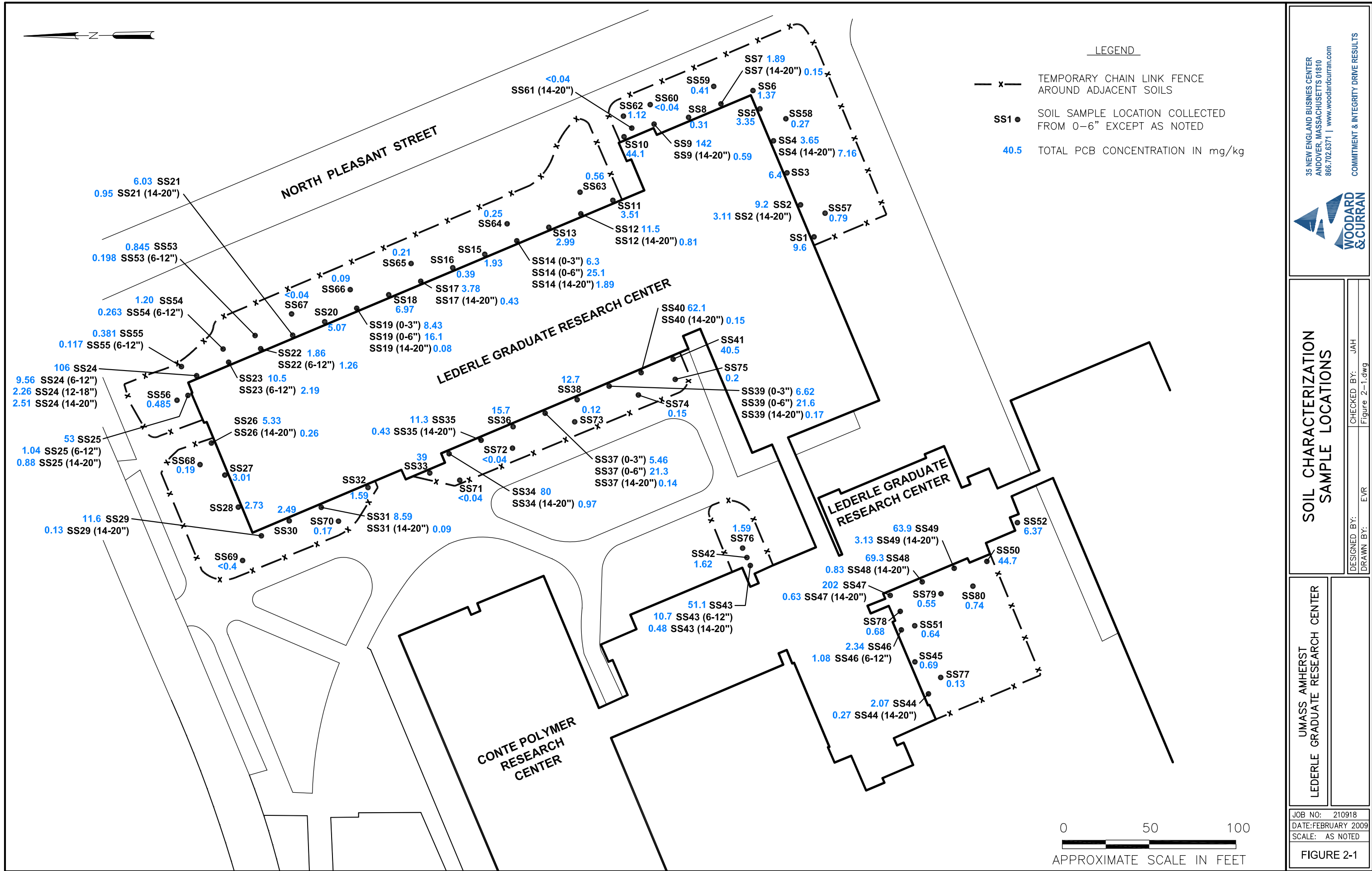
UMASS AMHERST
 LEDERLE GRADUATE RESEARCH CENTER
 AMHERST, MASSACHUSETTS

SCALE: AS NOTED
 DATE: FEBRUARY 2009
 JOB NO.: 210918
 FILE: Figure 1-1.cnv

SITE LOCUS

DES.BY: EVR
 DR.BY: EVR
 CK.BY: AM

1-1



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COMMITMENT & INTEGRITY DRIVE RESULTS

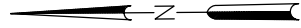
SOIL CHARACTERIZATION
SAMPLE LOCATIONS

DESIGNED BY: JAH
CHECKED BY: JAH
DRAWN BY: EVR
Figure 2-1.dwg

UMASS AMHERST
LEDERLE GRADUATE RESEARCH CENTER

JOB NO: 210918
DATE: FEBRUARY 2009
SCALE: AS NOTED

FIGURE 2-1



NOTES:


1. SOILS WILL BE EXCAVATED TO A DEPTH OF 14" UNLESS OTHERWISE NOTED.
2. ALL EXCAVATIONS EXTEND TO A DISTANCE OF 10' AWAY FROM THE INSTANCE OF FIRST SOIL WITH THE EXCEPTION OF SOILS REPRESENTED BY SS62 AND SS76 - THESE EXCAVATIONS WILL EXTENT TO 15' FROM THE BUILDING.
3. SOILS CONTAINING PCBs >50 ppm ARE PRESENT ONLY IN THE UPPER 6" OF SOILS. AFTER REMOVAL OF THE UPPER 6" OF >50 ppm SOILS, THE UNDERLYING SOILS WILL BE HANDLED AS <50 ppm SOIL PENDING ANALYTICAL CONFIRMATION.

LEGEND

- x — TEMPORARY CHAIN LINK FENCE AROUND ADJACENT SOILS
- SS1 ● SOIL SAMPLE LOCATION
- PROPOSED SOIL REMOVAL AREA (PCB <50 ppm)
- PROPOSED SOIL REMOVAL AREA (PCB >50 ppm)
- AREA OF 20" REMOVAL DEPTH

0 50 100
APPROXIMATE SCALE IN FEET

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DRAWN BY: EVR

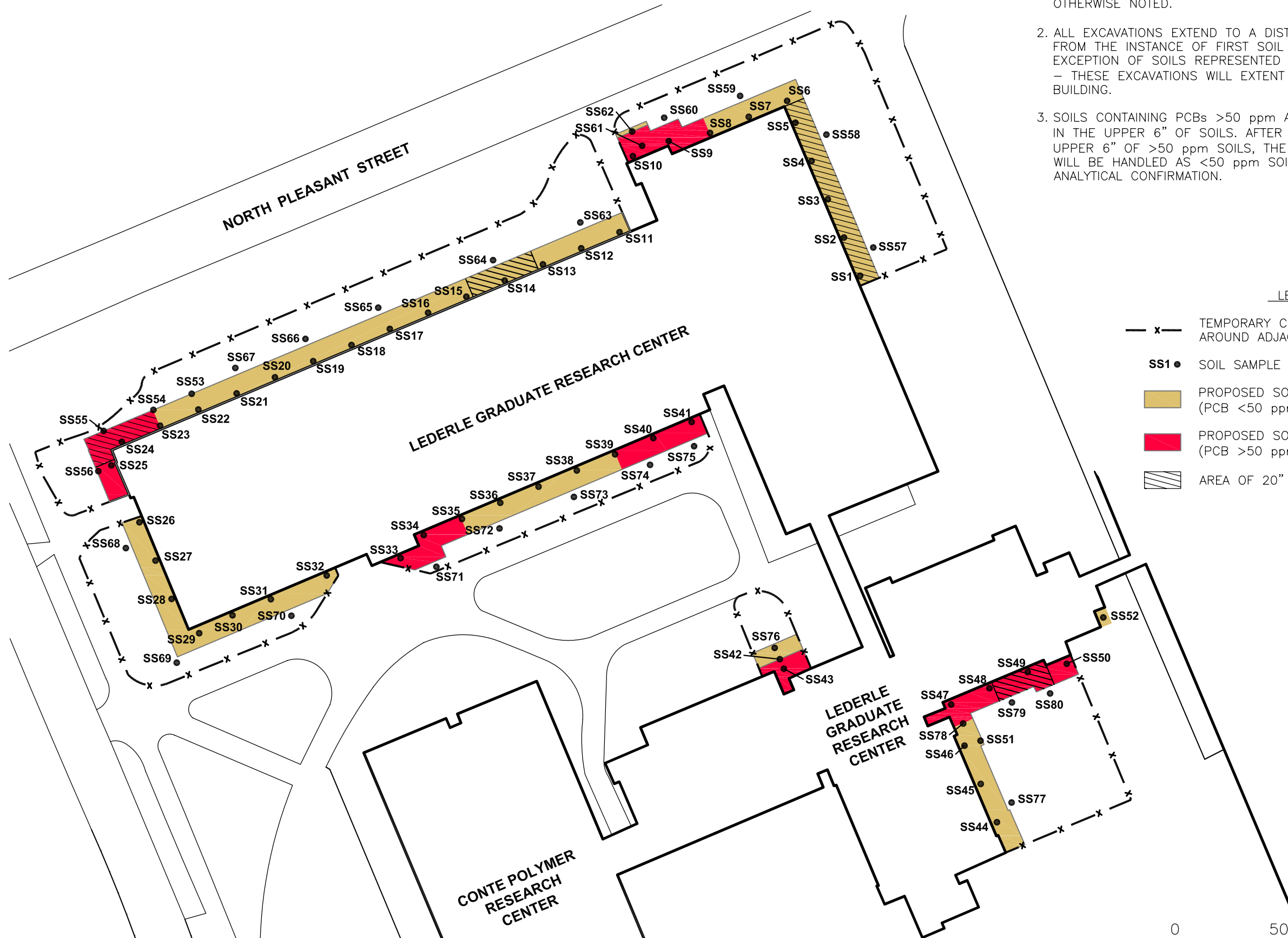
CHECKED BY: JAH
Figure 3-1.dwg

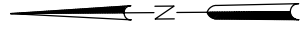
UMASS AMHERST
LEDERLE GRADUATE RESEARCH CENTER

PROPOSED SOIL REMOVAL AREAS

JOB NO: 210918
DATE: MARCH 2009
SCALE: AS NOTED

FIGURE 3-1





LEGEND

- x — TEMPORARY CHAIN LINK FENCE AROUND ADJACENT SOILS
- PROPOSED VERIFICATION SAMPLE (APPROXIMATE 10 FOOT SPACINGS)
- PROPOSED 0–6" CHARACTERIZATION SAMPLE OUTSIDE LIMITS OF EXCAVATION

PROPOSED VERIFICATION SAMPLING
PLAN (REVISED)

DESIGNED BY: JAH
DRAWN BY: EVR
CHECKED BY: JAH
Figure 3-2 rev.dwg

UMASS AMHERST
LEDERLE GRADUATE RESEARCH CENTER

JOB NO: 210918
DATE: MARCH 2009
SCALE: AS NOTED

FIGURE 3-2

0 50 100
APPROXIMATE SCALE IN FEET

APPENDIX A: WRITTEN CERTIFICATION



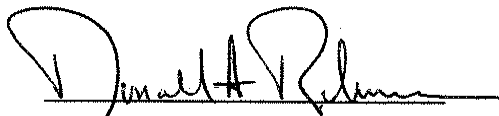
Certification

The undersigned owner of the property where the cleanup site is located and the party conducting the cleanup certify that all sampling plans, sampling collection procedures, sample preparation procedures, extraction procedures and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the cleanup site are on file at the location indicated below and are available for EPA inspection, as set forth below.

Document Location

University of Massachusetts
Facilities and Campus Planning
Physical Plant Building
360 Campus Center Way
Amherst, Massachusetts 01003

Property Owner and Party Conducting the Cleanup


Authorized Signature

3-4-09
Date

DONALD ROBINSON, PE, PHD
Name of Authorized representative (print)

DIRECTOR, ENV. HEALTH + SAFETY
Title

APPENDIX B: LABORATORY DATA

APPENDIX C: STORM WATER DRAINAGE INFORMATION

Table 5.2 Catch Basin Sediment Sampling Results, Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts

Sample ID	Location*	Sample Type	Description	Comments	Aroclor 1254™ (ppm)	Notes
October 11, 2006						
80575	CB-1	Sediment	Detritus and sediment.	Dry basin.	0.27	2C(0.25)
80576	CB-2	Sediment	Detritus. Sediment.	Water in basin	0.33	2C(0.29)
80577	CB-3	Sediment	Anthropogenic materials, fine to coarse sand, and silt. Detritus.	Water in basin	0.71	2C(0.57)
80578	CB-3	Sediment (duplicate)	Anthropogenic materials, fine to coarse sand and silt. Detritus.	Water in basin	0.21	2C(0.20)
80579	CB-4	Sediment	Detritus mixed with fine to coarse sand.	Water in basin	BRL <0.170	—
80580	CB-5	Sediment	Detritus and sediment.	Water in basin	BRL <0.270	—
80581	CB-6	Sediment	Anthropogenic materials: Broken glass, garbage, detritus, bark mulch, sediment.	Dry basin.	0.73	2C(0.68)
80582	CB-10	Sediment	Leaves, garbage, detritus, anthropogenic materials. Little sediment.	Water in basin. Caulk-like debris noted and removed from sample prior to collection.	25 (J)	1C(23)
80583	CB-8	Sediment	Fine black to grey silt. Little coarse sand. Trace small gravel.	Water in basin	BRL <0.110	—
—	CB-9	No sample	No sediment in basin.	Water in basin	—	—
—	CB-7	No sample	Basin was inaccessible.	—	—	—
November 3, 2006						
CB -7	CB-7	Sediment	Detritus and sediment.	Water in basin	0.27	2C(0.24)
May 1, 2007						
83213	CB-11	Sediment	Detritus, fine to coarse sediment, anthropogenic materials.	Water in basin	0.21	2C(0.19)
83214	CB-18	Sediment	Detritus, fine to coarse sediment, anthropogenic materials.	Water in basin	0.30	2C(0.23)
83215	CB-12	Sediment	Anthropogenic materials, fine to coarse sand, silt. Detritus.	Water in basin	0.32	2C(0.30)
83216	CB-13	Sediment	Medium to coarse sand and silt, detritus, anthropogenic materials.	Water in basin	2.1	1C(1.9)
83217	CB-1	Sediment	Detritus, silt, fine to medium sand, anthropogenic materials.	Water in basin	0.19	2C(0.17)

Table 5.2 Continued

Sample ID	Location*	Sample Type	Description	Comments	Aroclor 1254** (ppm)	Notes
83218	CB-15	Sediment	Silt, some fine to medium sand. Detritus.	Water in basin	0.19	2C(0.16)
83219	CB-15	Sediment (duplicate)	Silt, some fine to medium sand. Detritus.	Water in basin	0.19	2C(0.17)
33220	CB-17	Sediment	Silt, some fine to medium sand. Detritus.	Water in basin	BRL <0.14	—
83221	CO-1	Sediment	Fine to coarse sand, silt, gravel.	Water in basin	BRL <0.10	—
83223	CB-16	Sediment	Fine to coarse sand. Detritus.	Water in basin	0.37	1C(0.37)
—	CB-9	NA	No sediment present—not sampled.	Water in basin		
—	CB-14	NA	No sediment present—not sampled.	Water in basin		
June 28, 2007						
CB-13A	CB-19	Sediment	Silt, very fine to coarse sand, some gravel. Detritus.	Water in basin	0.46	2C(0.41)

ppm parts per million
 BRL below laboratory reporting limit
 J indicates estimated value based on data usability assessment
 NA not applicable

Notes:

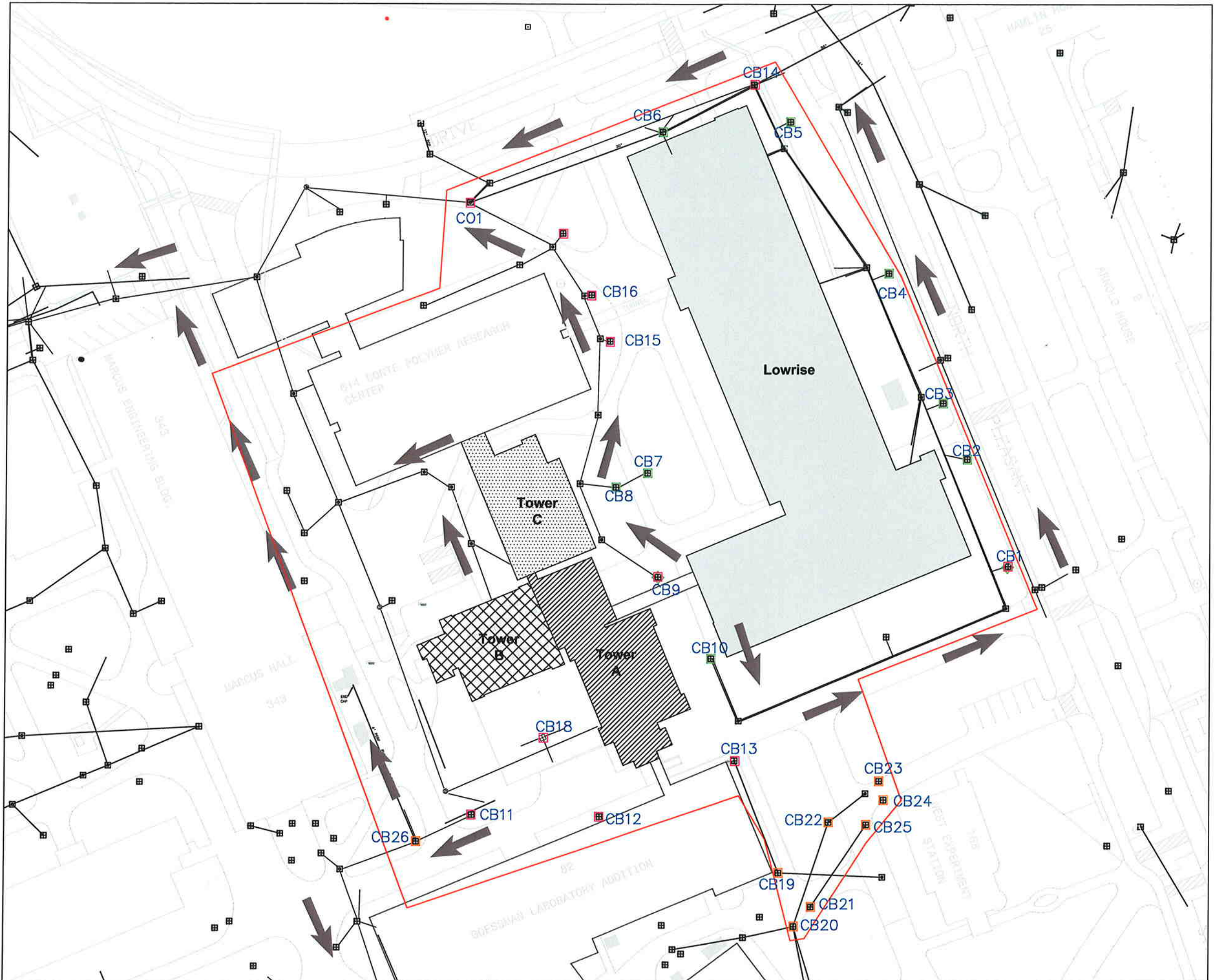
1C Confirmation concentration reported from first column quantification
 2C Confirmation concentration reported from second column quantification

BOLD Indicates an exceedance of the MADEP MCP Method 1, S-1 soil standards (2 ppm).

* See Figure B.4 for approximate catch basin locations.










** Aroclor 1016, 1221, 1232, 1242, 1248, and 1260 also tested. All results below reporting levels, unless noted.

Polychlorinated biphenyl (PCB) concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) Method 8082 (GC/ECD).



Scale:
N.T.S.

LEGEND

-  Sediment Sample (6/28/2007 & 7/5/2007)
-  Sediment Sample (5/1/2007)
-  Sediment Sample (10/11/2006)
-  Surface Water Drainage System Sampling Point Designation
-  Disposal Site Boundary
-  Surface Drainage System
-  Surface Water Drainage Catch Basin
-  Surface Water Drainage Manhole/Clean Out
-  Surface Water Drainage Flow Direction

NOTES

- 1) Base plan created by others and modified by EH&E
- 2) All locations and dimensions are approximate

	Environmental Health & Engineering, Inc. 60 Wells Avenue Newton, MA 02459-3210 TEL: 617-964-8550 FAX: 617-964-8556	CLIENT: University of Massachusetts PROJECT: 15066 Phase I Site Assessment Report LOCATION: Lederle Graduate Research Center, University of Massachusetts Amherst, Amherst, Massachusetts
	TITLE: Approximate Storm Drain System Sediment Sampling Locations, October 2006, May 2007, June 2007, and July, 2007	
	DATE: July 9, 2007	CREATED: WSW

FILE LOCATION: P:\15066\MCF Compliance\CAD_Site Plan\LOGIC LTR BASE_EHE.dwg	FIGURE NUMBER: B.4
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APPENDIX D: PERIMETER AIR MONITORING PLAN

Airborne particulate matter (PM) consists of many different substances suspended in air in the form of particles (solids or liquid droplets) that vary widely in size. Inhalation hazards are caused if the intake of these particles includes intake of vapors and/or contaminated dust. Particles less than 10 micrometers in diameter (PM-10), which include both respirable fine (less than 2.5 micrometers) and coarse (less than 10 micrometers) dust particles, pose the greatest potential health concern because they can pass through the nose and throat and get into the lungs.

During the performance of the planned remediation activities, particulate matter in the form of potentially PCB-affected dust may be generated. The greatest potential for the generation of affected dust is during the excavation of soils and during placement of soils into containers for off-site disposal.

As indicated in the remediation plan, the main dust control mechanism to be employed on the project will be the use of engineering controls (e.g. wetting the soils) and personal protective equipment (PPE;). In addition, particulate air monitoring will be conducted during intrusive or dust-generating activities in the Support Work Zone (SWZ) and perimeter to the SWZ. The SWZ is the area just outside of the active work areas, in designated safe work zones or support zones. Particulate air monitoring will determine if fugitive dust particles are present in the ambient air within the designated SWZ and/or perimeter during active removal activities. A direct-reading particulate meter will be used to monitor airborne particulate concentrations during site activities. Particulate concentrations shall be utilized as an indirect indicator of exposures to on-site receptors.

Dust concentrations in the SWZ will be measured using a suitable real time aerosol particulate monitor capable of determining ambient air fugitive dust concentrations to 0.001 milligrams per cubic meter (mg/m³). Air monitoring shall be conducted while active removal activities are occurring and at a frequency of one reading per hour of activities. Air monitoring equipment will be operated by the site safety officer or by a competent representative under the direction of the site safety officer. Prior to the active removal actions and at periodic points during the project, air monitoring readings will be recorded to document background particulate matter concentrations.

If total particulate concentrations in the SWZ exceed the action limits (as specified below and incorporating background readings) and are sustained (i.e. greater than 5 minutes), then additional dust suppression techniques to mitigate fugitive dust shall be initiated. If applicable, the dust suppression techniques shall involve the application of a fine mist of water over the area creating the fugitive dust condition. The water shall be applied either by small hand held sprayers, sprinklers, or hose nozzles. The water source for dust suppression activities will be from the building's water supply. In the event that the total of airborne particulate cannot be maintained below the action limit in the SWZ, then work activities shall be ceased until sustained readings are below the action limit or the SWZ designation is re-evaluated.

OSHA has published the following permissible exposure limits (8 hour time weighted average) for air contaminants (29 CFR 1910.1000):

Air Contaminant	PEL (8-hour TWA)
Total Dust	15 mg/m ³
Respirable Dust Fraction	5 mg/m ³
PCBs (42% Chlorine)	1 mg/m ³
PCBs (54% Chlorine)	0.5 mg/m ³

In addition, EPA has established a National Ambient Air Quality Standard for PM-10 of 0.150 mg/m³ (24-hr average).

A total airborne particulate action limit has been established for the soil excavation work to be conducted at LGRC with consideration of the specific receptors, PCB concentrations, work activities, and OSHA permissible exposure limits. The action limit applies only to air monitoring within the SWZ and perimeter to the SWZ; an action limit has not been set for the active work zones (exclusion zones) as engineering controls will be used within these zones.

Given the high-occupancy setting of the project and the maximum anticipated PCB concentration in dust that may be generated during abatement activities, a conservative action limit of 0.1 mg/m^3 above background will be maintained during site work. Air monitoring at a location representative of background air conditions (i.e. a location upwind of the work area) will be conducted at the same frequency as SWZ monitoring to obtain data representative of real-time background conditions. The action limit will be used to determine if and when additional engineered controls and/or work stoppages would be necessary.

Air monitoring equipment will be calibrated according to manufacturer's specifications. Weather and other site conditions will affect the normal operation of the equipment, which will require routine maintenance. Weather conditions will be noted on daily air monitoring logs. It is expected that dust or other particulate matter will not be a concern on rainy or misty days.