APPENDIX C

SUMMARY OF MEDIA VOLUMES AND CHARACTERISTICS

APPENDIX C-1

SUMMARY OF MEDIA VOLUMES

APPENDIX C-1 – SUMMARY OF AREAS/VOLUMES OF CONTAMINATED MEDIA PURPOSE OF ANALYSIS

As part of the Feasibility Study (FS) for the Blackburn & Union Privileges Superfund Site (Site) in Walpole, Massachusetts, Sanborn, Head & Associates, Inc. (SHA) estimated areas and/or volumes of media (i.e., soil, sediment, and groundwater) that exhibited concentrations of contaminants of concern (COCs) that exceeded preliminary remediation goals (PRGs), and would likely need to be addressed by the various remedial alternatives being considered. M&E provided revised estimates for Alternatives SO-5 and SO-6. This Appendix provides documentation for these area/volume estimates made as part of the FS.

The methodologies used to estimate areas/volumes of contaminated media varied depending upon remedial alternative, but generally involved delineation of impacted areas using historically observed concentrations of contaminants of concern (COCs) in soil, sediment, and groundwater. Analytical laboratory data collected as part of the Remedial Investigation (RI) were used for this evaluation. The reader is referred to the RI Report[1] (SHA, 2007a) and the RI Addendum Report[2] (SHA, 2007b) for a more in depth presentation and discussion of the analytical data.

Due to the general absence of waste disposal criteria analyses, for the purpose of preliminarily evaluating the potential for excavated soil and sediment to be characteristically hazardous (i.e., toxic), which would have substantial implications with regard to disposal options and costs, concentrations of selected analytes were compared to 20 times the Resource Conservation and Recovery Act (RCRA) toxicity characteristic standards ("20X rule")[3] [40 CFR 261.24 – Toxicity Characteristics]. In lieu of Toxicity Characteristic Leaching Procedure (TCLP) data, analytes that exceeded 20X the TCLP criteria concentration in soil or sediment were considered to be at a high enough concentration, such that the material could potentially be characteristically hazardous for that analyte, and hence were conservatively assumed to require handling as hazardous waste. In areas of the Site where specific data were unavailable, interpolations were made using data from nearby sampling locations to delineate impacted areas.

In many areas of the Site, lead was the only analyte detected in soil/sediment that exceeded 20 times its TCLP criterion, and hence following the above-described rationale, qualifies the material as characteristically hazardous for disposal purposes (the 20X value for lead is 100 mg/kg in soil/sediment).

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[1] Sanborn, Head & Associates, Inc. (SHA), 2007a, "Version 03F Draft Remedial Investigation Report for the Blackburn & Union Privileges Superfund Site, Walpole, Massachusetts," March 2007.

[2] Sanborn, Head & Associates, Inc. (SHA), 2007b, "Version 02 Draft Addendum to the Remedial Investigation Report for the Blackburn & Union Privileges Superfund Site, Walpole, Massachusetts," August 2007.

[3] The "RCRA 20X Rule" is based on the premise that if the total bulk concentration of a contaminant on the RCRA Toxicity Characteristic table is less than 20 times the Toxicity Characteristic Leaching Procedure (TCLP) regulatory limit, then the waste cannot be characteristically toxic for that contaminant due to the 20:1 dilution inherent in the TCLP test. Further, the 20X Rule is conservative (i.e., it commonly predicts that material would be characteristically hazardous, when actual TCLP results show that it is not) in that it assumes that the contaminant present in the material being considered would completely leach out into the TCLP extraction fluid during the TCLP test; typically, this is not the case.

One soil sample, from east of South Street on the former railroad right-of-way, had a detected arsenic concentration; and two sediment samples, from Lewis Pond, had chromium concentrations, exceeding the 20X rule (100 mg/kg for both arsenic and chromium). These three samples also had lead concentrations of greater than 100 mg/kg.

For the purposes of this memo, all impacted soil/sediment that is excavated as part of the various remedial alternatives is assumed to be disposed of off-Site. In cases where the 20X concentrations are exceeded, SHA assumed that the material would be shipped as hazardous waste or would be treated on-Site (to "de-characterize" the waste) prior to transportation and disposal.

This memo also presents an estimate of the volume of groundwater impacted with COC concentrations greater than PRGs for the three main hydrostratigraphic units documented at the Site (e.g., shallow, deep, and bedrock). The methodology used for estimating the groundwater volume involved (for each hydrostratigraphic unit) estimating the volume of the physical aquifer (e.g., glacial till soils) where COC concentrations in groundwater have been observed to exceed the PRGs, and applying an assumed porosity value to calculate the volume of impacted groundwater.

SEDIMENT ON LOT 33-257, LOT 33-360, THE FORMER MILL TAILRACE, AND LEWIS POND

Lot 33-257

A portion of Lot 33-257 (17,000 square feet [ft^2]) is being considered in the remedial alternatives because sediment on the lot contains asbestos and lead concentrations in exceedance of the PRGs (1 percent [%] and 400 mg/kg, respectively).

According to sediment sampling data, sediment on the parcel is impacted with asbestos and/or lead concentrations greater than the PRGs between a depth of 0 and 1 ft (Figure C-1). Because there is only one sediment sampling location (FP-05) on the parcel, SHA used surface topography to estimate the extent of impacted sediment, assuming that the occurrence of impacted sediment was confined to the Neponset River floodplain. On Lot 33-257, SHA delineated the floodplain as the area between the Neponset River, and the 144 ft above mean sea level (amsl) elevation contour. Based on field observations, SHA estimated that the elevation of 144 ft amsl approximately represented the limit of the Neponset River floodplain in this area, and locations above 144 ft amsl would not be impacted with asbestos or lead in exceedance of their respective PRGs.

Assuming a 0 to 1 ft target depth over the estimated area (17,000 ft^2) of impacted sediment on Lot 33-257, a volume of approximately 600 cubic yards of impacted sediment is estimated. Based on the concentration of lead observed at FP-05 (i.e., 657 mg/kg – Figure C-2), and for off-Site sediment disposal cost estimate purposes, SHA assumed that all of the sediment (i.e., 600 cubic yards) would be classified as characteristically hazardous for lead and would require either: on-Site sediment stabilization (to "de-

characterize" the waste) prior to off-Site disposal as non-hazardous waste, or off-Site disposal as hazardous waste. Table C-1 provides a summary of the estimated volume of the impacted sediment.[4]

Lot 33-360

A portion of Lot 33-360 (4,400 ft^2) is being considered in the remedial alternatives because sediment on the lot contains asbestos in exceedance of the PRG (i.e., 1%).

Sediment sampling on Lot 33-360 indicates that sediment on a portion of the parcel is impacted with asbestos at concentrations greater than 1% between a depth of 0 and 1 ft (Figure C-1). Based on observed concentrations of asbestos (Figure C-1), SHA delineated an estimated area of asbestos-impacted sediment on the floodplain portion of Lot 33-360. The area was further delineated using observations during Site reconnaissance that identified the likely margin of the floodplain. SHA assumed that the portion of Lot 33-360 outside of the floodplain would not be impacted with asbestos.

Assuming a 0 to 1 ft target depth over the estimated area (4,400 ft^2) of impacted sediment on Lot 33-360, a volume of approximately 200 cubic yards is estimated. Based on the observed concentrations of lead (i.e., 21 to 730 mg/kg – Figure C-2, and assuming that the portion of Lot 33-360 outside of the floodplain would not be impacted with asbestos, for sediment disposal cost estimate purposes, SHA assumed that all of the sediment (i.e., 200 cubic yards) would be disposed as characteristically hazardous and would require either: on-Site sediment stabilization (to "de-characterize" the waste) prior to disposal as non-hazardous waste, or disposal as hazardous waste. Table C-1 provides a summary of the estimated volume of the impacted sediment.

Former Mill Tailrace

A portion of the Former Mill Tailrace area (1,200 ft^2) is being considered in the remedial alternatives because the sediment contains asbestos in exceedance of the PRG (i.e., 1%).

Sediment sampling in the Former Mill Tailrace area indicated that sediment in this area is impacted with asbestos at concentrations greater than 1% between a depth of 0 and 1 ft (Figure C-1). Assuming a target depth of 1 ft, the estimated volume of impacted soil was 50 cubic yards. Based on the concentrations of lead at TR-3, TR-4, and TR-5 (535, 850, and 410 mg/kg, respectively – Figure C-2), SHA assumed that all of the sediment (i.e., 50 cubic yards) would be considered characteristically hazardous and would require either: on-Site sediment stabilization (to "de-characterize" the waste) prior to disposal as non-hazardous waste, or disposal as hazardous waste. Table C-1 provides a summary of the estimated volume of the impacted sediment.

Lewis Pond

Based on sediment sampling conducted as part of the RI and work completed by Metcalf & Eddy, Inc. (M&E) on behalf of the USEPA[5], SHA delineated three sub-areas to be included in the remedial alternatives because of the presence of asbestos in exceedance of the PRG (i.e., 1%).

[4] For the purposes of this appendix, SHA has typically presented estimated area and volume values to indicate the following level of certainty: <1,000 = 1 significant figure; ≥1,000 = 2 significant figures.

Sediment sampling in and around Lewis Pond indicated that sediment in and adjacent to portions of Lewis Pond is impacted with asbestos at concentrations greater than 1% between a depth of 0 and 2 ft (Figure C-1). The sub-areas were further delineated using observations during Site reconnaissance that identified the likely margin of the floodplain. In the absence of analytical data, SHA assumed that the area outside of the floodplain of the Neponset River would not be impacted with asbestos. The following table summarizes the three sub-areas (designated Lewis Pond Areas 1, 2, and 3 – increasing in the downstream direction).

Lewis Pond Area	**Footprint (ft^2)**	**Estimated Volume of Impacted Sediment (cubic yards)**
1 (upstream)	22,000	1,700
2 (central location – near Lot 33-360)	15,000	1,200
3 (downstream – near West Street Dam)	9,400	700

Based on the observed concentrations of lead (which ranged up to 7,600 mg/kg, and for sediment disposal cost estimate purposes, SHA estimated that all of the sediment would be classified as characteristically hazardous and would require either: on-Site soil stabilization (to "de-characterize" the waste) prior to disposal as non-hazardous waste, or disposal as hazardous waste. Exceedances of the 20X rule for chromium (100 mg/kg in soil) were co-located with lead exceedances of the 20X rule in Lewis Pond Areas 1 and 2. Table C-1 provides a summary of the estimated volume of the impacted sediment.

SOIL EAST OF SOUTH STREET

Based on the results of soil sampling conducted as part of the RI, SHA delineated several sub-areas for consideration in the remedial alternatives because of the presence of arsenic, polycyclic aromatic hydrocarbons (PAHs), asbestos, and trichloroethene (TCE) in exceedance of their respective PRGs. M&E developed subarea #4 since subsurface soils within this area were not included in the original alternatives developed by SHA. Table C-1A presents soil sampling results from the EOSS area which exceed PRGs.

Arsenic & PAHs

Soil impacted with arsenic at concentrations greater than the daycare child scenario PRG (20 mg/kg) is present along the former railroad right-of-way, in the southeast portion of the EOSS area (Figure C-3). Two areas of arsenic-impacted soil were delineated along the former railroad right-of-way: one south and the other north of the Neponset River.

The area south of the Neponset River was delineated using the soil concentration observed at SB-04 (arsenic concentration of 106 mg/kg at a depth of 0 to 1 ft). The area north of the Neponset River was delineated using the arsenic concentrations observed at SB-05 (i.e., 52.1 mg/kg) and SB-06 (i.e., 33.7

[5] Sanborn, Head & Associates, Inc. (SHA), 2007, "Version 03F Draft Remedial Investigation Report for the Blackburn & Union Privileges Superfund Site, Walpole, Massachusetts," March 2007.

mg/kg) at a depth of 0 to 1 ft. The lateral extents of the arsenic impact were assumed to be the margin of the topographically elevated former railroad grade.

Arsenic concentrations in soil samples from slightly greater depths of 2 to 6 ft at each of the above three locations were less than the PRG. Hence, the 0 to 2 ft depth was conservatively assumed to be contaminated. Remedial alternatives entail use of deed restrictions, including: prohibitions against soil excavation and compliance with a soil management plan, and allow for soil disturbance from burrowing animals.

PAH concentrations in soil were also compared to the PAH PRGs to estimate the location and depth of PAH-impacted soil. The estimated area with PAH concentrations above PRGs is depicted on Figure C-4. Based on the daycare child-based risk scenario as indicated above and the potential remedial alternative options, the depth of potential exposure and hence target depth, was assumed to be 0 to 1 ft for SO-5. For alternative SO-6, deeper target depths were conservatively assumed based on existing sample results (0 to 2 ft across most of the EOSS area and deeper depths for selected areas).

The lateral limits of soil impacted with PAHs were delineated using analytical data from soil sampling locations in the areas where PAH concentrations exceeded the PRGs (Figure C-4) and adjacent sampling locations where the concentrations were less than the PRGs. In most cases, the margin of PAH-impacted soil was assumed to be approximately half-way between impacted sampling locations and adjacent unimpacted sampling locations. In general, where soil data were unavailable, the limits of impacted soil were drawn to building perimeters and property lines of the Site, as these areas will not be considered for remediation in this FS. The area of PAH-impacted soil on the former railroad right-of-way largely coincided with the arsenic-impacted soil (which was described above).

As depicted on Figure C-4A, together, arsenic- and PAH-impacted soil targeted for potential remediation in the EOSS area under the SO-5 alternative have a footprint of approximately 67,000 ft^2 and a volume of approximately 2,700 cubic yards (the two areas/volumes overlap considerably as indicated above). Of the total volume estimated for potential arsenic and PAH remediation in the EOSS area, approximately ¼ (800 cubic yards) is estimated for disposal as non-hazardous waste, and approximately ¾ (1,900 cubic yards) is estimated for disposal as characteristically hazardous (based on lead and arsenic concentrations) and would require either: on-Site soil stabilization (to “de-characterize” the waste) prior to disposal as non-hazardous waste, or disposal as hazardous waste. Table C-1 provides a summary of the estimated volume of the impacted soil.

For the SO-6 alternative arsenic-, PAH-, and asbestos-impacted soil targeted for potential remediation in the EOSS have a footprint of approximately 71,900 ft^2 and a volume of approximately 7,800 cubic yards (the two areas/volumes overlap considerably as indicated above). The SO-6 alternative includes excavation across most of the EOSS area to a depth of 2 feet bgs and areas where deeper subsurface soils will be excavated (surrounding SB-14, SB-15, SB-18, UST-1, and UST-2. In the SO-6 alternative, remedial area around SB-15 encompasses the asbestos area. Therefore, SO-6 does not include separate quantities for the asbestos area. Of the total volume estimated for potential arsenic and PAH remediation

in the EOSS area, approximately ¼ (5,100 cubic yards) is estimated for disposal as non-hazardous waste, and approximately ¾ (2,700 cubic yards) is estimated for disposal as characteristically hazardous (based on lead and arsenic concentrations) and would require either: on-Site soil stabilization (to "de-characterize" the waste) prior to disposal as non-hazardous waste, or disposal as hazardous waste. Table C-1 provides a summary of the estimated volume of the impacted soil for the SO-6 alternative, with Table C-1B showing the breakdown by sub-area.

Asbestos

Based on samples collected by M&E in 2006, there was one soil sample collected in the EOSS area with an asbestos concentration in exceedance of 1%. This sample was collected at location I-3.5 from a depth interval of 0.5 to 4 ft (Figure C-5). According to the Existing Data Review and Analysis Report (EDRA) [SHA, 2000[6]]), sampling location I-3.5 is surrounded by six other previous sampling locations where asbestos concentrations were below the PRG (i.e., either non-detect or <1%), indicating that asbestos contamination is of limited extent around M&E's I-3.5 sampling location.

Because no lead data are available for asbestos sampling location I-3.5, SHA reviewed soil data from SB-15 (located approximately 30 ft from location I-3.5 – Figure C-7A. Based on lead concentrations observed in SB-15 (52.8 mg/kg in the 0 to 2 ft depth interval and 253 mg/kg in the 2 to 4 ft depth interval), and for soil disposal costing estimate purposes, SHA assumed that approximately ½ of the soil (i.e., 30 cubic yards) would be disposed as non-hazardous waste. SHA estimated that approximately ½ of the soil (i.e., 30 cubic yards) would be classified as characteristically hazardous and would require either: on-Site soil stabilization (to "de-characterize" the waste) prior to disposal as non-hazardous waste, or disposal as hazardous waste. Table C-1 provides a summary of the estimated volume of the impacted soil.

TCE

As depicted on Figure C-6A, TCE-impacted soil in the EOSS area is isolated around SB-09, where soil was impacted with concentrations of TCE greater than the PRGs (0.097 mg/kg for the daycare child scenario and 0.065 mg/kg for the site worker scenario) in the depth interval of 0 to 6 ft. Because concentrations of TCE in soil in the EOSS area exceeded PRGs for both development scenarios (i.e., the daycare child and site worker), the estimated area of impacted soil was the same for both scenarios.

The lateral extent of the impacted soil surrounding SB-09 was further refined by considering TCE concentrations in soil vapor, which decreased significantly over short distances (i.e., up to three orders of magnitude over approximately 15 ft) from SB-09 (Figure C-6B). The resulting footprint of the TCE-impacted soil was approximately 1,700 ft^2. Based on concentrations of TCE observed at SB-09 and SB-09A, the depth of impacted soil was estimated to be 0 to 6 ft (Figures C-6A and C-6B). The volume of TCE-impacted soil is estimated at approximately 400 cubic yards.

[6] SHA, 2000, Draft Existing Data Review and Analysis Report, Blackburn and Union Privileges Superfund Site, Walpole, Massachusetts. January 2000.

Based on lead concentrations observed at SB-09, SB-10, SB-19, SB-20, SB-59, and SB-60 (Figures C-7A and 7B) and for soil disposal cost estimation purposes, SHA assumed: that approximately ¾ of the soil (i.e., 300 cubic yards) would be disposed as non-hazardous waste and approximately ¼ of the soil (i.e., 100 cubic yards) would be classified as characteristically hazardous (based on lead and TCE concentrations) and would require either: on-Site soil stabilization (to "de-characterize" the waste) prior to disposal as non-hazardous waste, or disposal as hazardous waste. Table C-1 provides a summary of the estimated volume of the impacted soil.

SOIL IN THE AOC – SOIL CAPPED AOC, PAVED AOC, AND SETTLING BASIN #2 CONTAINMENT CELL

Soil-Capped AOC

The Soil-Capped AOC was constructed in the early 1990s as part of an asbestos Removal Action, when asbestos-containing soil (ACS) material from various areas of the Site was placed beneath a 2.5-ft thick soil cap. A buried aluminum plate arch culvert containing the Neponset River approximately bisects the Soil-Capped AOC.

The volume of the soil to be considered beneath the Soil-Capped AOC (and above the water table) was calculated using information obtained from soil boring logs and groundwater level measurements included in the RI Report[7] (Figure C-5). In addition, according to the EDRA, the Soil-Capped AOC was constructed with approximately 2.5 ft of clean sand and topsoil material over the ACS. Hence, SHA assumed that the uppermost 2 ft of the soil cap (equivalent to approximately 6,600 cubic yards) would be considered as clean fill material, and would not require remediation (e.g., could be removed from the Soil-Capped AOC and stockpiled on-Site for future reuse as clean fill material).

The volume of impacted fill material to be considered in the remedial alternatives was estimated using CAD software to calculate the volume between two surfaces over the footprint area of approximately 93,000 ft^2; these surfaces are:

- Upper Surface - the AOC surface elevation (included in the EDRA) minus 2 ft (the "clean" sand and topsoil cap), and
- Lower Surface – the seasonal low water table, or the base of the fill materials, whichever is shallower (i.e., has the higher elevation).

Additionally, the estimated volume of the Neponset River culvert (i.e., approximately 1,500 cubic yards) was subtracted from volume of unsaturated fill soil. The thickness of the soil capped AOC targeted soils (i.e., not including the upper 2 feet of the soil cap) ranged from 0 to approximately 16 ft, with an average of approximately 10 ft. The resulting calculated volume of ("unsaturated") asbestos-impacted fill soil beneath the Soil-Capped AOC was estimated to be approximately 35,000 cubic yards.

[7] Sanborn, Head & Associates, Inc. (SHA), 2007, "Version 03F Draft Remedial Investigation Report for the Blackburn & Union Privileges Superfund Site, Walpole, Massachusetts," March 2007.

Based on observed lead concentrations (Figures C-7A and C-7B), and for soil disposal cost estimation purposes, SHA estimated that approximately ½ of the soil (i.e., 17,500 cubic yards) would be disposed as non-hazardous waste and approximately ½ of the soil (i.e., 17,500 cubic yards) would be classified as characteristically hazardous and would require either: on-Site soil stabilization (to "de-characterize" the waste) prior to disposal as non-hazardous waste, or disposal as hazardous waste. Table C-1 provides a summary of the estimated volume of impacted soil.

Asphalt-Capped AOC

The volume of impacted fill material in the Asphalt-Capped AOC are to be considered in the remedial alternatives was estimated using CAD software to calculate the volume between two surfaces over the footprint area of approximately 14,000 ft^2; these surfaces are:

- Upper Surface - the existing ground surface elevation, and
- Lower Surface – the seasonal low water table, or the base of the fill materials, whichever is shallower (i.e., has the higher elevation).

The thickness of the Asphalt-Capped AOC fill volume ranged from 0 to approximately 10 ft, with an average of approximately 4 ft. The estimated volume of impacted soil was approximately 2,500 cubic yards.

For off-Site soil disposal cost estimate purposes, and based on concentrations of lead observed in soil at locations indicated on Figure C-7B, SHA assumed that approximately ⅔ of the soil (i.e., 1,700 cubic yards) would be disposed as non-hazardous waste, and that approximately ⅓ of the soil (i.e., 800 cubic yards) would be classified as characteristically hazardous. The characteristically hazardous waste would require either: on-Site soil stabilization (to "de-characterize" the waste) prior to off-Site disposal as non-hazardous waste, or off-Site disposal as hazardous waste. Table C-1 provides a summary of the estimated volume of impacted soil.

Settling Basin #2 Containment Cell

The Settling Basin #2 Containment Cell (SB2CC) occupies an area of land located west of the former mill building with an estimated footprint of approximately 14,000 ft^2. The SB2CC is a polyethylene (HDPE)-lined and -capped containment cell constructed in the early 1990s as part of an asbestos Removal Action when stabilized soil material excavated from the Former Mill Tailrace was consolidated inside the HDPE liner and covered with 2.5 ft thick clean soil cap.

The volume of the SB2CC considered for remediation was estimated by using CAD software to calculate the volume encompassed between the pre- and post-Removal Action topographic surfaces (provided in the EDRA) over the 14,000 ft^2 footprint. Like the Soil-Capped AOC, the SB2CC's soil cap (equivalent to approximately 1,000 cubic yards) would be considered as clean fill material, and would not require remediation (e.g., could be removed and stockpiled on-Site for future reuse as clean fill material). The resulting calculated volume of fill soil in the SB2CC was 1,500 cubic yards. The thickness of the SB2CC fill volume ranged from 0 to approximately 15 ft, with an average of approximately 3 ft.

According to the EDRA, soil material placed in the SB2CC was stabilized with Portland cement during its construction. However, there are no post-stabilization results available to confirm that the leachable concentrations would pass TCLP criteria as non-hazardous. Based on this information and for off-Site soil disposal cost estimate purposes, SHA assumed that the entire volume of the SB2CC (i.e., 1,500 cubic yards) would be disposed as non-hazardous waste. Table C-1 provides a summary of the estimated volume of impacted soil.

ESTIMATED VOLUME OF IMPACTED GROUNDWATER

The volume of groundwater impacted with concentrations greater than the PRGs was estimated for each of the hydrostratigraphic units (i.e., shallow, deep, and bedrock). Table C-2 contains a summary of the impacted groundwater volumes for each of the hydrostratigraphic units.

Shallow

As described in the RI Report (SHA, 2007a), the shallow aquifer is composed of fill material (primarily reworked sand and sand/gravel material) and ice-contact sand/sand and gravel. The lateral extent of the impacted shallow groundwater included locations where groundwater concentrations exceeded PRGs. Additionally, surface water data were compared to surface water PRGs to indicate locations with historical exceedances. Based on these criteria, two areas of impacted shallow groundwater were delineated: one west of South Street beneath the AOC and extending west-northwest to the Former Mill Tailrace, and a second smaller area east of South Street and south of the Cosmec buildings. Figure C-8 indicates the location of the impacted shallow groundwater. Tables C-3 and C-4 contain groundwater quality data compared to PRGs. Tables C-5 and C-6 present surface water quality data compared to PRGs.

CAD software was used to calculate the volume of the saturated shallow aquifer by calculating the volume encompassed between the groundwater table elevation (using September 2006 water levels) and the top of the glacial till unit (obtained from soil boring logs included in the RI Report – SHA, 2007a). Using this method, (and an estimated footprint of the impacted groundwater west of South Street of approximately 167,000 ft^2), the volume of the impacted shallow aquifer west of South Street was estimated at 64,000 cubic yards. The thickness of the impacted aquifer ranged from approximately 0 to 23 ft, with an average of approximately 10 ft. The estimated footprint of the impacted groundwater east of South Street was approximately 5,400 ft^2, the volume of the impacted shallow aquifer east of South Street was estimated at 3,100 cubic yards. The thickness of impacted aquifer ranged from approximately 11 to 19 ft, with an average of approximately 15 ft.

The total footprint of impacted shallow groundwater at the Site is approximately 170,000 ft^2, and the total volume of impacted shallow aquifer at the Site is estimated at approximately 67,000 cubic yards. Assuming an average shallow aquifer porosity of 30%[8], the volume of shallow groundwater with COC concentrations greater than PRGs is estimated at 4.0 million gallons.

[8] See Table HC-1 of the RI Report for more discussion on porosity of each of the hydrostratigraphic units.

Deep

As described in the RI Report (SHA, 2007a), the deep aquifer is composed of glacial till material (primarily a dense, heterogeneous mix of clay, silt, sand, gravel, and lesser amounts of clay and boulders). The lateral extent of the deep groundwater impacted with COC concentrations exceeding PRGs was delineated to be coincident with the estimated plume of pH greater than 9.0 (RI Addendum Report – SHA, 2007b), with the inclusion of SH-03D, which had historical exceedances of the manganese PRG. Figure C-9 indicates the location of the impacted deep groundwater. Tables C-3 and C-4 present groundwater quality data compared to PRGs.

Because the glacial till in this area of the Site is fully saturated, the vertical extent of the impacted deep aquifer was the entire thickness of the till unit. CAD software was used to calculate the volume of aquifer contained between the top and bottom of the till unit over the estimated footprint of impacted deep groundwater (i.e., 71,000 ft^2). The thickness of impacted aquifer ranged from approximately 12 to 57 ft, with an average of approximately 29 ft.

Using this method, (and an estimated footprint of the impacted groundwater of approximately 71,000 ft^2), the volume of the impacted deep aquifer was estimated at 76,000 cubic yards. The thickness of the impacted aquifer ranged from approximately 12 to 57 ft, with an average of approximately 29 ft. Assuming an average deep aquifer porosity of 20%[9], the volume of shallow groundwater with COC concentrations greater than PRGs is estimated at 3.0 million gallons.

Bedrock

As described in the RI Report (SHA, 2007a), the bedrock aquifer is composed of quartzofeldspathic sandstone, siltstone, pebble conglomerate, and granule conglomerate. The lateral extent of the bedrock groundwater impacted with COC concentrations exceeding PRGs was delineated to be coincident with the estimated plume of pH greater than 9.0 (RI Addendum Report – SHA, 2007b).

Based on these criteria, two areas of impacted bedrock groundwater were delineated west of South Street: one beneath the AOC based on data from well SH-01R, and the second located just to the north of the AOC based on data from well SH-17R. Figure C-10 indicates the location of the impacted bedrock groundwater. Tables C-3 and C-4 present groundwater quality data compared to PRGs.

Monitoring wells SH-05R-A and SH-05-R-B were not included within the lateral extent of the impacted groundwater because these wells are outside the area of elevated pH and the only PRG exceedances observed in these wells are relatively modest exceedances of arsenic (up to a maximum of 24 mg/L in both SH-05R-A and SH-05R-B). Monitoring wells SH-05R-A and SH-05R-B were installed to assess deep bedrock groundwater conditions (i.e., below the screened interval of the other bedrock wells), and although arsenic concentrations modestly exceeding the PRG have been observed in these well, arsenic concentrations are similar to those observed in SH-19R (a well considered representative of background water quality conditions).

[9] See Table HC-1 of the RI Report for more discussion on porosity of each of the hydrostratigraphic units.

The vertical extent of impacted bedrock groundwater was assumed to extend from the top of bedrock to a maximum depth equal to the top of the well screen in SH-05R-A (the shallower of the two wells SH-05R-A and SH-05R-B, and assumed to be unimpacted by Site activities). The elevation of the top of the screen in SH-05R-A is approximately 46 ft amsl (approximately 25 feet below the top of bedrock at this location). CAD software was used to calculate the volume contained between the top of the bedrock aquifer and 46 ft amsl over the estimated footprint of impacted deep groundwater (i.e., total for two areas approximately 23,000 ft^2). The thickness of impacted bedrock aquifer ranged from approximately 72 to 84 ft in the north sub-area, to 55 to 84 ft in the south sub-area. The average thickness was approximately 78 ft for the north sub-area, and 67 ft for the south sub-area.

This calculation yielded a total aquifer volume of approximately 62,000 cubic yards. To estimate the portion occupied by groundwater, an assumed porosity of 5%[10] was applied to the total volume. The volume of bedrock groundwater with COC concentrations greater than PRGs was estimated to be 600,000 gallons.

[10] Specific yield value from Driscoll, 1986.

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FIGURES

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Figure C-7B	Lead Concentrations in Lower Soils Reviewed for Possible Off-Site Disposal - EOSS Area and AOC
Figure C-8	Shallow Groundwater (and Surface Water) With COC Concentrations Greater Than PRGs
Figure C-9	Deep Groundwater With COC Concentrations Greater Than PRGs
Figure C-10	Bedrock Groundwater With COC Concentrations Greater Than PRGs

TABLE C-1
Contaminated Media Volume Estimate Summary
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Sub-Area	Contaminated Soil/Sediment Footprint (ft^2)	Contaminated Soil/Sediment Target Depth (ft)	Contaminated Soil/Sediment Volume (cu yards)	Estimated Potentially Hazardous Portion (if excavated) (cu yards)	Estimated Potentially Non-Hazardous Portion (cu yards)
Sediment/Neponset River Floodplain					
Lot 33-257	17,000	0 to 1	600	600	0
Lot 33-360	4,400	0 to 1	200	200	0
Former Mill Tailrace	1,200	0 to 1	50	50	0
Lewis Pond #1	22,000	0 to 2	1,700	1,700	0
Lewis Pond #2	15,000	0 to 2	1,200	1,200	0
Lewis Pond #3	9,400	0 to 2	700	700	0
East of South Street (EOSS)					
EOSS (As and PAHs) [Alt. SO-5]	67,000	0 to 2 for RR ROW; 0 to 1 for remainder	2,700	1,900	800
EOSS (Asbestos) [Alts. SO-4 & 5]	400	0 to 4	60	30	30
EOSS (TCE) [Alts. SO-4, 5 & 6]	1,700	0 to 6	400	100	300
EOSS (As, PAHs, and asbestos) [Alt. SO-6]	71,900	varies	7,800	2,700	5,100
Area of Containment (AOC)					
Soil-Capped AOC	93,000	2 to ~18 average thickness: 10	35,000	17,500	17,500
Asphalt-Capped AOC	19,000	0 to ~10 average thickness: 4	2,500	800	1,700
SB2CC	14,000	2 to ~17 average thickness: 3	1,500	0	1,500

TABLE C-1
Contaminated Media Volume Estimate Summary
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Notes:

1. Soil volumes have been rounded to indicate the following estimated level of certainty:
   <1,000 cubic yards = 1 significant figure
   ≥1,000 cubic yards = 2 significant figures
   The potentially hazardous/non-hazardous soil volumes for the Soil-Capped AOC are shown to 3 significant figures, because each is assumed to be 50% of the total volume of 35,000 cubic yards.
2. Lot 33-257 sub-area assumes a target sediment depth of 0 to 1 ft. For potential disposal purposes, it is assumed that all of the sediment would be characteristically hazardous and contains asbestos.
3. Lot 33-360 sub-area assumes a target sediment depth of 0 to 1 ft. For potential disposal purposes, it is assumed that all of the sediment would be characteristically hazardous and contains asbestos.
4. Lewis Pond sub-areas Nos. 1, 2, and 3 assume a target sediment depth of 2 ft. For potential disposal purposes, it is assumed all the sediment in the Lewis Pond Sub- Areas would be characteristically hazardous and contains asbestos.
5. Former Mill Tailrace sub-area assumes a target sediment depth of 1 ft. For disposal purposes, it is assumed that all of the sediment would be characteristically hazardous and contains asbestos.
6. EOSS (Arsenic and PAHs) sub-area (0 to 2 ft target depth for RR ROW; 0 to 1 ft for remainder). For potential disposal purposes, it is assumed that approximately 25% of the soil would be non-hazardous and approximately 75% would be characteristically hazardous.
7. EOSS (Asbestos) sub-area (0 to 4 ft target depth). For potential disposal purposes, it is assumed that approximately 1/2 of the soil would be non-hazardous, approximately 1/2 would be characteristically hazardous, and all of the soil contains asbestos.
8. EOSS (TCE) sub-area (0 to 6 ft target depth). For potential disposal purposes, it is assumed that approximately 75% of the soil would be non-hazardous and approximately 25% would be characteristically hazardous.
9. EOSS (As, PAHs, and asbestos) assumes excavation of 2 ft of soil across most of EOSS area, as well as deeper excavations to remove contaminated soils exceeding PRGs at various depths (see Table C-1B for detail by sub-area)
10. The thickness of contaminated soil beneath the Soil-Capped AOC sub-area is variable. Depth range indicated excludes 2 ft of the clean sand cap material that would be stockpiled on Site for reuse. See text of report for more details. For potential disposal purposes, it is assumed that approximately 1/2 of the soil would be nonhazardous and approximately 1/2 would be characteristically hazardous. For disposal purposes, it is assumed that all of the soil contains asbestos.
11. The thickness of the contaminated soil beneath the Paved AOC sub-are is variable. For potential disposal purposes, it is assumed that approximately 2/3 of the soil would be non-hazardous, approximately 1/3 would be characteristically hazardous and all of the soil contains asbestos.
12. The thickness of the SB2CC is variable. Depth range indicated excludes 2 ft of the clean sand cap material that would be stockpiled on Site for reuse. For potential disposal purposes, it is assumed all of the material would be non-hazardous and contains asbestos.

TABLE C-1A. SOIL SAMPLES EXCEEDING PRGs

Refer to the Draft RI report (SHA, 2007) for the complete presentation of soil sampling results.
The following is a summary of only which exceeded site PRGs associated with
appropriate exposure scenarios (see Appendix B-3 of this report).

COC	PRG (mg/kg)	Location	Sample Depth (ft bgs)	Sample Date	Detected Concentration (mg/kg)	Data Source [1]
Trichloroethene	0.065					
		SS-09	0 - 1	4/23/2001	0.17	RI Table 11D
		SB-09/S-2-3	2 - 6	4/23/2001	4.5	RI Table 12D; RI Addendum Table 5
		SB-09A/S-2	2 - 5.5	9/7/2006	21	RI Addendum Table 5
Arsenic	20					
		SS-04	0 - 1	3/21/2001	106	RI Table 11B
		SS-05	0 - 1	3/19/2001	52.1	RI Table 11B
		SS-06	0 - 1	3/15/2001	33.7	RI Table 11B
Lead	400					
		SS-18	0 - 1	4/11/2001	1540	RI Table 11B
		SB-18/S-2-3	2 - 5.4	4/11/2001	574	RI Table 12B
		SS-23	0 - 1	4/11/2001	5620	RI Table 11B
Benzo(a)anthracene	5.1					
		SS-04	0 - 1	3/21/2001	11	RI Table 11C
		SS-05	0 - 1	3/19/2001	22	RI Table 11C
		SS-09	0 - 1	4/23/2001	8.6	RI Table 11C
		SB-09/S-2-3	2 - 6	4/23/2001	39	RI Table 12C; RI Addendum Table 4
		SB-14/S-3-4	4 - 8	4/13/2001	83	RI Table 12C; RI Addendum Table 4
		SB-15/S-2-3	2 - 6	4/16/2001	20	RI Table 12C; RI Addendum Table 4
		SS-17	0 - 1	4/5/2001	23	RI Table 11C
		SS-18	0 - 1	4/11/2001	19	RI Table 11C
		SB-18/S-2-3	2 - 5.4	4/11/2001	6.2	RI Table 12C; RI Addendum Table 4
		SS-20	0 - 1	6/12/2001	20	RI Table 11C
		SS-21	0 - 1	4/2/2001	9.4	RI Table 11C
		SS-26	0 - 1	3/30/2001	20	RI Table 11C
		UST-1/S-1-2	0.2 - 5	4/4/2001	12	RI Table 12C; RI Addendum Table 4
		UST-2/S-1-2	0.3 - 4	4/5/2001	8.9	RI Table 12C; RI Addendum Table 4
Benzo(a)pyrene	2					
		SS-04	0 - 1	3/21/2001	11	RI Table 11C
		SS-05	0 - 1	3/19/2001	18	RI Table 11C
		SS-09	0 - 1	4/23/2001	9.3	RI Table 11C
		SB-09/S-2-3	2 - 6	4/23/2001	35	RI Table 12C; RI Addendum Table 4
		SB-14/S-3-4	4 - 8	4/13/2001	72	RI Table 12C; RI Addendum Table 4
		SS-15	0 - 1	4/16/2001	4.2	RI Table 11C
		SB-15/S-2-3	2 - 6	4/16/2001	21	RI Table 12C; RI Addendum Table 4
		SS-17	0 - 1	4/5/2001	33	RI Table 11C
		SS-18	0 - 1	4/11/2001	19	RI Table 11C
		SB-18/S-2-3	2 - 5.4	4/11/2001	6.5	RI Table 12C; RI Addendum Table 4
		SS-20	0 - 1	6/12/2001	15	RI Table 11C
		SS-21	0 - 1	4/2/2001	10	RI Table 11C
		SS-26	0 - 1	3/30/2001	18	RI Table 11C
		UST-1/S-1-2	0.2 - 5	4/4/2001	16	RI Table 12C; RI Addendum Table 4
		UST-1/S-3-4	5 - 9	4/4/2001	4	RI Table 12C; RI Addendum Table 4
		UST-2/S-1-2	0.3 - 4	4/5/2001	12	RI Table 12C; RI Addendum Table 4

TABLE C-1A. SOIL SAMPLES EXCEEDING PRGs

Refer to the Draft RI report (SHA, 2007) for the complete presentation of soil sampling results.
The following is a summary of only which exceeded site PRGs associated with
appropriate exposure scenarios (see Appendix B-3 of this report).

COC	PRG (mg/kg)	Location	Sample Depth (ft bgs)	Sample Date	Detected Concentration (mg/kg)	Data Source [1]
Benzo(b)fluoranthene	5.1					
		SS-04	0 - 1	3/21/2001	19	RI Table 11C
		SS-05	0 - 1	3/19/2001	30	RI Table 11C
		SS-09	0 - 1	4/23/2001	11	RI Table 11C
		SB-09/S-2-3	2 - 6	4/23/2001	39	RI Table 12C; RI Addendum Table 4
		SB-14/S-3-4	4 - 8	4/13/2001	89	RI Table 12C; RI Addendum Table 4
		SB-15/S-2-3	2 - 6	4/16/2001	25	RI Table 12C; RI Addendum Table 4
		SS-17	0 - 1	4/5/2001	34	RI Table 11C
		SS-18	0 - 1	4/11/2001	21	RI Table 11C
		SB-18/S-2-3	2 - 5.4	4/11/2001	6.7	RI Table 12C; RI Addendum Table 4
		SS-20	0 - 1	6/12/2001	17	RI Table 11C
		SS-21	0 - 1	4/2/2001	11	RI Table 11C
		SS-26	0 - 1	3/30/2001	18	RI Table 11C
		UST-1/S-1-2	0.2 - 5	4/4/2001	16	RI Table 12C; RI Addendum Table 4
		UST-2/S-1-2	0.3 - 4	4/5/2001	15	RI Table 12C; RI Addendum Table 4
Dibenz(a,h)anthracene	0.51					
		SS-04	0 - 1	3/21/2001	1.2	RI Table 11C
		SS-05	0 - 1	3/19/2001	3.4	RI Table 11C
		SS-09	0 - 1	4/23/2001	0.96	RI Table 11C
		SB-09/S-2-3	2 - 6	4/23/2001	3.5	RI Table 12C; RI Addendum Table 4
		SB-14/S-3-4	4 - 8	4/13/2001	6.1	RI Table 12C; RI Addendum Table 4
		SB-15/S-2-3	2 - 6	4/16/2001	1.8	RI Table 12C; RI Addendum Table 4
		SS-17	0 - 1	4/5/2001	2.1	RI Table 11C
		SS-18	0 - 1	4/11/2001	2.2	RI Table 11C
		SS-20	0 - 1	6/12/2001	1.9	RI Table 11C
		SS-21	0 - 1	4/2/2001	0.99	RI Table 11C
		SS-26	0 - 1	3/30/2001	1.8	RI Table 11C
		UST-1/S-1-2	0.2 - 5	4/4/2001	1.5	RI Table 12C; RI Addendum Table 4
		UST-2/S-1-2	0.3 - 4	4/5/2001	1.1	RI Table 12C; RI Addendum Table 4
Indeno(1,2,3-cd)pyrene	5.1					
		SS-05	0 - 1	3/19/2001	13	RI Table 11C
		SB-09/S-2-3	2 - 6	4/23/2001	13	RI Table 12C; RI Addendum Table 4
		SB-14/S-3-4	4 - 8	4/13/2001	21	RI Table 12C; RI Addendum Table 4
		SB-15/S-2-3	2 - 6	4/16/2001	6.5	RI Table 12C; RI Addendum Table 4
		SS-17	0 - 1	4/5/2001	8.1	RI Table 11C
		SS-18	0 - 1	4/11/2001	10	RI Table 11C
		SS-20	0 - 1	6/12/2001	9.9	RI Table 11C
		SS-26	0 - 1	3/30/2001	6.4	RI Table 11C
		UST-1/S-1-2	0.2 - 5	4/4/2001	5.6	RI Table 12C; RI Addendum Table 4

Notes

1. Sample depths taken from RI Addendum, Appendix G, Table 5

TABLE C-1B
Alternative SO-6 Contaminated Soil Quantities [1]
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Sub-Area	Approximate Dimensions (ft x ft)	Contaminated Soil Footprint (ft^2)	Contaminated Soil/Sediment Target Depth (ft)	Contaminated Soil/Sediment Volume (cu yards)	Estimated Potentially Hazardous Portion (if excavated) (cu yards)	Estimated Potentially Non-Hazardous Portion (cu yards)
East of South Street (EOSS)						
Shallow Area #3	NA	59,700 [2]	0 to 2	4,500	1,700	2,800
Deeper Areas						
SB-18 Area	40 x 40	1,600	0 to 6	400	400	0
UST-1 Area	60 x 20	1,200	0 to 9	400	0	400
UST-2 Area	20 x 30	600	0 to 4	100	0	100
SB-15 Area [3]	65 x 60	3,900	0 to 6	900	600	300
EOSS (TCE)	NA	1,700	0 to 6	400	100	300
EOSS Area #4 [4]	70 x 70	4,900	0 to 8	1,500	0	1,500

Notes
(1) Alternative SO-6 includes excavation of 2 ft of soil across most of EOSS area, as well as deeper excavations to remove contaminated soils exceeding PRGs at various depths
(2) Footprint does not include shallow soils at locations where deeper soils will be excavated also.
(3) SB-15 Area encompasses Asbestos Area
(4) EOSS Area #4 was not included in SO-5 because only deeper soils are contaminated at this location. However, for practical purposes, all soils are assumed to be excavated and disposed of from this footprint

TABLE C-2
Groundwater Volume Estimate Summary
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Aquifer Unit	Estimated Impacted Aquifer Footprint (ft^2)	Estimated Thickness of Impacted Aquifer (ft)	Estimated Impacted Groundwater Volume (gallons)
Shallow	170,000	West of South Street 0 to 23 (average: 10) East of South Street 11 to 19 (average: 15)	4,000,000
Deep	71,000	12 to 57 (average: 29)	3,000,000
Bedrock	23,000	North 72 to 84 (average: 78) South 55 to 84 (average: 67)	600,000

Notes:
1. The aquifer areas and groundwater volumes have been shown with a level of certainty of 1 significant figure.

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
		SH-01D	SH-01D	SH-01D	SH-01D	SH-02D	SH-02D	SH-02D	SH-03D	SH-03D	SH-03D	SH-03D	SH-04D	SH-04D	SH-04D	SH-05D	SH-05D	SH-05D	SH-05D
		9/12/2001	5/22/2002	10/29/2003	10/3/2006	9/13/2001	5/23/2002	10/30/2003	9/12/2001	5/23/2002	11/3/2003	10/3/2006	9/11/2001	5/21/2002	11/5/2003	9/11/2001	5/21/2002	11/4/2003	10/2/2006
AVOCs																			
Benzene	5	810	340	130	41	83	180	3.8	<0.25	<0.22	<0.15	<2	<0.25	<0.22	<0.15	<0.25	<0.22	<0.15	<2
Ethylbenzene	700	350	400	310	200	47	58	<40	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total AVOCs		3,290	2,160	1,432	672	407	675	3.8	-	-	-	-	-	-	-	-	-	-	-
CVOCs																			
Methylene chloride	5	<7	<26	R	<40	<4	<10	<31	<0.2	<0.21	<0.25	<2	<0.2	<0.21	<0.25	<0.2	<0.21	<0.25	<2
Trichloroethene	5	<5.2	<13	R	<40	<5.2	<13	<3.6	0.41	0.45	0.38	<2	<0.26	<0.26	<0.18	2.2	2.2	3.2	2.1
Total CVOCs		-	-	-	-	-	-	-	0.41	0.45	0.38	-	-	-	-	2.2	2.2	-	2.1
Total VOCs		3,470	2,360	1,504	852	407	735	3.8	0.41	0.45	0.38	-	-	-	-	2.2	2.2	-	2.1
PAHs																			
Benzo(a)anthracene	0.1	<1.3	<2.5	<21	0.16	<0.51	<1	<0.06	<0.051	<0.052	<0.052	<0.01	<0.05	<0.05	<0.052	<0.053	<0.057	<0.053	<0.01
Benzo(a)pyrene	0.2	<0.23	<0.12	<1.2	0.10	0.17	<0.2	<0.0036	<0.0029	<0.0018	<0.003	<0.01	<0.0028	<0.0017	<0.003	<0.003	<0.0019	<0.0031	<0.01
Benzo(b)fluoranthene	0.1	<1.3	<2.5	<21	0.026	<0.51	<1	<0.06	<0.051	<0.052	<0.052	<0.01	<0.05	<0.05	<0.052	<0.053	<0.057	<0.053	<0.01
Dibenz(a,h)anthracene	0.1	0.20	<0.12	<0.88	<0.01	0.074	<0.052	<0.0026	<0.0044	<0.0026	<0.0022	<0.01	<0.0043	<0.0025	<0.0022	<0.0046	0.0038	<0.0022	<0.01
Indeno(1,2,3-cd)pyrene	0.1	<1.3	<2.5	<21	0.023	<0.51	<1	<0.06	<0.051	<0.052	<0.052	<0.01	<0.05	<0.05	<0.052	<0.053	<0.057	<0.053	<0.01
Methylnaphthalene (2-)	10	51	220	270	230	140	60	0.23	<0.051	<0.052	<0.052	<0.01	<0.05	<0.05	<0.052	<0.053	<0.057	<0.053	<0.01
Naphthalene	15	1,100	3,100	2,400	1,800	650	670	2.7	0.24	<0.052	0.064	<0.01	<0.05	<0.05	<0.052	<0.053	<0.057	<0.053	<0.01
B(a)P Equivalent Concentration	0.063*	0.2	0	0	0.1209	0.244	0	0	0	0	0	0	0	0	0	0	0.0038	0	0
Total PAHs		1,178.5	3,380.4	2,738	2,132.749	870.244	750.1	7.2	0.24	-	0.064	-	-	-	-	-	0.0038	-	-
Other SVOCs																			
bis(2-Ethylhexyl)phthalate	6	<30	<19	<210	<1	<6	<4.8	1.5	<0.6	<0.96	<0.89	<1	<0.59	<0.93	<2.4	<0.63	<1.1	<0.71	<1
Carbazole	1.8	<30	<19	<210	9.5	<6	7.6	1.2	<0.6	<0.96	<0.52	<0.01	<0.59	<0.93	<0.52	<0.63	<1.1	<0.53	<0.01
Methylphenol (4-)	49	43	R			9.2	33		<2	<2.1			<2	<2		<2.1	<2.3		
Total Other SVOCs		154	-	-	9.5	15.4	96.1	2.7	-	-	-	-	-	-	-	-	-	-	-
Total SVOCs		1,332.5	3,380.4	2,738	2,142.249	885.644	846.2	9.9	0.24	-	0.064	0.000	-	-	-	-	0.0038	-	-
Metals																			
Antimony	6	<50	42.0	<25	<50	<11.1	<5	<1	<11.1	<1.1	<1	<0.5	<11.1	<1.1	<1	<11.1	<1.1	<1	<0.5
Arsenic	10	812	650	57.0	660	65.2	210	9.8	0.41	3.5	1.2	0.89	0.47	<0.59	0.39	0.33	<0.45	0.27	0.74
Chromium	100	22.1	21.0	<25	<50	8.5	24.0	1.7	<1.1	22.0	7.7	2.2	4.6	2.2	3.6	6.3	<1.1	<1	0.66
Lead	15	7.8	<5.1	<25	<50	95.6	<9.5	<1	10.4	4.4	5.6	2.7	1.1	<0.5	1.5	<1.1	<0.27	<1	<0.5
Manganese	300	1,620	850	<250	<500	1,180	770	9,100	1,720	1,200	1,000	500	101	<46	150	62.6	<51	64.0	66.0
Nickel	210	412	280	330	170	258	630	1,000	15.7	18.0	<10	3.7	9.4	<1.8	<10	4.2	<4	<10	5.8
Vanadium	45	3,750	3,700	2,600	2,400	234	550	6.9	<11.1	22.0	5.0	1.2	<11.1	1.4	2.0	<11.1	<1.1	<1	<1
Zinc	3100	540	<610	1,600	1,800	<78.5	<50	13.0	<85	43.0	24.0	<12	<37.5	<11	<10	<28.5	<13	<10	<5.8

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
		SH-06D	SH-06D	SH-06D	SH-07D	SH-07D	SH-07D	SH-08D	SH-08D	SH-08D	SH-09D	SH-09D	SH-09D	SH-12D	SH-12D	SH-12D	SH-14D	SH-14D	SH-14D
		9/6/2001	5/22/2002	10/29/2003	9/7/2001	5/22/2002	10/30/2003	9/7/2001	5/20/2002	10/29/2003	9/7/2001	5/23/2002	10/28/2003	9/12/2001	5/17/2002	11/3/2003	9/10/2001	5/20/2002	11/4/2003
AVOCs																			
Benzene	5	3.7	3.0	5.1	13	9.2	8.2	77	49	46	<1.2	<0.22	<0.15	<0.25	<0.22	<0.15	<0.25	<0.22	<0.15
Ethylbenzene	700	11	12	12	10	<40	<40	47	34	30	<10	<2	<2	<2	<2	<2	<2	<2	<2
Total AVOCs		107.7	119.4	125.1	78	9.2	8.2	470	307	281	-	-	-	-	-	-	-	-	-
CVOCs																			
Methylene chloride	5	<2.3	<3.5	<7.8	<2	<4.2	<31	<1.2	<0.21	<7.8	<1	<0.21	<1.6	<0.2	<0.21	<0.25	<0.2	<0.21	<0.25
Trichloroethene	5	<2.6	<1.3	<0.9	<2.6	<5.2	<3.6	<1.3	<0.26	<0.9	<1.3	<0.26	<0.18	<0.26	<0.26	<0.18	<0.26	<0.26	<0.18
Total CVOCs		-	-	-	-	-	-	-	2.1	-	-	-	-	-	-	-	-	-	-
Total VOCs		157.7	188.4	218.3	164	141.2	95.2	470	309.13	281	-	5.3	7.4	-	-	-	-	-	-
PAHs																			
Benzo(a)anthracene	0.1	0.44	0.83	1.1	0.053	0.075	<0.1	<0.051	<0.05	<0.41	<0.05	<0.053	<0.052	<0.051	<0.05	<0.056	<0.053	<0.051	<0.053
Benzo(a)pyrene	0.2	0.32	0.45	0.72	0.031	<0.043	0.036	0.010	<0.004	<0.024	0.0068	0.0029	0.017	<0.0029	<0.0017	<0.0033	<0.003	<0.0017	<0.0031
Benzo(b)fluoranthene	0.1	0.26	0.23	<0.54	<0.051	<0.05	<0.1	<0.051	<0.05	<0.41	<0.05	<0.053	<0.052	<0.051	<0.05	<0.056	<0.053	<0.051	<0.053
Dibenz(a,h)anthracene	0.1	0.020	0.048	0.074	0.0051	<0.0077	<0.0044	<0.0044	<0.0025	<0.018	<0.0043	<0.0027	<0.0022	<0.0044	<0.0025	<0.0024	<0.0046	<0.0026	<0.0023
Indeno(1,2,3-cd)pyrene	0.1	0.058	0.12	<0.54	<0.051	<0.05	<0.1	<0.051	<0.05	<0.41	<0.05	<0.053	<0.052	<0.051	<0.05	<0.056	<0.053	<0.051	<0.053
Methylnaphthalene (2-)	10	26	21	42	8.7	11	10	62	62	62	0.084	<0.053	<0.052	<0.051	<0.05	<0.056	<0.053	<0.051	<0.053
Naphthalene	15	140	100	150	9.1	14	15	70	73	73	0.26	0.14	0.23	<0.051	<0.05	0.10	<0.053	<0.051	<0.053
B(a)P Equivalent Concentration	0.063*	0.4158	0.616	0.904	0.0414	0.0075	0.036	0.01	0	0	0.0068	0.0029	0.017	0	0	0	0	0	0
Total PAHs		200.323	165.938	269.594	21.8721	30.93	30.186	137.573	140.009	141.3	0.78	0.38	0.69	-	-	0.10	-	-	-
Other SVOCs																			
bis(2-Ethylhexyl)phthalate	6	<3	1.1	<5.4	<0.6	<0.93	1.9	<2.4	<0.93	<4.1	<0.59	<0.99	<0.52	<0.6	<0.93	<0.56	0.76	<0.95	<1.1
Carbazole	1.8	<3	1.0	<5.4	0.87	0.99	<1	3.9	4.1	5.3	<0.59	<0.99	<0.52	<0.6	<0.93	<0.56	<0.63	<0.95	<0.53
Methylphenol (4-)	49	7.7	5.3		1.0	1.6		<8.2	<2		<2	<2.1		<2	<2		<2.1	<2	
Total Other SVOCs		31.9	16.9	-	5.4	15.59	1.9	3.9	5.9	5.3	-	-	-	-	-	-	0.76	-	-
Total SVOCs		232.223	182.838	269.594	27.3021	46.52	32.086	141.473	145.909	146.6	0.78	0.38	0.69	-	-	0.10	0.76	-	-
Metals																			
Antimony	6	14.0	14.0	20.0	<50	35.0	42.0	<11.1	1.9	1.6	<11.1	1.6	1.8	<11.1	<1.1	<1	<11.1	<1.1	<1
Arsenic	10	539	520	800	436	520	790	15.5	18.0	<0.046	72.0	61.0	76.0	0.52	<0.56	0.25	0.46	<0.81	1.7
Chromium	100	11.3	9.4	10.0	33.6	39.0	76.0	21.7	7.2	14.0	34.1	2.0	2.0	4.4	1.6	<1	<1.1	<1.1	<1
Lead	15	10.5	17.0	6.8	12.0	4.0	6.3	13.7	3.2	9.8	<1.1	0.57	1.4	1.6	<0.6	1.1	<1.1	<0.21	<1
Manganese	300	205	<180	140	595	580	1,700	961	380	1,700	31.5	20.0	51.0	983	390	120	<11.1	<12	<10
Nickel	210	261	<200	230	164	<110	150	22.7	<5.8	16.0	6.6	3.7	<10	4.2	<2.4	<10	<1.1	<1.2	<10
Vanadium	45	2,860	1,700	2,800	2,290	2,400	3,400	44.6	46.0	100	255	190	260	<11.1	<1.1	<1	<11.1	2.5	5.9
Zinc	3100	<12.9	<50	<50	<165	<50	58.0	<54.5	<13	33.0	<11.1	<11	<10	<22.4	<11	10.0	<29.2	<11	<10

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	D SH-14D 10/2/2006	D SH-15D 9/10/2001	D SH-15D 5/17/2002	D SH-15D 11/4/2003	D SH-15D 9/27/2006	D SH-17D 11/20/2003	D SH-17D 10/5/2006	D SH-18D 9/4/2001	D SH-18D 5/15/2002	D SH-18D 9/26/2006	D SH-19D 9/5/2001	D SH-19D 5/16/2002	D SH-19D 9/25/2006	D SH-25D 11/5/2003	D SH-25D 9/27/2006	D SH-27D 11/19/2003	D SH-27D 10/2/2006	D SH-28D 11/6/2003
AVOCs																			
Benzene	5	<0.2	<0.25	<0.22	<0.15	<0.2	2.9	3.4	<0.25	<0.22	<0.2	<0.25	<0.22	<0.2	<0.15	<0.2	<0.15	<0.2	<0.15
Ethylbenzene	700	<2	<2	<2	<2	<2	<2	1.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total AVOCs		-	-	-	-	-	9.8	13.2	-	-	-	-	-	-	-	-	-	-	-
CVOCs																			
Methylene chloride	5	<2	<0.2	<0.21	<0.25	<2	<0.25	<2	<0.2	<0.21	<2	<0.2	<0.21	<2	<0.25	<2	<0.25	<2	<0.25
Trichloroethene	5	<0.2	<0.26	<0.26	<0.18	<0.2	<0.18	<2	<0.26	<0.26	<0.2	<0.26	<0.26	<0.2	1.8	1.1	2.3	1.5	<0.18
Total CVOCs		-	-	-	-	-	-	-	-	-	0.32	-	-	0.26	1.8	1.1	4.1	2.11	-
Total VOCs		-	-	-	-	-	9.8	13.2	-	-	0.32	-	-	0.26	1.8	1.1	4.1	2.11	-
PAHs																			
Benzo(a)anthracene	0.1	<0.01	<0.053	<0.053	<0.052	0.0020	<0.051	0.0057	<0.051	<0.052	<0.011	<0.051	<0.054	<0.011	<0.052	<0.01	<0.05	<0.011	<0.054
Benzo(a)pyrene	0.2	<0.01	0.0042	<0.0018	<0.003	<0.01	0.0057	<0.01	<0.0028	<0.0045	<0.011	<0.0029	<0.0024	<0.011	<0.0031	<0.01	0.0096	<0.011	<0.0032
Benzo(b)fluoranthene	0.1	<0.01	<0.053	<0.053	<0.052	<0.01	<0.051	<0.01	<0.051	<0.052	<0.011	<0.051	<0.054	<0.011	<0.052	<0.01	<0.05	<0.011	<0.054
Dibenz(a,h)anthracene	0.1	<0.01	0.0053	0.0037	<0.0022	<0.01	<0.0022	<0.01	<0.0043	<0.0026	<0.011	<0.0044	<0.0027	<0.011	<0.0022	<0.01	0.0081	0.0021	<0.0023
Indeno(1,2,3-cd)pyrene	0.1	<0.01	<0.053	<0.053	<0.052	<0.01	<0.051	<0.01	<0.051	<0.052	<0.011	<0.051	<0.054	<0.011	<0.052	<0.01	<0.05	<0.011	<0.054
Methylnaphthalene (2-)	10	<0.01	<0.053	<0.053	<0.052	<0.01	3.8	2.7	<0.051	<0.052	<0.011	<0.051	<0.054	<0.011	<0.052	<0.01	<0.05	<0.011	<0.054
Naphthalene	15	<0.01	<0.053	<0.053	<0.052	<0.01	3.2	3.6	<0.051	<0.052	<0.011	<0.051	<0.054	<0.011	<0.052	<0.01	<0.05	<0.011	<0.054
B(a)P Equivalent Concentration	0.063*	0	0.0095	0.0037	0	0.0002	0.0057	0.00057	0	0	0	0	0	0	0	0	0.0177	0.0021	0
Total PAHs		-	0.0095	0.0037	-	0.0125	7.7	7.0627	-	-	0.0023	-	-	-	-	0.0102	0.018	0.0021	-
Other SVOCs																			
bis(2-Ethylhexyl)phthalate	6	<1	3.8	<0.99	<0.52	<1	<1.1	<1	<0.8	<0.96	<1.1	<3.4	<1	<1.1	<2.5	<1	<0.59	<1.1	<0.27
Carbazole	1.8	<0.01	<0.62	<0.99	<0.52	<0.01	0.68	0.74	<0.6	<0.96	<0.011	<0.6	<1	<0.011	<0.26	<0.01	<0.25	<0.011	<0.27
Methylphenol (4-)	49		<2.1	<2.1			0.15		<2	<2.1		<2	<2.2		<0.26		<0.25		<0.27
Total Other SVOCs		-	3.8	-	-	-	1.5	0.74	-	-	-	-	-	-	-	-	-	-	0.42
Total SVOCs		-	3.8	0.0037	-	0.0125	9.1	7.8027	-	-	0.0023	-	-	-	-	0.0102	0.018	0.0021	0.42
Metals																			
Antimony	6	<0.5	<11.1	<1.1	<1	<0.5	3.6	2.1	<11.1	<1.1	<0.5	<11.1	<1.1	<0.5	<1	<0.5	2.2	<0.5	<1
Arsenic	10	0.99	0.50	<0.29	0.18	0.60	69.0	52.0	0.53	0.78	1.0	0.68	0.80	0.97	0.14	0.31	1.6	1.7	0.40
Chromium	100	0.55	4.7	1.2	<1	1.6	1.1	<2.5	<1.1	<1.1	0.62	1.8	1.2	0.69	<1	0.71	<1	0.71	1.4
Lead	15	<0.5	<1.1	<0.55	<1	1.2	5.2	2.0	<1.1	<0.11	0.64	<1.1	<0.24	<0.5	<1	<0.5	<1	<0.5	<1
Manganese	300	<5	76.8	<110	83.0	52.0	61.0	30.0	130	24.0	<5	485	190	46.0	76.0	34.0	170	120	95.0
Nickel	210	0.93	2.3	<2.2	<10	2.5	14.0	6.2	1.4	1.4	<2	3.5	2.3	<2	<10	<2	<10	2.6	<10
Vanadium	45	2.3	<11.1	1.5	<1	2.1	220	220	<11.1	<1.1	1.9	<11.1	<1.1	2.3	<1	<1	4.6	3.5	1.9
Zinc	3100	<5	<84.8	<11	<10	<11	<10	<5.9	<81.5	<11	<5	<90	<11	<6.5	<10	<6.8	<10	72.0	<10

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	D	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
		SH-28D	SH-01R	SH-01R	SH-01R	SH-01R	SH-02R	SH-02R	SH-02R	SH-02R	SH-05R-A	SH-05R-A	SH-05R-B	SH-05R-B	SH-06R-A	SH-06R-A	SH-06R-B	SH-06R-B	SH-17R
		9/27/2006	9/13/2001	5/22/2002	10/30/2003	10/4/2006	9/12/2001	5/16/2002	11/4/2003	9/29/2006	11/10/2003	10/3/2006	11/11/2003	10/4/2006	11/5/2003	10/2/2006	11/6/2003	10/2/2006	11/20/2003
AVOCs																			
Benzene	5	<2	660	690	390	270	8.4	6.9	2.1	<2	<0.15	<2	<0.15	<2	<0.15	<0.2	<0.15	<0.2	2.0
Ethylbenzene	700	<2	280	380	260	160	2.7	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total AVOCs		-	2,680	3,210	2,290	1,540	28.1	11	2.1	-	-	-	-	-	-	-	-	-	4.4
CVOCs																			
Methylene chloride	5	<2	14	<20	<78	<40	<0.2	<0.21	<0.25	<2	<0.25	<2	<0.25	<2	<0.25	<2	<0.25	<2	<0.25
Trichloroethene	5	<2	<13	<13	<9	<40	1.0	0.99	0.81	<2	<0.18	<2	<0.18	<2	1.9	1.2	1.5	0.44	<0.18
Total CVOCs		-	14	-	-	ND	1.0	0.99	0.81	-	-	-	-	-	1.9	1.2	1.5	0.44	-
Total VOCs		-	3,024	3,500	2,389	1,609	29.1	11.99	2.9	-	-	-	-	-	1.9	1.2	1.5	0.44	4.4
PAHs																			
Benzo(a)anthracene	0.1	<0.01	<5.2	<2.6	<21	0.84	<0.051	<0.053	<0.057	<0.01	<0.05	<0.011	<0.054	<0.011	<0.053	<0.011	<0.053	<0.01	<0.053
Benzo(a)pyrene	0.2	<0.01	2.7	0.91	<1.2	0.41	<0.0029	<0.0018	<0.0034	<0.01	<0.003	<0.011	<0.0032	<0.011	<0.012	<0.011	<0.0031	<0.01	0.0037
Benzo(b)fluoranthene	0.1	<0.01	<5.2	<2.6	<21	0.19	<0.051	<0.053	<0.057	<0.01	<0.05	<0.011	<0.054	<0.011	<0.053	<0.011	<0.053	<0.01	<0.053
Dibenz(a,h)anthracene	0.1	0.0025	0.85	<0.13	<0.9	0.021	<0.0044	<0.0027	<0.0024	0.0014	<0.0021	0.0018	<0.0023	0.0032	<0.0022	<0.011	<0.0023	0.002	0.0032
Indeno(1,2,3-cd)pyrene	0.1	<0.01	<5.2	<2.6	<21	0.063	<0.051	<0.053	<0.057	<0.01	<0.05	<0.011	<0.054	<0.011	<0.053	<0.011	<0.053	<0.01	<0.053
Methylnaphthalene (2-)	10	<0.01	620	480	410	320	1.4	3.8	0.11	<0.01	<0.05	<0.011	<0.054	<0.011	<0.053	<0.011	<0.053	<0.01	1.5
Naphthalene	15	<0.01	3,200	3,300	2,900	2,300	8.3	83	15	0.024	<0.05	<0.011	<0.054	<0.011	<0.053	<0.011	<0.053	<0.01	1.5
B(a)P Equivalent Concentration	0.063*	0.0025	3.55	0.91	0	0.5403	0	0	0	0.0014	0	0.0018	0	0.0032	0	0	0	0.002	0.0069
Total PAHs		0.0039	4,276.55	4,072.51	3,498	2,796.51	9.9	87.55	15.72	0.818	-	0.0018	-	0.0032	0.061	-	-	0.0020	3.2
Other SVOCs																			
bis(2-Ethylhexyl)phthalate	6	<1	<61	<20	<210	6.4	<0.6	<0.99	<0.57	<1	<0.43	<1.1	<0.59	<1.1	<0.37	<1.7	<1.2	<1	<0.66
Carbazole	1.8	0.0014	<61	22	<210	10	<0.6	<0.99	<0.57	0.018	<0.25	<0.011	<0.27	<0.011	<0.26	<0.011	<0.27	<0.01	0.30
Methylphenol (4-)	49		92	R			<2	<2.1			<0.25		<0.27		<0.26		<0.27		0.11
Total Other SVOCs		0.0014	157	22	-	16.4	-	-	-	0.018	-	-	-	-	-	-	-	-	0.53
Total SVOCs		0.0053	4,433.55	4,094.51	3,498	2,813	9.9	87.55	15.72	0.836	-	0.0018	-	0.0032	0.061	-	-	0.0020	3.7
Metals																			
Antimony	6	<0.5	<50	20.0	20.0	<50	<11.1	<1.1	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	1.6
Arsenic	10	<0.46	343	300	450	620	3.8	3.4	2.7	2.2	20.0	24.0	22.0	24.0	1.3	2.0	1.1	1.2	48.0
Chromium	100	0.63	24.0	15.0	16.0	<50	8.0	1.8	<1	<0.5	<1	<0.5	<1	0.6	<1	0.79	<1	0.61	<1
Lead	15	0.57	5.4	17.0	62.0	<50	<1.1	0.86	<1	0.57	<1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	1.9
Manganese	300	29.0	208	280	550	840	262	400	590	280	23.0	12.0	24.0	28.0	120	220	380	35.0	470
Nickel	210	1.3	286	150	160	220	29.0	25.0	36.0	31.0	<10	0.73	<10	0.79	72.0	68.0	95.0	45.0	30.0
Vanadium	45	2.0	1,390	1,100	1,400	2,300	<11.1	1.5	<1	1.6	1.2	<1	<1	<1	1.5	2.2	1.6	1.2	170
Zinc	3100	<5	278	<210	410	<500	<107	<11	<10	<5.1	<10	<7.3	<10	<10	12.0	<5.8	<10	<6.7	<10

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	R	R	R	R	R	R	R	R	R	R	S	S	S	S	S	S	S	S
		SH-17R	SH-19R	SH-19R	SH-19R	SH-24R	SH-24R	SH-27R	SH-27R	SH-28R	SH-28R	SH-01S	SH-01S	SH-01S	SH-01S	SH-02S	SH-02S	SH-02S	SH-03S
		10/4/2006	9/5/2001	5/16/2002	9/28/2006	11/6/2003	9/28/2006	11/20/2003	9/29/2006	11/7/2003	9/29/2006	9/12/2001	5/21/2002	10/28/2003	10/5/2006	9/12/2001	5/24/2002	10/29/2003	9/11/2001
AVOCs																			
Benzene	5	<10	<0.25	<0.22	<2	<0.15	<2	<0.15	<2	<0.15	<2	16	1.3	2.2	2.2	0.96	0.84	<0.75	<0.25
Ethylbenzene	700	<10	<2	<2	<2	<2	<2	<2	<2	<2	<2	7.0	1.7	<10	3.4	<2	<2	<10	<2
Total AVOCs		-	-	-	-	-	-	-	-	-	-	89.3	12.4	29.2	25.3	0.96	0.84	-	8.8
CVOCs																			
Methylene chloride	5	<10	<0.2	<0.21	<2	<0.25	<2	<0.25	<2	<0.25	<2	<0.2	<0.21	<7.8	<2	<0.2	<0.21	<7.8	<0.2
Trichloroethene	5	<10	<0.26	<0.26	<2	<0.18	<2	5.1	3.9	0.43	1.3	<0.26	<0.26	<0.9	<2	<0.26	<0.26	<0.9	<0.26
Total CVOCs		-	-	-	-	-	-	7.6	4.9	0.43	1.3	-	-	-	ND	-	-	-	-
Total VOCs		-	-	-	-	-	-	7.6	4.9	0.43	1.3	92.6	23.7	78.2	25.3	0.96	4.2	-	24.8
PAHs																			
Benzo(a)anthracene	0.1	0.0048	<0.051	<0.054	<0.01	<0.052	<0.011	<0.05	<0.01	<0.054	<0.011	<0.21	<0.1	<0.53	0.16	<0.053	<0.05	<0.05	<0.052
Benzo(a)pyrene	0.2	<0.01	0.0045	<0.0024	<0.01	<0.003	<0.011	<0.003	<0.01	<0.0032	<0.011	<0.054	0.048	0.27	0.062	<0.003	0.0019	0.0062	<0.0029
Benzo(b)fluoranthene	0.1	<0.01	<0.051	<0.054	<0.01	<0.052	<0.011	<0.05	<0.01	<0.054	<0.011	<0.21	<0.1	<0.53	0.040	<0.053	<0.05	<0.05	<0.052
Dibenz(a,h)anthracene	0.1	<0.01	<0.0043	<0.0027	<0.01	<0.0022	0.0012	<0.0021	<0.01	<0.0023	<0.011	0.029	0.0081	<0.022	<0.01	<0.0045	<0.0025	<0.0021	<0.0045
Indeno(1,2,3-cd)pyrene	0.1	<0.01	<0.051	<0.054	<0.01	<0.052	<0.011	<0.05	<0.01	<0.054	<0.011	<0.21	<0.1	<0.53	0.018	<0.053	<0.05	<0.05	<0.052
Methylnaphthalene (2-)	10	2.4	<0.051	<0.054	<0.01	<0.052	<0.011	0.060	<0.01	<0.054	<0.011	25	19	58	46	1.7	<0.05	<0.05	<0.052
Naphthalene	15	2.7	<0.051	<0.054	<0.01	<0.052	<0.011	0.053	<0.01	<0.054	<0.011	110	46	150	100	5.2	0.085	0.055	0.13
B(a)P Equivalent Concentration	0.063*	0.00048	0.0045	0	0	0	0.0012	0	0	0	0	0.029	0.0561	0.27	0.0838	0	0.0019	0.0062	0
Total PAHs		5.6062	0.0045	-	-	-	0.0028	0.11	-	-	-	152.239	87.0161	289.27	202.201	9.8	0.27	0.67	0.40
Other SVOCs																			
bis(2-Ethylhexyl)phthalate	6	<1	<0.6	<1	<1	<1.9	<1.1	<0.8	<1	<0.27	<1.1	<3.1	<1.8	<5.3	<1	<0.62	<1.9	<0.5	<3.1
Carbazole	1.8	0.41	<0.6	<1	0.0010	<0.26	<0.011	<0.25	<0.01	<0.27	<0.011	<3.1	<0.93	<5.3	2.8	<0.62	<0.93	<0.5	<3.1
Methylphenol (4-)	49		<2	<2.2		<0.26		<0.25		<0.27		<11	<2			<2.1	<2		94
Total Other SVOCs		0.41	-	-	0.0010	-	-	0.82	-	-	-	-	-	-	2.8	-	-	-	157.8
Total SVOCs		6.0162	0.0045	-	0.0010	-	0.0028	0.93	-	-	-	152.239	87.0161	289.27	205.001	9.8	0.27	0.67	158.197
Metals																			
Antimony	6	2.0	<11.1	<1.1	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	<11.1	7.6	12.0	5.6	<11.1	<1.1	<1	<11.1
Arsenic	10	63.0	13.5	12	13.0	0.63	0.75	0.40	<0.4	0.92	1.1	5.9	6.7	15.0	8.0	0.45	1.3	0.85	10.0
Chromium	100	<2.5	1.3	<1.1	0.56	<1	<0.5	<1	0.56	<1	0.59	20.4	3.3	8.7	4.8	28.4	1.4	1.7	3.8
Lead	15	1.2	1.3	<0.3	<0.5	<1	<0.5	<1	<0.5	<1	<0.5	109	110	360	70.0	<1.1	2.4	1.9	<1.1
Manganese	300	93.0	<30.6	<12	15.0	13.0	<5	420	230	19.0	5.8	35.9	22.0	140	82.0	1,320	1,300	1,700	4,180
Nickel	210	14.0	1.3	0.70	0.72	<10	<0.5	<10	4.9	<10	1.5	11.3	16.0	16.0	5.9	4.8	24.0	<10	5.6
Vanadium	45	240	<11.1	<1.1	<1	1.5	<1	1.2	<1	1.2	<1	<11.1	2.9	22.0	7.9	<11.1	<1.1	2.3	<11.1
Zinc	3100	<5	<64.2	<41	<15	<10	<5	<10	<5	<10	<5	<116	86.0	160	<40	<11.1	69.0	<10	<50.1

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
		SH-03S	SH-03S	SH-03S	SH-04S	SH-04S	SH-04S	SH-04S	SH-05S	SH-05S	SH-05S	SH-05S	SH-06S	SH-06S	SH-06S	SH-07S	SH-07S	SH-07S	SH-08S
		5/16/2002	11/3/2003	9/29/2006	9/11/2001	5/20/2002	10/28/2003	10/4/2006	9/11/2001	5/21/2002	10/29/2003	10/4/2006	9/6/2001	5/22/2002	10/29/2003	9/7/2001	5/22/2002	10/29/2003	9/6/2001
AVOCs																			
Benzene	5	<0.22	<0.15	<2	43	17	17	12	7.4	12	2	<10	3.8	4.6	2.6	3.6	0.43	3.2	<0.25
Ethylbenzene	700	<2	<2	<2	23	<20	9.2	5.0	5.0	<10	<10	<10	<10	<10	<10	13	<2	11	<2
Total AVOCs		28	4.6	-	186	50	75.4	28	37.6	38	2	-	15.6	9.9	21.9	49.6	1.8	43.7	-
CVOCs																			
Methylene chloride	5	<0.21	<0.25	<2	<1.4	<6.6	<7.8	<10	<1.4	<1	<7.8	<10	<1.2	<1	<7.8	<1	<0.21	<7.8	<0.3
Trichloroethene	5	<0.26	<0.18	<2	<1.3	<2.6	<0.9	<10	<1.3	<1.3	<0.9	<10	<1.3	<1.3	<0.9	<1.3	<0.26	<0.9	<0.26
Total CVOCs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total VOCs		39.8	4.6	-	204	50	83.4	28	37.6	63	2.0	-	15.6	30.3	21.9	49.6	1.8	43.7	-
PAHs																			
Benzo(a)anthracene	0.1	<0.051	<0.052	<0.01	0.75	0.40	<1	0.052	0.43	0.51	<0.52	0.32	0.18	0.14	<0.23	<0.05	<0.054	<0.1	<0.051
Benzo(a)pyrene	0.2	<0.0017	<0.003	<0.01	0.49	0.24	0.18	0.036	0.29	0.26	0.081	0.16	0.19	0.12	0.1	0.0056	<0.0039	<0.0061	0.0033
Benzo(b)fluoranthene	0.1	<0.051	<0.052	<0.01	<0.51	<0.26	<1	0.017	<0.21	0.11	<0.52	0.09	0.14	0.084	<0.23	<0.05	<0.054	<0.1	<0.051
Dibenz(a,h)anthracene	0.1	<0.0026	<0.0022	0.0046	0.11	0.021	<0.044	<0.01	0.051	0.026	<0.022	0.018	0.029	0.023	<0.0098	<0.0043	<0.0027	<0.0044	<0.0043
Indeno(1,2,3-cd)pyrene	0.1	<0.051	<0.052	<0.01	<0.51	<0.26	<1	0.015	<0.21	<0.1	<0.52	0.036	0.087	0.057	<0.23	<0.05	<0.054	<0.1	<0.051
Methylnaphthalene (2-)	10	<0.051	0.069	<0.01	96	35	59	16	33	20	12	19	7.2	8.3	8.1	23	2.7	12	0.11
Naphthalene	15	<0.051	0.40	<0.01	310	140	200	71	72	52	27	42	34	28	36	22	5.7	16	0.094
B(a)P Equivalent Concentration	0.063*	0	0	0.0046	0.675	0.301	0.18	0.0444	0.384	0.348	0.081	0.2226	0.2597	0.1711	0.1	0.0056	0	0	0.0033
Total PAHs		0.31	1.06	0.2306	484.9	201.871	307.58	106.803	160.371	119.526	66.781	100.581	49.136	42.752	53.21	47.3826	8.8	29.38	0.85
Other SVOCs																			
bis(2-Ethylhexyl)phthalate	6	<0.95	<0.59	<1	<6	<0.96	<10	<1	<2.5	<0.97	<5.2	<1	12	<0.96	<2.3	0.99	<1	<1	<0.61
Carbazole	1.8	<0.95	<0.52	<0.01	<6	1.4	<10	0.84	<2.5	1.1	<5.2	0.74	0.68	<0.96	<2.3	2.3	<1	3.0	<0.6
Methylphenol (4-)	49	21			8.5	5.2			<8.4	1.3			1.1	<2.1		<2	<2.2		<2
Total Other SVOCs		26.3	-	-	17.7	16	-	0.84	-	4.6	-	0.74	14.78	1.1	-	6.3	-	3.0	-
Total SVOCs		26.61	1.06	0.23	502.6	217.871	307.58	107.643	160.371	124.126	66.781	101.321	63.916	43.852	53.21	53.6726	8.8	32.38	0.85
Metals																			
Antimony	6	<1.1	<1	<0.5	<11.1	1.1	1.2	0.74	<11.1	2.8	<1	2.2	<11.1	5.3	4.8	<11.1	5.5	4.1	<11.1
Arsenic	10	3.3	7.8	10.0	61.4	38.0	35.0	17.0	27.3	21.0	6.4	11.0	14.2	<8.4	7.7	2.3	<2.6	2.5	7.4
Chromium	100	3.4	2.3	2.3	9.6	3.4	3.1	5	5.9	5.2	2.5	5.4	25.9	10.0	7.0	9.0	5.5	4.4	1.3
Lead	15	1.2	3.0	0.62	6.2	<2.2	6.5	8	25.7	23.0	12.0	26.0	575	190	140	67.9	22.0	48.0	<1.1
Manganese	300	4,000	2,600	3,300	57.6	69.0	79.0	73.0	90.7	93.0	170	150	241	320	120	121	<130	140	1,150
Nickel	210	4.4	<10	5.0	47.8	24.0	24.0	10.0	21.2	15.0	<10	8.3	29.6	<16	15	7.2	<6.7	<10	1.4
Vanadium	45	2.1	1.8	1.1	140	78.0	84.0	36.0	96.7	58.0	15.0	25.0	68.5	28.0	30.0	14.1	7.3	11.0	<11.1
Zinc	3100	13.0	<10	140	<19.5	<11	<10	<6.9	<11.8	<11	20.0	<9.6	<182	<79	42.0	<52.9	<47	42.0	<11.1

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
		SH-08S	SH-08S	SH-09S	SH-09S	SH-09S	SH-10S	SH-10S	SH-10S	SH-11S	SH-11S	SH-11S	SH-12S	SH-12S	SH-12S	SH-13S	SH-13S	SH-13S	SH-13S
		5/21/2002	10/28/2003	9/7/2001	5/17/2002	10/31/2003	9/10/2001	5/23/2002	10/31/2003	9/7/2001	5/16/2002	11/3/2003	9/11/2001	5/17/2002	11/3/2003	9/11/2001	5/16/2002	11/3/2003	9/28/2006
AVOCs																			
Benzene	5	<0.22	<0.15	<0.25	<0.22	<0.15	<0.25	<0.22	<0.15	<0.25	<0.22	<0.15	<0.25	0.39	0.53	<0.25	<0.22	<0.15	<2
Ethylbenzene	700	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total AVOCs		-	-	-	-	-	-	-	-	-	-	-	-	0.39	0.53	-	-	-	-
CVOCs																			
Methylene chloride	5	<0.21	<1.6	<0.2	<0.21	<1.6	<0.2	<0.21	<1.6	<0.2	<0.21	<0.25	<0.2	<0.21	<0.25	<0.2	<0.21	<0.25	<2
Trichloroethene	5	<0.26	<0.18	<0.26	<0.26	<0.18	<0.26	<0.26	<0.18	<0.26	<0.26	<0.18	<0.26	<0.26	<0.18	<0.26	<0.26	<0.18	<2
Total CVOCs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total VOCs		-	-	40	31	-	-	3.5	-	-	-	-	-	4.9	0.53	-	-	-	-
PAHs																			
Benzo(a)anthracene	0.1	<0.05	<0.055	<0.051	<0.052	<0.051	<0.052	<0.054	<0.053	<0.051	<0.05	<0.051	<0.052	<0.05	<0.051	<0.051	<0.05	<0.052	<0.011
Benzo(a)pyrene	0.2	<0.0017	<0.0032	<0.0029	<0.0018	<0.003	0.0032	<0.0018	<0.0031	<0.0028	<0.0017	<0.003	<0.0029	<0.0046	<0.003	<0.0029	<0.0027	0.11	<0.011
Benzo(b)fluoranthene	0.1	<0.05	<0.055	<0.051	<0.052	<0.051	<0.052	<0.054	<0.053	<0.051	<0.05	<0.051	<0.052	<0.05	<0.051	<0.051	<0.05	0.14	<0.011
Dibenz(a,h)anthracene	0.1	<0.0025	<0.0024	<0.0044	<0.0026	<0.0022	<0.0045	<0.0027	<0.0022	<0.0043	<0.0025	<0.0022	<0.0045	0.003	<0.0022	<0.0044	<0.0025	0.033	0.0029
Indeno(1,2,3-cd)pyrene	0.1	<0.05	<0.055	<0.051	<0.052	<0.051	<0.052	<0.054	<0.053	<0.051	<0.05	<0.051	<0.052	<0.05	<0.051	<0.051	<0.05	0.17	<0.011
Methylnaphthalene (2-)	10	<0.05	<0.055	<0.051	<0.052	<0.051	<0.052	<0.054	<0.053	<0.051	<0.05	<0.051	<0.052	<0.05	<0.051	<0.051	<0.05	<0.052	<0.011
Naphthalene	15	<0.05	<0.055	<0.051	<0.052	0.073	<0.052	<0.054	0.29	<0.051	<0.05	<0.051	<0.052	<0.05	<0.051	<0.051	<0.05	<0.052	<0.011
B(a)P Equivalent Concentration	0.063*	0	0	0	0	0	0.0032	0	0	0	0	0	0	0.003	0	0	0	0.174	0.0029
Total PAHs		-	-	0.10	0.060	0.16	0.0032	-	0.29	-	-	-	-	0.003	-	-	-	1.04	0.0046
Other SVOCs																			
bis(2-Ethylhexyl)phthalate	6	<0.93	<0.55	<0.6	<0.97	<0.51	<0.61	<1	<0.83	0.68	<0.93	<0.51	<0.61	<0.93	<2.4	<0.6	<0.93	<0.52	<1.1
Carbazole	1.8	<0.93	<0.55	<0.6	<0.97	<0.51	<0.61	<1	<0.53	<0.6	<0.93	<0.51	<0.61	<0.93	<0.51	<0.6	<0.93	<0.52	0.0022
Methylphenol (4-)	49	<2		<2	<2.1		<2.1	<2.2		<2	<2		<2.1	<2		<2	<2		
Total Other SVOCs		-	-	-	-	-	-	-	-	0.68	-	-	-	-	-	-	-	-	0.0022
Total SVOCs		-	-	0.1	0.06	0.16	0.0032	-	0.29	0.68	-	-	-	0.003	-	-	-	1.04	0.0068
Metals																			
Antimony	6	<1.1	<1	<11.1	<1.1	<1	<11.1	<1.1	<1	<11.1	3.2	4.5	<11.1	<1.1	<1	<11.1	<1.1	<1	<0.5
Arsenic	10	0.79	4.5	54.3	23.0	41.0	0.95	<2	1.5	3.2	<0.66	0.37	5.5	5.4	11.0	3.3	<2.6	5.6	11.0
Chromium	100	5.5	<1	3.0	1.9	<1	2.1	<1.1	<1	<1.1	3.5	<1	5.0	2.0	<1	35.4	2.2	2.6	0.64
Lead	15	<0.24	<1	2.8	1.4	<1	1.6	<1.4	3.9	<1.1	<1.7	1.7	2.1	9.9	4.6	8.4	15.0	160	53.0
Manganese	300	280	680	44.4	190	34.0	542	1,200	130	2,400	<6.6	<10	2,620	2,600	2,800	1,520	1,800	1,500	820
Nickel	210	4.0	<10	2.0	2.3	<10	2.8	<3.2	<10	1.9	<29	34.0	5.7	<6.1	<10	4.1	<2.7	<10	12.0
Vanadium	45	<1.1	<1	57.0	30.0	48.0	<11.1	<1.1	1.2	<11.1	<1.1	<1	<11.1	<1.1	<1	<11.1	1.4	4.3	3.4
Zinc	3100	<11	<10	<62.5	44.0	<10	<101	<250	68.0	<29.5	6,800	7,700	1,050	1,100	1,800	<285	<82	890	5,300

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
		SH-14S	SH-14S	SH-14S	SH-14S	SH-15S	SH-15S	SH-15S	SH-15S	SH-16S	SH-16S	SH-16S	SH-17S	SH-17S	SH-17S	SH-17S	SH-18S	SH-18S	SH-18S
		9/10/2001	5/20/2002	11/4/2003	10/2/2006	9/10/2001	5/20/2002	10/28/2003	10/3/2006	9/11/2001	5/17/2002	11/19/2003	9/6/2001	5/20/2002	11/19/2003	9/25/2006	9/4/2001	5/15/2002	9/26/2006
AVOCs																			
Benzene	5	<0.25	1.5	<0.15	0.61	7.6	1.7	4.4	<10	<0.25	<0.22	<0.15	<0.25	<0.22	<0.15	<0.2	<0.25	<0.22	<0.2
Ethylbenzene	700	<2	<2	<2	<2	<10	<10	<10	<10	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total AVOCs		-	3.2	-	0.61	20.8	1.7	4.4	-	-	-	-	-	-	-	-	-	-	-
CVOCs																			
Methylene chloride	5	<0.2	<0.21	<0.25	<2	<1	<1	<7.8	<10	<0.2	<0.21	<0.25	<0.28	<0.21	<0.25	<2	<0.2	<0.21	<2
Trichloroethene	5	<0.26	<0.26	<0.18	<0.2	<1.3	<1.3	<0.9	<10	<0.26	<0.26	<0.18	<0.26	<0.26	<0.18	<0.2	<0.26	<0.26	<0.2
Total CVOCs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total VOCs		-	3.2	-	0.61	20.8	1.7	4.4	-	-	-	-	-	-	-	-	-	-	-
PAHs																			
Benzo(a)anthracene	0.1	<0.051	<0.05	<0.057	0.017	0.071	0.067	<0.21	0.026	<0.051	<0.052	<0.053	<0.05	<0.05	<0.052	<0.01	<0.052	<0.052	<0.01
Benzo(a)pyrene	0.2	0.0036	0.021	<0.01	0.011	0.043	0.034	0.048	0.013	<0.0029	<0.0018	<0.0031	0.021	0.002	<0.003	<0.01	<0.0029	<0.0019	<0.01
Benzo(b)fluoranthene	0.1	<0.051	<0.05	<0.057	<0.01	<0.05	<0.056	<0.21	0.0059	<0.051	<0.052	<0.053	<0.05	<0.05	<0.052	<0.01	<0.052	<0.052	<0.01
Dibenz(a,h)anthracene	0.1	<0.0044	0.0071	<0.0024	0.0015	0.0061	0.0033	<0.0091	<0.01	<0.0044	<0.0026	<0.0022	<0.0043	<0.0025	0.0024	<0.01	<0.0044	0.0076	<0.01
Indeno(1,2,3-cd)pyrene	0.1	<0.051	<0.05	<0.057	<0.01	<0.05	<0.056	<0.21	<0.01	<0.051	<0.052	<0.053	<0.05	<0.05	<0.052	<0.01	<0.052	<0.052	<0.01
Methylnaphthalene (2-)	10	0.43	3.3	<0.057	<0.01	21	3.3	17	2.7	<0.051	<0.052	<0.053	<0.05	<0.05	<0.052	<0.01	<0.052	<0.052	<0.01
Naphthalene	15	0.72	14	0.86	0.84	59	10	55	8.3	<0.051	<0.052	<0.053	<0.05	<0.05	<0.052	<0.01	<0.052	<0.052	<0.01
B(a)P Equivalent Concentration	0.063*	0.0036	0.0281	0	0.0142	0.0562	0.044	0.048	0.01619	0	0	0	0.021	0.002	0.0024	0	0	0.0076	0
Total PAHs		1.8	18.7891	1.0	1.0061	98.1851	16.9213	90.538	15.6371	-	-	-	0.25	0.0020	0.0024	0.277	-	0.0076	0.0067
Other SVOCs																			
bis(2-Ethylhexyl)phthalate	6	<0.6	0.94	110	<1	<0.59	<1	<2.1	<1	<0.6	<0.97	<0.53	<0.86	<0.93	<0.52	6.9	<1.3	<0.96	<1
Carbazole	1.8	<0.6	<0.93	<0.57	0.0086	0.70	<1	<2.1	0.16	<0.6	<0.97	<0.53	<0.59	<0.93	<0.52	<0.01	<0.61	<0.96	<0.01
Methylphenol (4-)	49	<2	<2			<2	<2.2			<2	<2.1		<2	<2			<2.1	<2.1	
Total Other SVOCs		-	0.94	110	0.0086	3.8	-	-	0.16	-	-	-	-	-	-	6.9	-	-	-
Total SVOCs		1.8	19.7291	111	1.0147	101.9751	16.9213	90.538	15.7971	-	-	-	0.25	0.0020	0.0024	7.177	-	0.0076	0.0067
Metals																			
Antimony	6	<11.1	<1.1	<1	<0.5	<11.1	<1.1	<1	0.65	<11.1	<1.1	<1	<11.1	<1.1	<1	<0.5	<11.1	<1.1	<0.5
Arsenic	10	1.4	4.9	4.6	2.1	16.5	19.0	13.0	12.0	17.4	4.7	4.0	0.31	<0.32	0.14	0.24	0.37	0.67	0.74
Chromium	100	1.8	2.0	<1	<0.5	6.1	4.8	2.6	<2.5	4.8	4.3	1.4	<1.1	1.2	<1	<0.5	<1.1	<1.1	<0.5
Lead	15	<1.1	0.36	<1	<0.5	5.1	34.0	3.5	0.92	1.6	<2.1	2.5	<1.1	<0.12	<1	<0.5	<1.1	<0.15	<0.5
Manganese	300	1,670	1,800	2,000	2,300	28.5	36.0	22.0	<25	102	<16	24.0	<29.2	<1.4	11.0	5.6	456	420	95.0
Nickel	210	4.6	7.0	<10	6.0	10.6	9.6	<10	3.0	5.5	<2.7	<10	1.2	1.4	<10	<2	3.0	2.8	<2
Vanadium	45	<11.1	7.2	6.1	3.0	44.7	44.0	26.0	37.0	57.3	16.0	11.0	<11.1	1.3	<1	1.0	<11.1	1.1	2.4
Zinc	3100	<11.1	<11	<10	<5	<11.1	<11	18.0	<5	<91.6	<54	<10	<11.1	<32	<10	<5	<11.1	170	<5

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
		SH-19S	SH-19S	SH-19S	SH-20S	SH-20S	SH-21S	SH-21S	SH-21S	SH-22S	SH-22S	SH-22S	SH-23S	SH-23S	SH-23S	SH-23S	SH-24S	SH-24S	SH-25S
		9/5/2001	5/21/2002	9/29/2006	9/5/2001	5/17/2002	9/6/2001	5/16/2002	9/26/2006	9/5/2001	5/17/2002	9/25/2006	9/4/2001	5/15/2002	11/4/2003	9/25/2006	11/6/2003	9/28/2006	11/5/2003
AVOCs																			
Benzene	5	<0.25	<0.22	<0.2	<0.25	<0.22	<0.25	<0.22	<0.2	<0.25	<0.22	<0.2	<0.25	<0.22	<0.15	<0.2	<0.15	<0.2	<0.15
Ethylbenzene	700	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total AVOCs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CVOCs																			
Methylene chloride	5	<0.2	<0.21	<2	<0.23	<0.21	<0.2	<0.21	<2	<0.2	<0.21	<2	<0.2	<0.21	<0.25	<2	<0.25	<2	<0.25
Trichloroethene	5	<0.26	<0.26	<0.2	0.31	<0.26	<0.26	<0.26	<0.2	0.43	<0.26	<0.2	<0.26	<0.26	<0.18	<0.2	<0.18	<0.2	0.73
Total CVOCs		-	-	-	0.31	-	-	0.48	0.23	0.43	-	0.40	-	-	-	-	0.12	0.33	0.73
Total VOCs		1.1	2.0	-	0.31	-	-	5.5	0.23	0.43	-	0.40	-	-	-	-	0.12	2.33	0.73
PAHs																			
Benzo(a)anthracene	0.1	<0.05	<0.051	<0.01	<0.053	<0.052	0.30	0.83	1.6	<0.053	<0.052	0.0016	<0.054	<0.052	<0.053	0.002	<0.054	<0.011	<0.053
Benzo(a)pyrene	0.2	<0.0028	<0.0017	<0.01	<0.003	<0.0018	0.25	0.87	1.8	<0.003	<0.0021	<0.01	<0.003	<0.013	<0.0031	<0.011	<0.0098	<0.011	<0.0049
Benzo(b)fluoranthene	0.1	<0.05	<0.051	<0.01	<0.053	<0.052	0.22	0.59	1.4	<0.053	<0.052	<0.01	<0.054	<0.052	<0.053	<0.011	<0.054	<0.011	<0.053
Dibenz(a,h)anthracene	0.1	<0.0043	<0.0026	<0.01	<0.0045	<0.0026	0.032	0.15	0.4	<0.0045	<0.0026	<0.01	<0.0047	0.053	<0.0023	<0.011	<0.0027	<0.011	<0.0024
Indeno(1,2,3-cd)pyrene	0.1	<0.05	<0.051	<0.01	<0.053	<0.052	0.12	0.45	1.1	<0.053	<0.052	<0.01	<0.054	<0.052	<0.053	<0.011	<0.054	<0.011	<0.053
Methylnaphthalene (2-)	10	<0.05	<0.051	<0.01	<0.053	<0.052	0.40	0.17	0.17	<0.053	<0.052	<0.01	<0.054	<0.052	<0.053	<0.011	<0.054	<0.011	<0.053
Naphthalene	15	<0.05	<0.051	<0.013	<0.053	<0.052	1.1	0.47	0.38	<0.053	<0.052	<0.01	<0.054	<0.052	<0.053	<0.011	<0.054	<0.011	<0.053
B(a)P Equivalent Concentration	0.063*	0	0	0	0	0	0.346	1.207	2.61	0	0	0.00016	0	0.053	0	0.0002	0	0	0
Total PAHs		0.57	0.19	0.288	-	0.16	13.022	13.31	21.032	-	-	0.003	-	0.053	-	0.0056	-	-	-
Other SVOCs																			
bis(2-Ethylhexyl)phthalate	6	<0.59	<0.95	<1	<1.1	<0.97	<0.61	<1	<1	<0.62	<0.96	<1	<0.64	<0.99	<0.53	<1.1	<0.85	<1.1	<1.9
Carbazole	1.8	<0.59	<0.95	0.055	<0.62	<0.97	<0.61	<1	0.062	<0.62	<0.96	<0.01	<0.64	<0.97	<0.53	<0.011	<0.27	<0.011	<0.27
Methylphenol (4-)	49	<2	<2		<2.1	<2.1	<2.1	<2.2		<2.1	<2.1		<2.2	<2.1			<0.27		<0.27
Total Other SVOCs		-	-	0.055	-	-	0.76	-	0.062	-	-	-	-	-	-	-	-	-	-
Total SVOCs		0.57	0.19	0.343	-	0.16	13.782	13.31	21.094	-	-	0.003	-	0.053	-	0.0056	-	-	-
Metals																			
Antimony	6	<11.1	<1.1	<0.5	<11.1	<1.1	<11.1	<1.1	<0.5	<11.1	<1.1	<0.5	<11.1	<1.1	<1	<0.5	<1	<0.5	<1
Arsenic	10	3.7	3.9	2.3	5.1	4.1	0.40	1.3	0.97	0.36	<0.57	0.83	0.71	0.73	0.82	0.76	0.20	0.66	0.48
Chromium	100	17.2	1.6	<0.5	<1.1	<1.1	<1.1	1.8	1.0	<1.1	1.1	0.69	1.8	<1.1	1.6	1.0	<1	0.59	3.3
Lead	15	<1.1	<0.14	<0.5	<1.1	<0.14	<1.1	<3	3.8	<1.1	<0.15	<0.5	<1.1	<0.24	<1	<0.5	<1	0.7	1.1
Manganese	300	414	420	220	209	210	<11.1	<12	<5	270	<6.3	<5	102	<15	36.0	11.0	84.0	<5	360
Nickel	210	6.7	17.0	2.4	3.0	1.9	2.1	2.9	<2	2.7	1.1	<2	2.8	1.6	<10	<2	<10	<2	<10
Vanadium	45	<11.1	<1.1	<1	<11.1	<1.1	<11.1	3.5	3.2	<11.1	<1.1	2.3	<11.1	<1.1	2.4	2.3	<1	1.1	4.8
Zinc	3100	<71.3	170	<31	<11.5	<11	<49.7	<31	<5.1	<11.1	<45	<5	<11.1	130	<10	<5.8	<10	<6.7	<10

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	S SH-25S 9/26/2006	S SH-26S 10/28/2003	S SH-26S 10/4/2006	S SH-27S 11/21/2003	S SH-27S 9/25/2006	S SH-28S 11/6/2003	S SH-28S 9/27/2006	S WP-01 11/4/2003	S WP-01 9/27/2006	S WP-02 11/4/2003	S WP-03 11/5/2003	S WP-03 9/27/2006	S WP-04 11/7/2003	S WP-04 9/27/2006	S WP-05 11/7/2003	S WP-05 9/27/2006	S WP-06 10/28/2003	S WP-06 9/27/2006
AVOCs																			
Benzene	5	<0.2	2.5	<2	<0.15	<0.2	<0.15	<0.2	<0.15	<0.2	<0.15	<0.15	<0.2	<0.15	<0.2	<0.15	<0.2	0.19	<2
Ethylbenzene	700	<2	<10	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total AVOCs		-	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.19	-
CVOCs																			
Methylene chloride	5	<2	<7.8	<2	<0.25	<2	<0.25	<2	<0.25	<2	<0.25	<0.25	<2	<0.25	<2	<0.25	<2	<1.6	<2
Trichloroethene	5	0.42	<0.9	<2	<0.18	<0.2	<0.18	<0.2	<0.18	<0.2	<0.18	<0.18	<0.2	<0.18	<0.2	<0.18	<0.2	<0.18	<2
Total CVOCs		0.63	-	-	1.1	2.1	-	0.67	-	-	-	-	-	-	-	-	-	-	-
Total VOCs		0.63	10	-	1.1	2.1	-	0.67	-	-	-	-	-	-	-	-	-	0.19	-
PAHs																			
Benzo(a)anthracene	0.1	0.0014	<0.21	0.024	<0.053	0.0025	<0.054	<0.011	<0.052	0.035	<0.052	<0.054	<0.011	0.093	0.073	<0.053	<0.011	<0.057	0.0046
Benzo(a)pyrene	0.2	<0.01	0.069	0.0075	0.014	<0.011	<0.0032	<0.011	<0.0031	<0.011	<0.003	<0.0032	<0.011	0.088	0.069	<0.0031	<0.011	0.0054	<0.011
Benzo(b)fluoranthene	0.1	<0.01	<0.21	0.0066	<0.053	<0.011	<0.054	<0.011	<0.052	<0.011	<0.052	<0.054	<0.011	0.095	0.061	<0.053	<0.011	<0.057	<0.011
Dibenz(a,h)anthracene	0.1	<0.01	<0.009	<0.01	0.0047	<0.011	<0.0023	<0.011	<0.0022	<0.011	<0.0022	<0.0023	<0.011	0.017	0.017	<0.0023	<0.011	<0.0024	<0.011
Indeno(1,2,3-cd)pyrene	0.1	<0.01	<0.21	<0.01	<0.053	<0.011	<0.054	<0.011	<0.052	<0.011	<0.052	<0.054	<0.011	<0.052	0.044	<0.053	<0.011	<0.057	<0.011
Methylnaphthalene (2-)	10	<0.01	11	<0.087	<0.053	<0.011	<0.054	<0.011	<0.052	<0.011	<0.052	<0.054	<0.011	<0.052	<0.011	<0.053	<0.011	1.2	1.5
Naphthalene	15	<0.01	29	<0.23	<0.053	<0.011	<0.054	<0.011	<0.052	<0.011	<0.052	<0.054	<0.011	<0.052	<0.011	<0.053	<0.011	3.1	5.8
B(a)P Equivalent Concentration	0.063*	0.00014	0.069	0.01056	0.0187	0.00025	0	0	0	0.0035	0	0	0	0.1238	0.1038	0	0	0.0054	0.00046
Total PAHs		0.023	56.939	1.3811	0.019	0.0174	-	-	6.7	1.774	-	-	-	0.97	0.839	-	-	5.6	9.1876
Other SVOCs																			
bis(2-Ethylhexyl)phthalate	6	<1	<3.8	<1	<0.87	<1.2	<0.38	<1.1	<0.61	<1.1	<0.45	<0.4	5.4	<0.76	<1.1	<0.27	<1.1	<0.28	<1.1
Carbazole	1.8	<0.01	0.67	0.015	<0.26	<0.011	<0.27	<0.011	<0.26	<0.011	<0.26	<0.27	<0.011	<0.26	<0.011	<0.27	<0.011	<0.28	0.076
Methylphenol (4-)	49		0.59		<0.26		<0.27		<0.26		<0.26	<0.27		<0.26		<0.27		<0.28	
Total Other SVOCs		-	3.9	0.015	0.37	-	0.17	-	-	-	-	-	5.4	0.59	-	-	-	-	0.076
Total SVOCs		0.023	60.849	1.3961	0.39	0.0174	0.17	-	6.7	1.774	-	-	5.4	1.6	0.839	-	-	5.6	9.2636
Metals																			
Antimony	6	<0.5	1.2	0.7	<1	<0.5	<1	<0.5	1.9	<0.5	<1	<1	<0.5	5.4	0.60	<1	<0.5	<1	<0.5
Arsenic	10	0.76	49.0	31.0	0.55	1.3	0.36	1.0	3.1	2.2	0.92	0.15	0.33	12.0	2.7	0.13	0.30	13.0	14.0
Chromium	100	1.1	30.0	6.8	<1	0.54	<1	<0.5	6.3	0.52	21.0	<1	0.78	130	360	<1	<0.5	1.1	2.7
Lead	15	<0.5	31.0	2.8	1.2	<0.5	<1	<0.5	<1	<0.5	<1	<1	<0.5	230	33.0	<1	<0.5	1.1	2.4
Manganese	300	230	620	120	320	19.0	760	19.0	1,100	680	730	130	46.0	3,900	850	86.0	69.0	23.0	55.0
Nickel	210	3.0	24.0	3.8	<10	<2	<10	<2	<10	<2	15.0	<10	<2	81.0	9.1	<10	<2	<10	2.6
Vanadium	45	4.0	150	80.0	1.3	2.6	<1	1.6	1.7	1.7	1.7	<1	<1	49.0	9.9	<1	<1	42.0	42.0
Zinc	3100	<5.6	63.0	<14	<10	<5	17.0	<14	64.0	<15	<10	<10	<6.7	77.0	<16	<10	<5	<10	<5

TABLE C-3
Summary of Groundwater Data - Comparison to PRGs
Feasibility Study
Blackburn Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Recommended PRG	S WP-07 10/27/2003
AVOCs		
Benzene	5	3.6
Ethylbenzene	700	<10
Total AVOCs		3.6
CVOCs		
Methylene chloride	5	<7.8
Trichloroethene	5	<0.9
Total CVOCs		-
Total VOCs		3.6
PAHs		
Benzo(a)anthracene	0.1	<0.11
Benzo(a)pyrene	0.2	0.077
Benzo(b)fluoranthene	0.1	<0.11
Dibenz(a,h)anthracene	0.1	0.025
Indeno(1,2,3-cd)pyrene	0.1	<0.11
Methylnaphthalene (2-)	10	7.7
Naphthalene	15	18
B(a)P Equivalent Concentration	0.063*	0.102
Total PAHs		34.622
Other SVOCs		
bis(2-Ethylhexyl)phthalate	6	<0.75
Carbazole	1.8	0.64
Methylphenol (4-)	49	0.61
Total Other SVOCs		3.9
Total SVOCs		38.562
Metals		
Antimony	6	1.4
Arsenic	10	59.0
Chromium	100	13.0
Lead	15	170
Manganese	300	81.0
Nickel	210	17.0
Vanadium	45	220
Zinc	3100	18.0

Notes:

1. Samples were collected by Sanborn, Head & Associates, Inc. (SHA) on the dates indicated. See RI Addendum Report (SHA, 2007) for more information (e.g. analytical laboratory methods, data validation, sample bias, etc).

2. Only analytes with Preliminary Remediation Goals (PRGs) are presented on the table.

3. Shaded cells indicate exceedances of the PRGs.

4. "*" indicates that the PRG (0.063 ug/l) for the PAHs benzo(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene is for the benzo(a)pyrene (BaP) equivalent sum of their concentrations and that of benzo(a)pyrene.

TABLE C-4
Summary of Groundwater Data - pH Values Compared to PRGs
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Monitoring Location	Recommended PRG	Collection Date	pH Value (s.u.)
SH-01D	6.5 - 8.5	9/12/2001	14.1
SH-01D	6.5 - 8.5	5/22/2002	14
SH-01D	6.5 - 8.5	10/29/2003	13.5
SH-01D	6.5 - 8.5	10/3/2006	Data Rejected
SH-01R	6.5 - 8.5	9/13/2001	13.2
SH-01R	6.5 - 8.5	5/22/2002	13.9
SH-01R	6.5 - 8.5	10/30/2003	13.4
SH-01R	6.5 - 8.5	10/4/2006	13.1
SH-01S	6.5 - 8.5	9/12/2001	Data Rejected
SH-01S	6.5 - 8.5	5/21/2002	9.4
SH-01S	6.5 - 8.5	10/28/2003	11.2
SH-01S	6.5 - 8.5	10/5/2006	11.1
SH-02D	6.5 - 8.5	9/13/2001	11.9
SH-02D	6.5 - 8.5	5/23/2002	12.6
SH-02D	6.5 - 8.5	10/30/2003	6.6
SH-02R	6.5 - 8.5	9/12/2001	7.2
SH-02R	6.5 - 8.5	5/16/2002	7.3
SH-02R	6.5 - 8.5	11/4/2003	7.4
SH-02R	6.5 - 8.5	9/29/2006	7.5
SH-02S	6.5 - 8.5	9/12/2001	6.7
SH-02S	6.5 - 8.5	5/24/2002	6.7
SH-02S	6.5 - 8.5	10/29/2003	6.8
SH-03D	6.5 - 8.5	9/12/2001	7.2
SH-03D	6.5 - 8.5	5/23/2002	7.0
SH-03D	6.5 - 8.5	11/3/2003	7.1
SH-03D	6.5 - 8.5	10/3/2006	7.0
SH-03S	6.5 - 8.5	9/11/2001	6.3
SH-03S	6.5 - 8.5	5/16/2002	6.5
SH-03S	6.5 - 8.5	11/3/2003	6.3
SH-03S	6.5 - 8.5	9/29/2006	6.8
SH-04D	6.5 - 8.5	9/11/2001	7.1
SH-04D	6.5 - 8.5	5/21/2002	7.1
SH-04D	6.5 - 8.5	11/5/2003	7.2
SH-04S	6.5 - 8.5	9/11/2001	11.9
SH-04S	6.5 - 8.5	5/20/2002	11.4
SH-04S	6.5 - 8.5	10/28/2003	11.3
SH-04S	6.5 - 8.5	10/4/2006	Data Rejected
SH-05D	6.5 - 8.5	9/11/2001	7.2
SH-05D	6.5 - 8.5	5/21/2002	6.9
SH-05D	6.5 - 8.5	11/4/2003	6.9
SH-05D	6.5 - 8.5	10/2/2006	6.8
SH-05R-A	6.5 - 8.5	11/10/2003	8.0
SH-05R-A	6.5 - 8.5	10/3/2006	7.2
SH-05R-B	6.5 - 8.5	11/11/2003	8.5
SH-05R-B	6.5 - 8.5	10/3/2006	7.3
SH-05S	6.5 - 8.5	9/11/2001	12.0
SH-05S	6.5 - 8.5	5/21/2002	11.7
SH-05S	6.5 - 8.5	10/29/2003	9.7
SH-05S	6.5 - 8.5	10/4/2006	10.7

TABLE C-4
Summary of Groundwater Data - pH Values Compared to PRGs
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Monitoring Location	Recommended PRG	Collection Date	pH Value (s.u.)
SH-06D	6.5 - 8.5	9/6/2001	12.5
SH-06D	6.5 - 8.5	5/22/2002	13.1
SH-06D	6.5 - 8.5	10/29/2003	12.8
SH-06R-A	6.5 - 8.5	11/5/2003	6.7
SH-06R-A	6.5 - 8.5	10/2/2006	6.2
SH-06R-B	6.5 - 8.5	11/6/2003	6.8
SH-06R-B	6.5 - 8.5	10/2/2006	6.2
SH-06S	6.5 - 8.5	9/6/2001	9.9
SH-06S	6.5 - 8.5	5/22/2002	10.0
SH-06S	6.5 - 8.5	10/29/2003	9.9
SH-07D	6.5 - 8.5	9/7/2001	13.2
SH-07D	6.5 - 8.5	5/22/2002	13.8
SH-07D	6.5 - 8.5	10/30/2003	13.4
SH-07S	6.5 - 8.5	9/7/2001	9.0
SH-07S	6.5 - 8.5	5/22/2002	7.2
SH-07S	6.5 - 8.5	10/29/2003	8.8
SH-08D	6.5 - 8.5	9/7/2001	10.3
SH-08D	6.5 - 8.5	5/20/2002	10.2
SH-08D	6.5 - 8.5	10/29/2003	10.0
SH-08S	6.5 - 8.5	9/6/2001	6.6
SH-08S	6.5 - 8.5	5/21/2002	6.7
SH-08S	6.5 - 8.5	10/28/2003	6.7
SH-09D	6.5 - 8.5	9/7/2001	11.1
SH-09D	6.5 - 8.5	5/23/2002	11.8
SH-09D	6.5 - 8.5	10/28/2003	11.6
SH-09S	6.5 - 8.5	9/7/2001	7.5
SH-09S	6.5 - 8.5	5/17/2002	6.6
SH-09S	6.5 - 8.5	10/31/2003	7.4
SH-10S	6.5 - 8.5	9/10/2001	6.2
SH-10S	6.5 - 8.5	5/23/2002	6.3
SH-10S	6.5 - 8.5	10/31/2003	5.9
SH-11S	6.5 - 8.5	9/7/2001	6.6
SH-11S	6.5 - 8.5	5/16/2002	6.3
SH-11S	6.5 - 8.5	11/3/2003	6.3
SH-12D	6.5 - 8.5	9/12/2001	6.5
SH-12D	6.5 - 8.5	5/17/2002	6.4
SH-12D	6.5 - 8.5	11/3/2003	6.0
SH-12S	6.5 - 8.5	9/11/2001	6.2
SH-12S	6.5 - 8.5	5/17/2002	6.4
SH-12S	6.5 - 8.5	11/3/2003	6.5
SH-12S	6.5 - 8.5	10/2/2006	5.7
SH-13S	6.5 - 8.5	9/11/2001	6.5
SH-13S	6.5 - 8.5	5/16/2002	6.5
SH-13S	6.5 - 8.5	11/3/2003	6.5
SH-13S	6.5 - 8.5	9/28/2006	5.8

TABLE C-4
Summary of Groundwater Data - pH Values Compared to PRGs
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Monitoring Location	Recommended PRG	Collection Date	pH Value (s.u.)
SH-14D	6.5 - 8.5	9/10/2001	6.2
SH-14D	6.5 - 8.5	5/20/2002	6.4
SH-14D	6.5 - 8.5	11/4/2003	6.7
SH-14D	6.5 - 8.5	10/2/2006	6.2
SH-14S	6.5 - 8.5	9/10/2001	6.4
SH-14S	6.5 - 8.5	5/20/2002	7.0
SH-14S	6.5 - 8.5	11/4/2003	6.6
SH-14S	6.5 - 8.5	10/2/2006	6.4
SH-15D	6.5 - 8.5	9/10/2001	6.0
SH-15D	6.5 - 8.5	5/17/2002	5.9
SH-15D	6.5 - 8.5	11/4/2003	6.1
SH-15D	6.5 - 8.5	9/27/2006	Data Rejected
SH-15S	6.5 - 8.5	9/10/2001	10.3
SH-15S	6.5 - 8.5	5/20/2002	11.9
SH-15S	6.5 - 8.5	10/28/2003	10.1
SH-15S	6.5 - 8.5	10/3/2006	10.4
SH-16S	6.5 - 8.5	9/11/2001	7.6
SH-16S	6.5 - 8.5	5/17/2002	7.3
SH-16S	6.5 - 8.5	11/19/2003	7.3
SH-17D	6.5 - 8.5	11/20/2003	10.9
SH-17D	6.5 - 8.5	10/5/2006	10.8
SH-17R	6.5 - 8.5	11/20/2003	10.0
SH-17R	6.5 - 8.5	10/4/2006	10.6
SH-17S	6.5 - 8.5	9/6/2001	6.0
SH-17S	6.5 - 8.5	5/20/2002	6.4
SH-17S	6.5 - 8.5	11/19/2003	6.3
SH-17S	6.5 - 8.5	9/25/2006	5.0
SH-18D	6.5 - 8.5	9/4/2001	Data Rejected
SH-18D	6.5 - 8.5	5/15/2002	6.1
SH-18D	6.5 - 8.5	9/26/2006	5.9
SH-18S	6.5 - 8.5	9/4/2001	Data Rejected
SH-18S	6.5 - 8.5	5/15/2002	6.0
SH-18S	6.5 - 8.5	9/26/2006	5.8
SH-19D	6.5 - 8.5	9/5/2001	5.8
SH-19D	6.5 - 8.5	5/16/2002	5.6
SH-19D	6.5 - 8.5	9/25/2006	5.7
SH-19R	6.5 - 8.5	9/5/2001	Data Rejected
SH-19R	6.5 - 8.5	5/16/2002	7.6
SH-19R	6.5 - 8.5	9/28/2006	7.4
SH-19S	6.5 - 8.5	9/5/2001	6.0
SH-19S	6.5 - 8.5	5/21/2002	5.8
SH-19S	6.5 - 8.5	9/29/2006	5.0
SH-20S	6.5 - 8.5	9/5/2001	6.1
SH-20S	6.5 - 8.5	5/17/2002	6.1
SH-21S	6.5 - 8.5	9/6/2001	5.9
SH-21S	6.5 - 8.5	5/16/2002	5.9
SH-21S	6.5 - 8.5	9/26/2006	4.7

TABLE C-4
Summary of Groundwater Data - pH Values Compared to PRGs
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Monitoring Location	Recommended PRG	Collection Date	pH Value (s.u.)
SH-22S	6.5 - 8.5	9/5/2001	Data Rejected
SH-22S	6.5 - 8.5	5/17/2002	6.0
SH-22S	6.5 - 8.5	9/25/2006	6.0
SH-23S	6.5 - 8.5	9/4/2001	6.1
SH-23S	6.5 - 8.5	5/15/2002	6.0
SH-23S	6.5 - 8.5	11/4/2003	6.1
SH-23S	6.5 - 8.5	9/25/2006	5.3
SH-24R	6.5 - 8.5	11/6/2003	7.9
SH-24R	6.5 - 8.5	9/28/2006	7.5
SH-24S	6.5 - 8.5	11/6/2003	5.9
SH-24S	6.5 - 8.5	9/28/2006	5.9
SH-25D	6.5 - 8.5	11/5/2003	6.5
SH-25D	6.5 - 8.5	9/27/2006	Data Rejected
SH-25S	6.5 - 8.5	11/5/2003	6.4
SH-25S	6.5 - 8.5	9/26/2006	6.7
SH-26S	6.5 - 8.5	10/28/2003	11.0
SH-26S	6.5 - 8.5	10/4/2006	10.7
SH-27D	6.5 - 8.5	11/19/2003	6.7
SH-27D	6.5 - 8.5	10/2/2006	6.5
SH-27R	6.5 - 8.5	11/20/2003	6.7
SH-27R	6.5 - 8.5	9/29/2006	6.2
SH-27S	6.5 - 8.5	11/21/2003	5.8
SH-27S	6.5 - 8.5	9/25/2006	6.0
SH-28D	6.5 - 8.5	11/6/2003	6.9
SH-28D	6.5 - 8.5	9/27/2006	6.8
SH-28R	6.5 - 8.5	11/7/2003	7.8
SH-28R	6.5 - 8.5	9/29/2006	6.3
SH-28S	6.5 - 8.5	11/6/2003	5.9
SH-28S	6.5 - 8.5	9/27/2006	5.7
WP-01	6.5 - 8.5	11/4/2003	6.3
WP-01	6.5 - 8.5	9/26/2006	5.8
WP-02	6.5 - 8.5	11/4/2003	6.2
WP-03	6.5 - 8.5	11/5/2003	5.3
WP-03	6.5 - 8.5	9/28/2006	4.5
WP-04	6.5 - 8.5	11/7/2003	5.6
WP-04	6.5 - 8.5	9/27/2006	5.4
WP-05	6.5 - 8.5	11/7/2003	5.2
WP-05	6.5 - 8.5	9/27/2006	4.2
WP-06	6.5 - 8.5	10/28/2003	10.1
WP-06	6.5 - 8.5	10/5/2006	9.8
WP-07	6.5 - 8.5	10/27/2003	10.8

Notes:

1. Samples were collected by Sanborn, Head & Associates, Inc. (SHA) on the dates indicated. See RI Addendum Report (SHA, 2007) for more information (e.g., data validation, sample bias, etc).
2. Shaded cells indicate exceedances of the PRG.

TABLE C-5
Surface Water Analyte Detects Comparison to PRGs
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

	Recommended PRGs	SW-102			SW-103		SW-105			SW-106	
		4/5/2001	8/1/2001	9/29/2006	4/4/2001	8/1/2001	4/4/2001	8/1/2001	9/29/2006	4/4/2001	8/1/2001
		Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Dissolved Metals											
Aluminum †	87	<55.6	<55.6	<50	<55.6	<55.6	<55.6	<55.6	<50	135	328
Copper ‡	4.4	2.0	2.8	1.4	2.1	1.8	1.9	2.3	1.6	5.9	16.2
Lead ‡	1	<1.1	<1.1	<0.5	<1.1	<1.1	<1.1	<1.1	<0.5	7.2	27.9

TABLE C-5
Surface Water Analyte Detects Comparison to PRGs
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

	Recommended PRGs	SW-107			SW-108			SWR-1		SWR-2		SWR-3	
		4/4/2001	8/1/2001	9/29/2006	4/4/2001	8/1/2001	9/29/2006	4/5/2001	8/2/2001	4/5/2001	8/2/2001	4/5/2001	8/2/2001
		Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Dissolved Metals													
Aluminum †	87	<55.6	535	130	<55.6	<55.6	<50	<55.6	<55.6	<55.6	<55.6	<55.6	<55.6
Copper ‡	4.4	2.6	17.8	6.4	2.2	2.0	1.7	1.8	2.3	1.8	1.9	2.2	2.1
Lead ‡	1	3.8	67.4	32.0	<1.1	<1.1	<0.5	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1

TABLE C-5
Surface Water Analyte Detects Comparison to PRGs
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

	Recommended PRGs	SWR-4		SWR-5	
		4/5/2001	8/2/2001	4/5/2001	8/1/2001
		Result	Result	Result	Result
Dissolved Metals					
Aluminum †	87	<55.6	<55.6	<55.6	<55.6
Copper ‡	4.4	2.0	2.3	2.2	1.9
Lead ‡	1	<1.1	<1.1	<1.1	<1.1

Notes:

1. Samples were collected by Sanborn, Head & Associates, Inc. (SHA) on the dates indicated. See RI Addendum Report (SHA, 2007) for more information (e.g., analytical laboratory methods, data validation, sample bias, etc).

2. Only analytes with Preliminary Remediation Goals (PRGs) are presented on the table.

3. Shaded cells indicate exceedances of the PRGs.

TABLE C-6
Summary of Surface Water Data - pH Values Compared to PRGs
Addendum to the RI Report
Phases 1B-4 / 1B-5 Investigations
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Sample Name	Recommended PRG	Measurement Date	pH Value (s.u.)
Neponset River Surface Water Locations			
SW-102	6.5 - 8.3	3/20/2001	6.6
	6.5 - 8.3	4/5/2001	6.2
	6.5 - 8.3	8/1/2001	7.1
	6.5 - 8.3	9/29/2006	7.1
SW-103	6.5 - 8.3	3/20/2001	6.4
	6.5 - 8.3	4/4/2001	6.4
	6.5 - 8.3	8/1/2001	7.2
SW-105	6.5 - 8.3	3/20/2001	7.5
	6.5 - 8.3	4/4/2001	6.9
	6.5 - 8.3	8/1/2001	8.4
	6.5 - 8.3	9/29/2006	7.0
SW-106	6.5 - 8.3	3/20/2001	9.6
	6.5 - 8.3	4/4/2001	10.0
	6.5 - 8.3	8/1/2001	9.3
SW-107	6.5 - 8.3	3/20/2001	8.2
	6.5 - 8.3	4/4/2001	8.2
	6.5 - 8.3	8/1/2001	9.0
	6.5 - 8.3	9/29/2006	8.6
SW-108	6.5 - 8.3	3/20/2001	6.6
	6.5 - 8.3	4/4/2001	6.3
	6.5 - 8.3	8/1/2001	7.0
	6.5 - 8.3	9/29/2006	6.7
Neponset River Surface Water Reference Locations			
SWR-1	6.5 - 8.3	3/20/2001	6.4
	6.5 - 8.3	4/5/2001	6.2
	6.5 - 8.3	8/2/2001	6.9
SWR-2	6.5 - 8.3	3/20/2001	6.3
	6.5 - 8.3	4/5/2001	6.4
	6.5 - 8.3	8/2/2001	6.9
SWR-3	6.5 - 8.3	3/20/2001	6.5
	6.5 - 8.3	4/5/2001	5.5
	6.5 - 8.3	8/2/2001	6.9
SWR-4	6.5 - 8.3	3/20/2001	6.5
	6.5 - 8.3	4/5/2001	6.5
	6.5 - 8.3	8/2/2001	6.9
SWR-5	6.5 - 8.3	3/20/2001	6.5
	6.5 - 8.3	4/5/2001	6.4
	6.5 - 8.3	8/1/2001	7.0

Notes:
1. pH values for surface water were measured by Sanborn, Head & Associates, Inc. (SHA) on the dates indicated.
2. Refer to RI Addendum Report (SHA, 2007) for further information (e.g., data validation, data qualifiers, sample bias, etc).
3. Values reported above have been rounded from values measured in the field.
4. Light shaded cells indicate pHs *below* the PRG range.
Dark shaded cells indicate pHs *above* the PRG range.

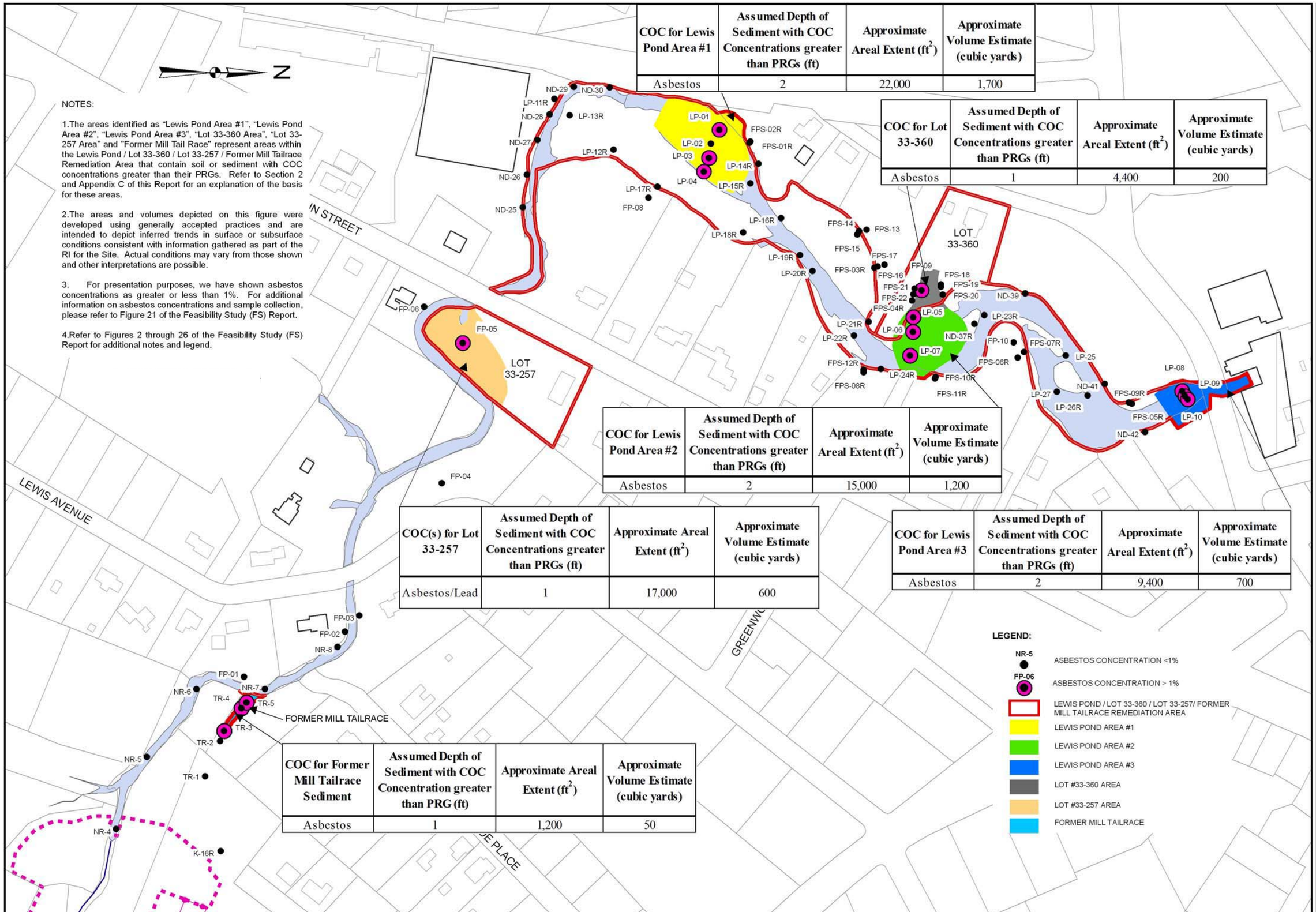
NOTES:

1.The areas identified as "Lewis Pond Area #1", "Lewis Pond Area #2", "Lewis Pond Area #3", "Lot 33-360 Area", "Lot 33-257 Area" and "Former Mill Tail Race" represent areas within the Lewis Pond / Lot 33-360 / Lot 33-257 / Former Mill Tailrace Remediation Area that contain soil or sediment with COC concentrations greater than their PRGs. Refer to Section 2 and Appendix C of this Report for an explanation of the basis for these areas.

2.The areas and volumes depicted on this figure were developed using generally accepted practices and are intended to depict inferred trends in surface or subsurface conditions consistent with information gathered as part of the RI for the Site. Actual conditions may vary from those shown and other interpretations are possible.

3. For presentation purposes, we have shown asbestos concentrations as greater or less than 1%. For additional information on asbestos concentrations and sample collection, please refer to Figure 21 of the Feasibility Study (FS) Report.

4.Refer to Figures 2 through 26 of the Feasibility Study (FS) Report for additional notes and legend.



COC for Lewis Pond Area #1	Assumed Depth of Sediment with COC Concentrations greater than PRGs (ft)	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)
Asbestos	2	22,000	1,700

COC for Lot 33-360	Assumed Depth of Sediment with COC Concentrations greater than PRGs (ft)	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)
Asbestos	1	4,400	200

COC for Lewis Pond Area #2	Assumed Depth of Sediment with COC Concentrations greater than PRGs (ft)	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)
Asbestos	2	15,000	1,200

COC(s) for Lot 33-257	Assumed Depth of Sediment with COC Concentrations greater than PRGs (ft)	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)
Asbestos/Lead	1	17,000	600

COC for Lewis Pond Area #3	Assumed Depth of Sediment with COC Concentrations greater than PRGs (ft)	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)
Asbestos	2	9,400	700

COC for Former Mill Tailrace Sediment	Assumed Depth of Sediment with COC Concentration greater than PRG (ft)	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)
Asbestos	1	1,200	50

NO.	DATE	DESCRIPTION	BY

FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

PROPOSED SEDIMENT EXCAVATION VOLUME - LEWIS POND, LOTS 33-257 & 33-360, AND FORMER MILL TAILRACE

PROJECT NUMBER: 2032.01

FIGURE NUMBER: C-1

NOTES:

1.The areas identified as "Lewis Pond Area #1", "Lewis Pond Area #2", "Lewis Pond Area #3", "Lot 33-360 Area", "Lot 33-257 Area" and "Former Mill Tail Race" represent areas within the Lewis Pond / Lot 33-360 / Lot 33-257 / Former Mill Tailrace Remediation Area that contain soil or sediment with COC concentrations greater than their PRGs. Refer to Section 2 and Appendix C of this Report for an explanation of the basis for these areas.

2.The areas and volumes depicted on this figure were developed using generally accepted practices and are intended to depict inferred trends in surface or subsurface conditions consistent with information gathered as part of the RI for the Site. Actual conditions may vary from those shown and other interpretations are possible.

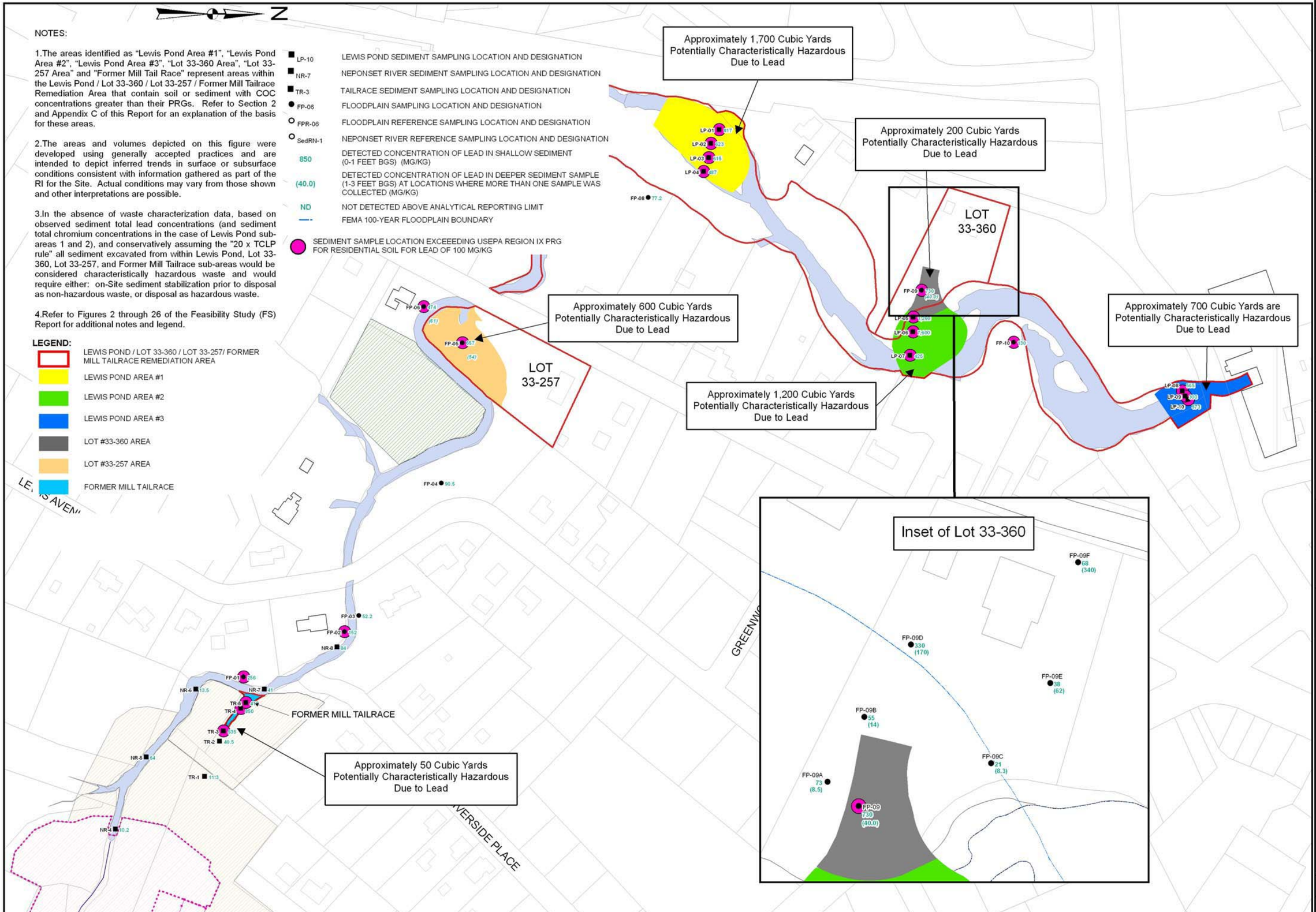
3.In the absence of waste characterization data, based on observed sediment total lead concentrations (and sediment total chromium concentrations in the case of Lewis Pond sub-areas 1 and 2), and conservatively assuming the "20 x TCLP rule" all sediment excavated from within Lewis Pond, Lot 33-360, Lot 33-257, and Former Mill Tailrace sub-areas would be considered characteristically hazardous waste and would require either: on-Site sediment stabilization prior to disposal as non-hazardous waste, or disposal as hazardous waste.

4.Refer to Figures 2 through 26 of the Feasibility Study (FS) Report for additional notes and legend.

LEGEND:

- LEWIS POND / LOT 33-360 / LOT 33-257/ FORMER MILL TAILRACE REMEDIATION AREA
- LEWIS POND AREA #1
- LEWIS POND AREA #2
- LEWIS POND AREA #3
- LOT #33-360 AREA
- LOT #33-257 AREA
- FORMER MILL TAILRACE

- LP-10 — LEWIS POND SEDIMENT SAMPLING LOCATION AND DESIGNATION
- NR-7 — NEPONSET RIVER SEDIMENT SAMPLING LOCATION AND DESIGNATION
- TR-3 — TAILRACE SEDIMENT SAMPLING LOCATION AND DESIGNATION
- FP-06 — FLOODPLAIN SAMPLING LOCATION AND DESIGNATION
- FPR-06 — FLOODPLAIN REFERENCE SAMPLING LOCATION AND DESIGNATION
- SedRN-1 — NEPONSET RIVER REFERENCE SAMPLING LOCATION AND DESIGNATION
- 850 — DETECTED CONCENTRATION OF LEAD IN SHALLOW SEDIMENT (0-1 FEET BGS) (MG/KG)
- (40.0) — DETECTED CONCENTRATION OF LEAD IN DEEPER SEDIMENT SAMPLE (1-3 FEET BGS) AT LOCATIONS WHERE MORE THAN ONE SAMPLE WAS COLLECTED (MG/KG)
- ND — NOT DETECTED ABOVE ANALYTICAL REPORTING LIMIT
- FEMA 100-YEAR FLOODPLAIN BOUNDARY
- SEDIMENT SAMPLE LOCATION EXCEEEDING USEPA REGION IX PRG FOR RESIDENTIAL SOIL FOR LEAD OF 100 MG/KG



NO.	DATE	DESCRIPTION	BY

FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

LEAD CONCENTRATIONS REVIEWED FOR POSSIBLE OFF-SITE DISPOSAL-SEDIMENT IN LEWIS POND, LOTS 33-257 & 33-360, AND FORMER MILL TAILRACE

PROJECT NUMBER 2032.01

FIGURE NUMBER C-2

NOTES:

1. The distribution of arsenic in upper soils (0 to 1 foot below the ground surface) is based on samples collected by SHA personnel between February 21 and July 23, 2001. Samples were analyzed by Woods Hole Group Environmental Laboratory of Raynham, Massachusetts for metals, including arsenic, using United States Environmental Protect Agency (USEPA) Method 6010B/6020.

2. In the absence of waste characterization data, based on observed total arsenic soil concentrations in SB-04, and conservatively assuming the "20 x TCLP rule", soil excavated from the area south of the Neponset River would be considered characteristically hazardous waste and would require either: on-Site sediment stabilization prior to disposal as non-hazardous waste, or disposal as hazardous waste.

3. The arsenic concentration at soil boring SB-32 (35.7 mg/kg) is greater than the PRG for arsenic of 26 mg/kg; however, soil from the SB-32 boring area will not be included in the volume of soil requiring remediation, as the Baseline Human Health Risk Assessment (BHHRA) did not predict "actionable risk" from arsenic in soil in this portion of the Site.

4. Refer to the RI Report (SHA, 2007) for a discussion of soil sampling methods.

5. Refer to Figures 2 through 31 of the Feasibility Study (FS) Report for additional notes and legend.

LEGEND:

SB-01 — SOIL BORING LOCATION / DESIGNATION

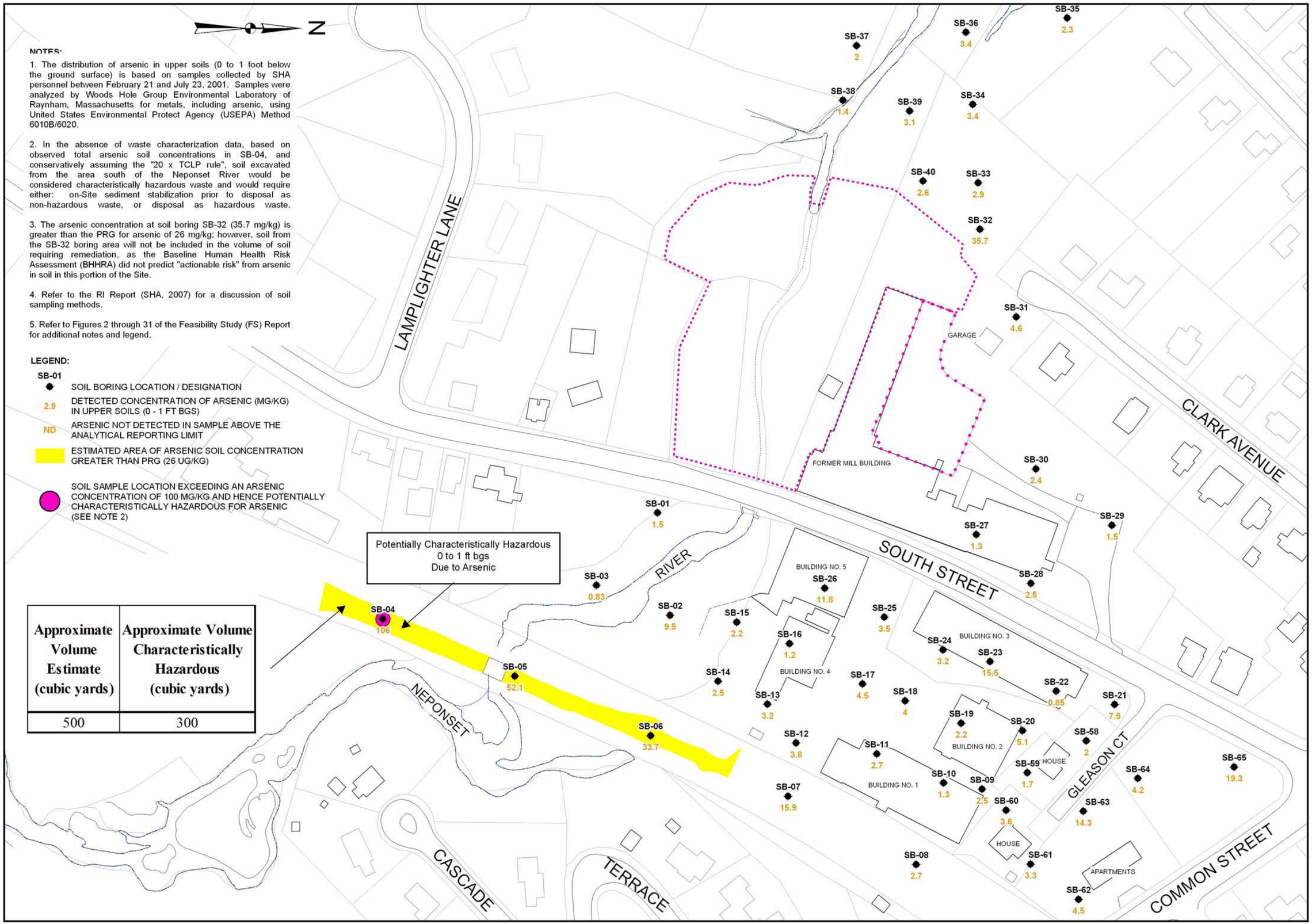
2.9 — DETECTED CONCENTRATION OF ARSENIC (MG/KG) IN UPPER SOILS (0 - 1 FT BGS)

ND — ARSENIC NOT DETECTED IN SAMPLE ABOVE THE ANALYTICAL REPORTING LIMIT

ESTIMATED AREA OF ARSENIC SOIL CONCENTRATION GREATER THAN PRG (26 UG/KG)

SOIL SAMPLE LOCATION EXCEEDING AN ARSENIC CONCENTRATION OF 100 MG/KG AND HENCE POTENTIALLY CHARACTERISTICALLY HAZARDOUS FOR ARSENIC (SEE NOTE 2)

Approximate Volume Estimate (cubic yards)	Approximate Volume Characteristically Hazardous (cubic yards)
500	300



NO.	DATE	DESCRIPTION	BY

FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

PROPOSED SOIL EXCAVATION VOLUME - ARSENIC IN EOSS AREA

PROJECT NUMBER: 2032.01

FIGURE NUMBER: C-3

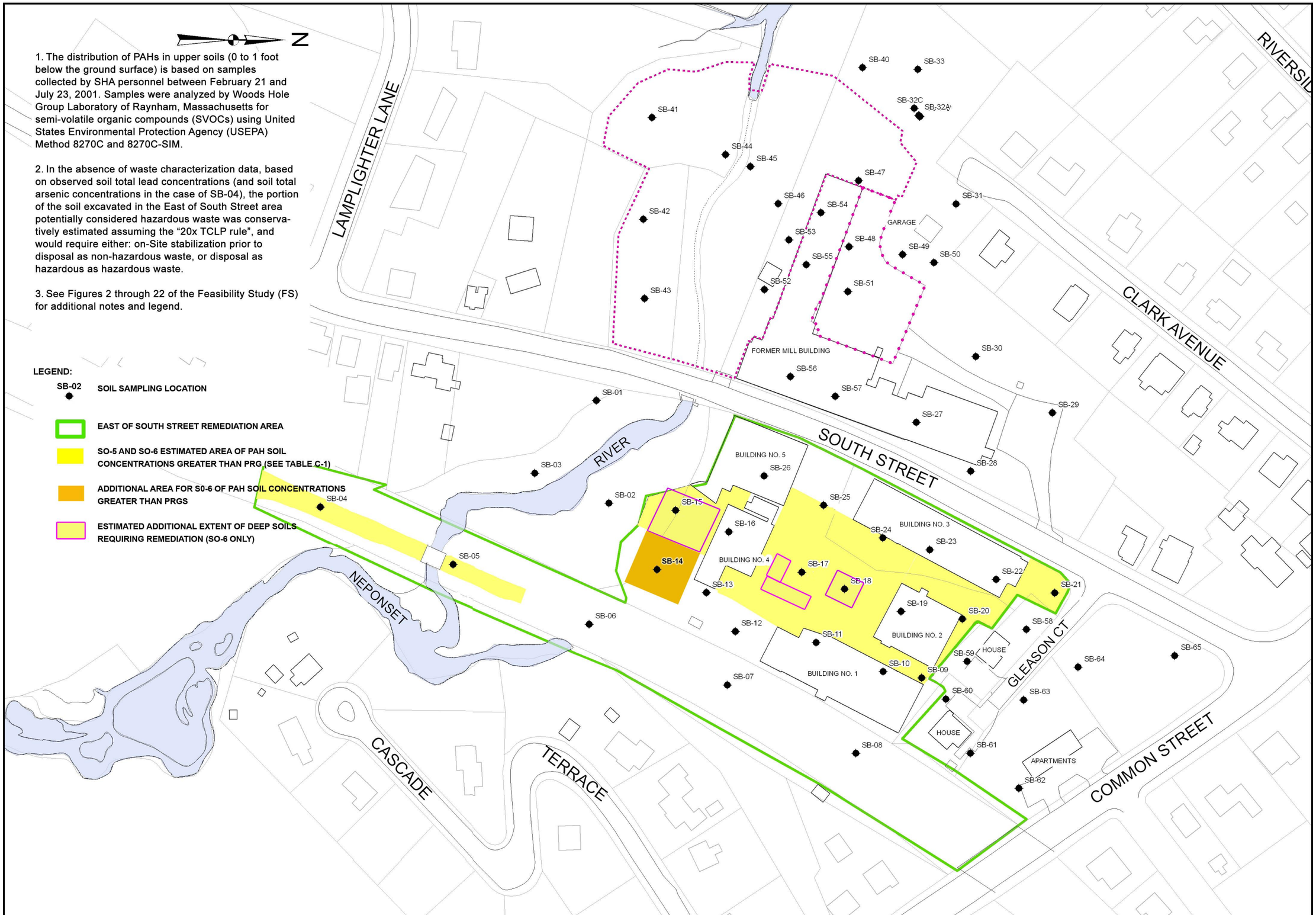
1. The distribution of PAHs in upper soils (0 to 1 foot below the ground surface) is based on samples collected by SHA personnel between February 21 and July 23, 2001. Samples were analyzed by Woods Hole Group Laboratory of Raynham, Massachusetts for semi-volatile organic compounds (SVOCs) using United States Environmental Protection Agency (USEPA) Method 8270C and 8270C-SIM.

2. In the absence of waste characterization data, based on observed soil total lead concentrations (and soil total arsenic concentrations in the case of SB-04), the portion of the soil excavated in the East of South Street area potentially considered hazardous waste was conservatively estimated assuming the "20x TCLP rule", and would require either: on-Site stabilization prior to disposal as non-hazardous waste, or disposal as hazardous as hazardous waste.

3. See Figures 2 through 22 of the Feasibility Study (FS) for additional notes and legend.

LEGEND:

- SB-02 — SOIL SAMPLING LOCATION
- EAST OF SOUTH STREET REMEDIATION AREA
- SO-5 AND SO-6 ESTIMATED AREA OF PAH SOIL CONCENTRATIONS GREATER THAN PRG (SEE TABLE C-1)
- ADDITIONAL AREA FOR S0-6 OF PAH SOIL CONCENTRATIONS GREATER THAN PRGS
- ESTIMATED ADDITIONAL EXTENT OF DEEP SOILS REQUIRING REMEDIATION (SO-6 ONLY)



NO.	DATE	DESCRIPTION	BY

GRAPHICAL SCALE: 60 0 60 120 180 Feet

FIGURE ORIGINATED FROM SHA'S OCT. 2007 DRAFT FS

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FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

SO-5 AND SO-6 PROPOSED SOIL EXCAVATION VOLUME - PAHS IN EOSS AREA

PROJECT NUMBER: 2032.01

FIGURE NUMBER: C-4

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Applicable Alternatives	Contaminants of Concern	Primary Remediation Target	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)	Estimated Volume Characteristically Hazardous (cubic yards)	Estimated Volume Non-Hazardous (cubic yards)
SO-5	Arsenic and PAHs	1 to 2 ft bgs	67,000	2,700	1,900	800
SO-6	Arsenic and PAHs	Varies	71,900	7,800	2,700	5,100

N

NOTES:

1. In the absence of waste characterization data, based on observed soil total lead concentrations (and soil total arsenic concentrations in the case of SB-04), the portion of the soil excavated in the East of South Street area potentially considered hazardous was conservatively estimated assuming the "20x TCLP rule", and would require either: on-Site stabilization prior to disposal as non-hazardous waste, or disposal as hazardous waste.

2. Refer to Figures C-3 and C-4 in Appendix C of this report for concentrations of arsenic and polycyclic aromatic hydrocarbons (PAHs) in soil.

3. See Figures 2 through 22 of the Feasibility Study (FS) for additional notes and legend.

LEGEND:

SB-02 SOIL SAMPLING LOCATION

EAST OF SOUTH STREET REMEDIATION AREA

ESTIMATED REMEDIATION TARGET AREA (SO-5 AND 6)

ESTIMATED EXTENT OF DEEP SOILS REQUIRING REMEDIATION (S0-6 ONLY)

ESTIMATED ADDITIONAL EXTENT OF DEEP SOILS REQUIRING REMEDIATION (SO-6 ONLY)

Potentially Characteristically Hazardous
0 to 1 ft bgs
Due to Arsenic

Potentially Characteristically Hazardous
0 to 1 ft bgs
Due to Lead

LAMPLIGHTER LA
RIVERSID
CLARK AVENUE
SOUTH STREET
NEPONSET RIVER
CASCADE TERRACE
GLEASON CT
COMMON STREET
FORMER MILL BUILDING
GARAGE
BUILDING NO. 1
BUILDING NO. 2
BUILDING NO. 3
BUILDING NO. 4
BUILDING NO. 5
HOUSE
APARTMENTS

SB-01 SB-02 SB-03 SB-04 SB-05 SB-06 SB-07 SB-08 SB-09 SB-10 SB-11 SB-12 SB-13 SB-14 SB-15 SB-16 SB-17 SB-18 SB-19 SB-20 SB-21 SB-22 SB-23 SB-24 SB-25 SB-26 SB-27 SB-28 SB-29 SB-30 SB-31 SB-42 SB-43 SB-46 SB-47 SB-48 SB-49 SB-50 SB-51 SB-52 SB-53 SB-54 SB-55 SB-56 SB-57 SB-58 SB-59 SB-60 SB-61 SB-62 SB-63 SB-64 SB-65

GRAPHICAL SCALE
Feet
60 0 60 120 180

FIGURE ORIGINATED FROM SHA'S OCT. 2007 DRAFT FS

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FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

PROPOSED SOIL EXCAVATION VOLUME - ARSENIC AND PAHS IN EOSS AREA

PROJECT NUMBER : 2032.01

FIGURE NUMBER : C-4A

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FILE: S:\CADDATA\2006\2032.01\Verified\Figures\FS_V01\Appendix\Fig-C4A_Prio_Soil_Volume_EOSS_20071022.mxd
PDF FILE:
PLOT DATE: 10-22-07

NOTES:

1. The distribution of asbestos concentrations shown for on-Site soil is based on data obtained by EPA's contractor, Metcalf & Eddy, Inc. (M&E)

2. Concentrations in soil samples collected from these soil borings are based on information in M&E's "Data Evaluation Report for Additional Asbestos Investigations, Blackburn & Union Privileges Superfund Site, Walpole, Massachusetts" dated September 2006 (M&E Asbestos report).

3. Refer to Figures 2 and 4 of the Feasibility Study (FS) Report for additional notes and legend.

LEGEND:

M-5.5 ▲ METCALF & EDDY SAMPLE LOCATION / DESIGNATION

ND ASBESTOS NOT DETECTED IN SAMPLE ABOVE THE ANALYTICAL REPORTING LIMIT

1.75 DETECTED CONCENTRATION OF ASBESTOS (%)

<0.25 ASBESTOS WAS NOT DETECTED ABOVE THE ANALYTICAL REPORTING LIMIT OF 0.25%; HOWEVER, THE ANALYST OBSERVED ASBESTOS FIBERS IN THE SOIL SAMPLE

(1.75) DETECTED CONCENTRATION OF ASBESTOS (%) IN THE DEEPER SOIL SAMPLE AT BORING LOCATIONS WHERE MORE THAN ONE SAMPLE WAS COLLECTED

SOIL-CAPPED AOC

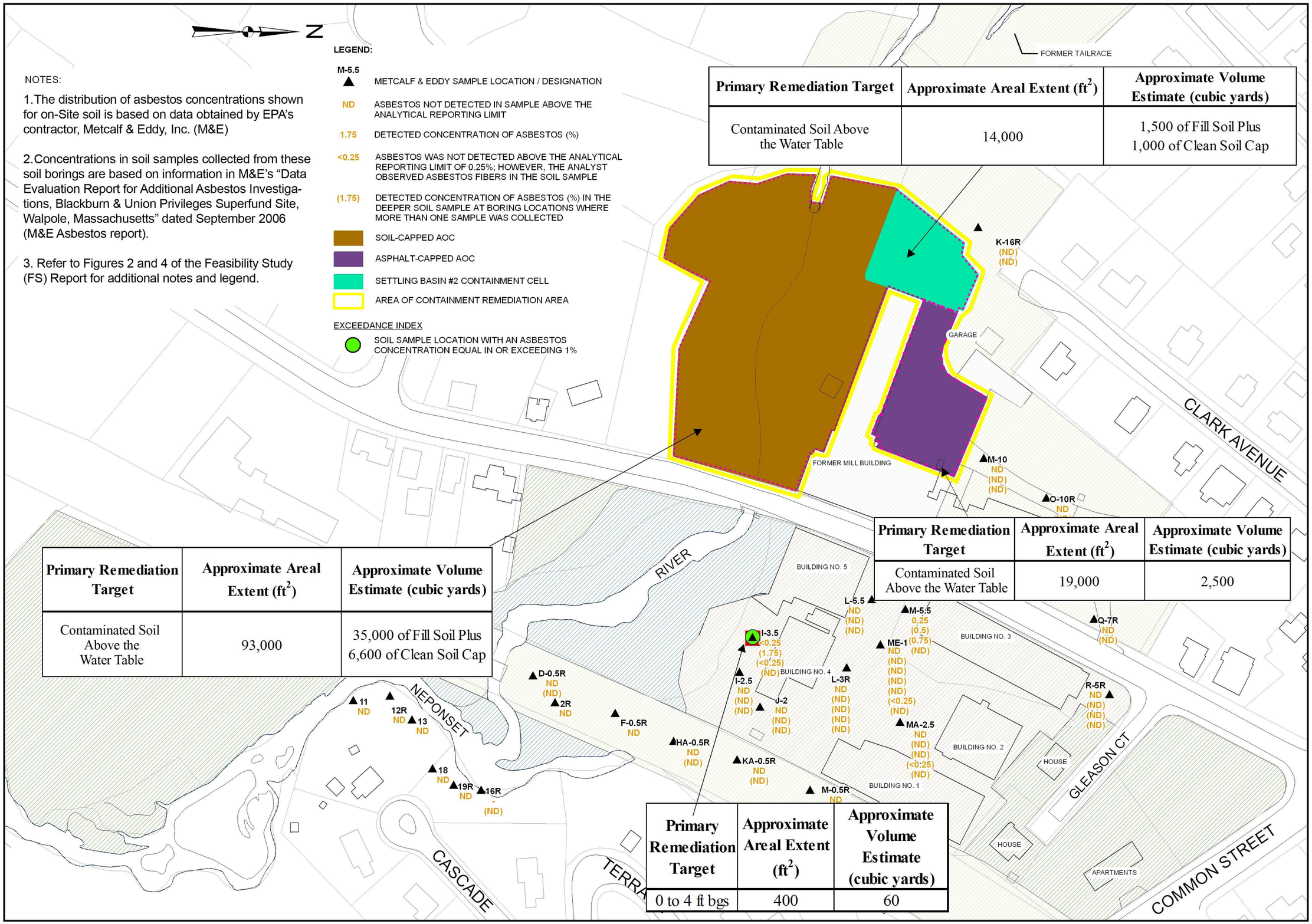
ASPHALT-CAPPED AOC

SETTLING BASIN #2 CONTAINMENT CELL

AREA OF CONTAINMENT REMEDIATION AREA

EXCEEDANCE INDEX

SOIL SAMPLE LOCATION WITH AN ASBESTOS CONCENTRATION EQUAL IN OR EXCEEDING 1%



Primary Remediation Target	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)
Contaminated Soil Above the Water Table	14,000	1,500 of Fill Soil Plus 1,000 of Clean Soil Cap

Primary Remediation Target	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)
Contaminated Soil Above the Water Table	19,000	2,500

Primary Remediation Target	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)
Contaminated Soil Above the Water Table	93,000	35,000 of Fill Soil Plus 6,600 of Clean Soil Cap

Primary Remediation Target	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)
0 to 4 ft bgs	400	60

NO.	DATE	DESCRIPTION	BY

GRAPHICAL SCALE
60 0 60 120 180 Feet

FIGURE ORIGINATED FROM SHA'S OCT. 2007 DRAFT FS

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FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

ESTIMATED ASBESTOS-IMPACTED SOIL VOLUME - INCLUDING AOC FILL SOILS

PROJECT NUMBER: 2032.01

FIGURE NUMBER: C-5

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PDF FILE
PLOT DATE: 10-10-07

Assumed Depth of Soil COC greater than PRG (ft)	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)	Estimated Volume Characteristically Hazardous (cubic yards)	Estimated Volume Non-Hazardous (cubic yards)
0 to 6	1,700	400	100	300

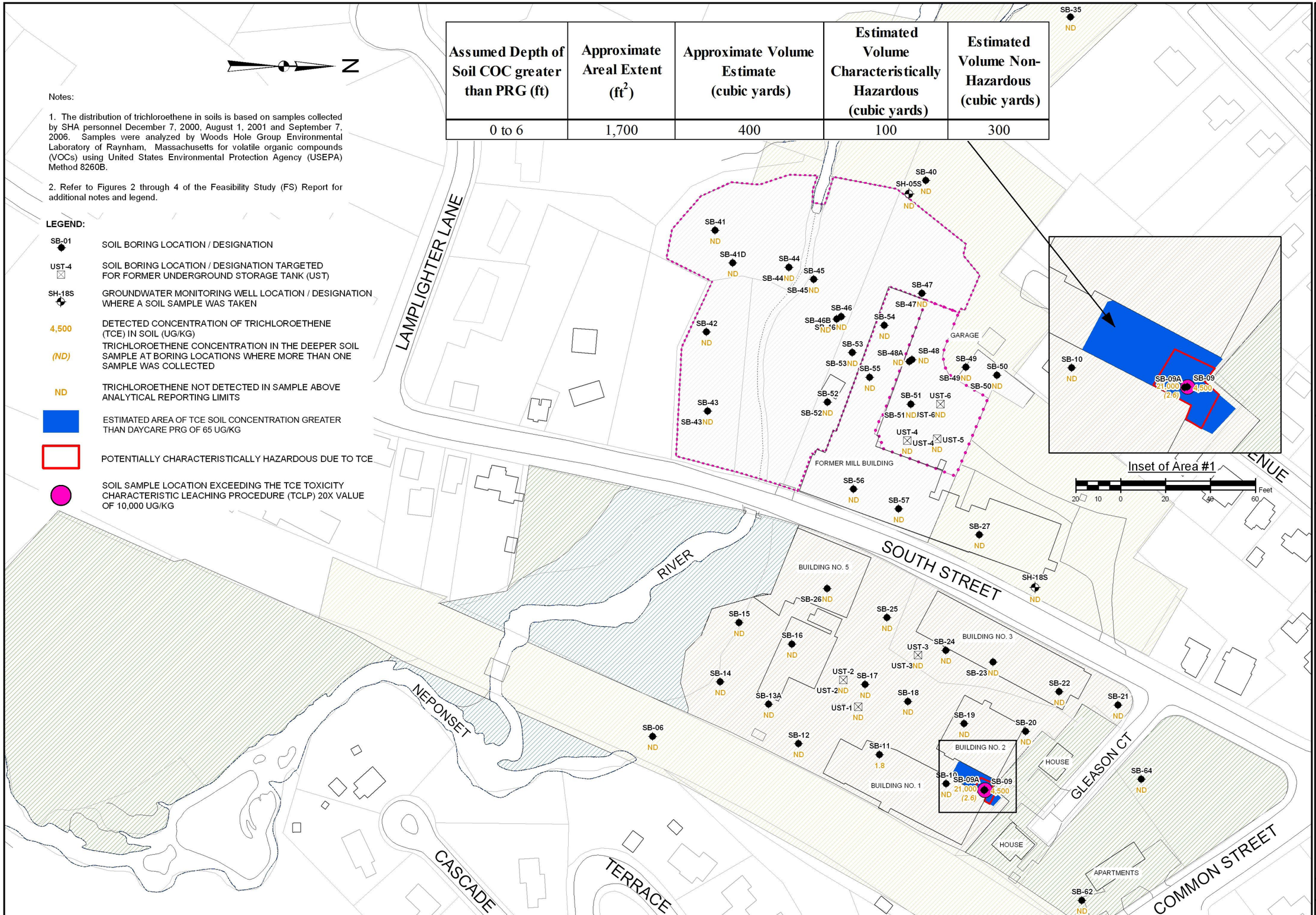
Notes:

1. The distribution of trichloroethene in soils is based on samples collected by SHA personnel December 7, 2000, August 1, 2001 and September 7, 2006. Samples were analyzed by Woods Hole Group Environmental Laboratory of Raynham, Massachusetts for volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Method 8260B.

2. Refer to Figures 2 through 4 of the Feasibility Study (FS) Report for additional notes and legend.

LEGEND:

- SB-01 — SOIL BORING LOCATION / DESIGNATION
- UST-4 — SOIL BORING LOCATION / DESIGNATION TARGETED FOR FORMER UNDERGROUND STORAGE TANK (UST)
- SH-18S — GROUNDWATER MONITORING WELL LOCATION / DESIGNATION WHERE A SOIL SAMPLE WAS TAKEN
- 4,500 — DETECTED CONCENTRATION OF TRICHLOROETHENE (TCE) IN SOIL (UG/KG)
- (ND) — TRICHLOROETHENE CONCENTRATION IN THE DEEPER SOIL SAMPLE AT BORING LOCATIONS WHERE MORE THAN ONE SAMPLE WAS COLLECTED
- ND — TRICHLOROETHENE NOT DETECTED IN SAMPLE ABOVE ANALYTICAL REPORTING LIMITS
- ESTIMATED AREA OF TCE SOIL CONCENTRATION GREATER THAN DAYCARE PRG OF 65 UG/KG
- POTENTIALLY CHARACTERISTICALLY HAZARDOUS DUE TO TCE
- SOIL SAMPLE LOCATION EXCEEDING THE TCE TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP) 20X VALUE OF 10,000 UG/KG



NO.	DATE	DESCRIPTION	BY

GRAPHICAL SCALE 60 0 60 120 180 Feet

FIGURE ORIGINATED FROM SHA'S OCT. 2007 DRAFT FS

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FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

PROPOSED SOIL EXCAVATION VOLUME - TCE IN EAST OF SOUTH STREET AREA

PROJECT NUMBER: 2032.01

FIGURE NUMBER: C-6A

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PLOT DATE: 10-9-07

Assumed Depth of Soil COC greater than PRG (ft)	Approximate Areal Extent (ft^2)	Approximate Volume Estimate (cubic yards)	Estimated Volume Characteristically Hazardous (cubic yards)	Estimated Volume Non-Hazardous (cubic yards)
0 to 6	1,700	400	100	300

Notes:

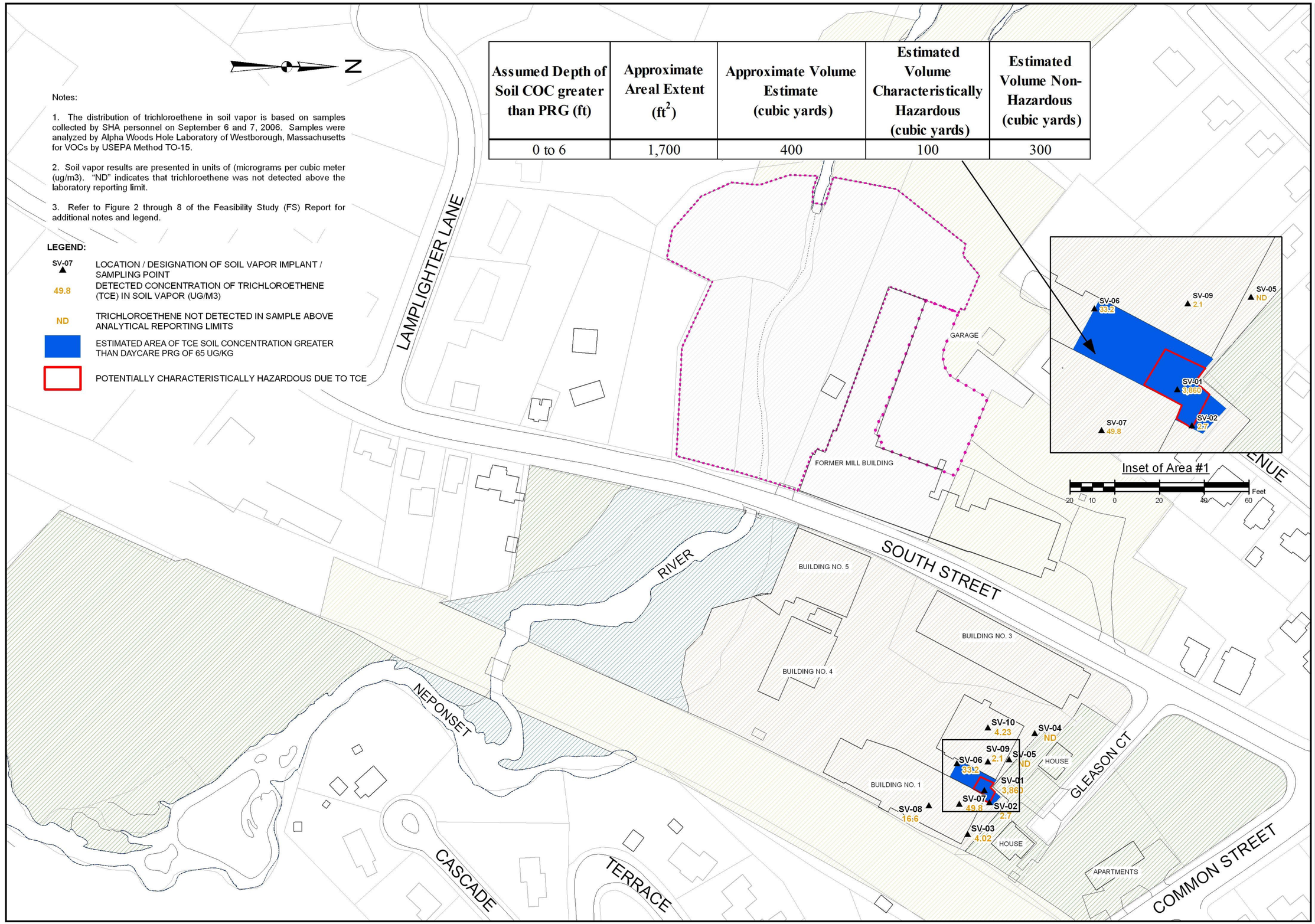
1. The distribution of trichloroethene in soil vapor is based on samples collected by SHA personnel on September 6 and 7, 2006. Samples were analyzed by Alpha Woods Hole Laboratory of Westborough, Massachusetts for VOCs by USEPA Method TO-15.

2. Soil vapor results are presented in units of (micrograms per cubic meter (ug/m3). "ND" indicates that trichloroethene was not detected above the laboratory reporting limit.

3. Refer to Figure 2 through 8 of the Feasibility Study (FS) Report for additional notes and legend.

LEGEND:

- SV-07 ▲ — LOCATION / DESIGNATION OF SOIL VAPOR IMPLANT / SAMPLING POINT
- 49.8 — DETECTED CONCENTRATION OF TRICHLOROETHENE (TCE) IN SOIL VAPOR (UG/M3)
- ND — TRICHLOROETHENE NOT DETECTED IN SAMPLE ABOVE ANALYTICAL REPORTING LIMITS
- ESTIMATED AREA OF TCE SOIL CONCENTRATION GREATER THAN DAYCARE PRG OF 65 UG/KG
- POTENTIALLY CHARACTERISTICALLY HAZARDOUS DUE TO TCE



GRAPHICAL SCALE
60 0 60 120 180 Feet

FIGURE ORIGINATED FROM SHA'S OCT. 2007 DRAFT FS

NO.	DATE	DESCRIPTION	BY

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FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

TCE CONCENTRATIONS IN SOIL VAPOR - EAST OF SOUTH STREET AREA

PROJECT NUMBER: 2032.01

FIGURE NUMBER: C-6B

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PLOT DATE: 10-10-07

NOTES:

1.The areas identified as "East of South Street Area #1", "East of South Street Area #2", and "East of South Street Area #3" represent areas where soil COC concentrations exceed PRGs. Refer to Section 2 and text of Appendix C of this Report for an explanation of the basis for these areas.

2.The areas and volumes presented on this figure were developed using generally accepted practices and are intended to depict inferred trends in surface and subsurface conditions consistent with information gathered as part of the RI for the Site. Actual conditions may vary from those shown and other interpretations are possible.

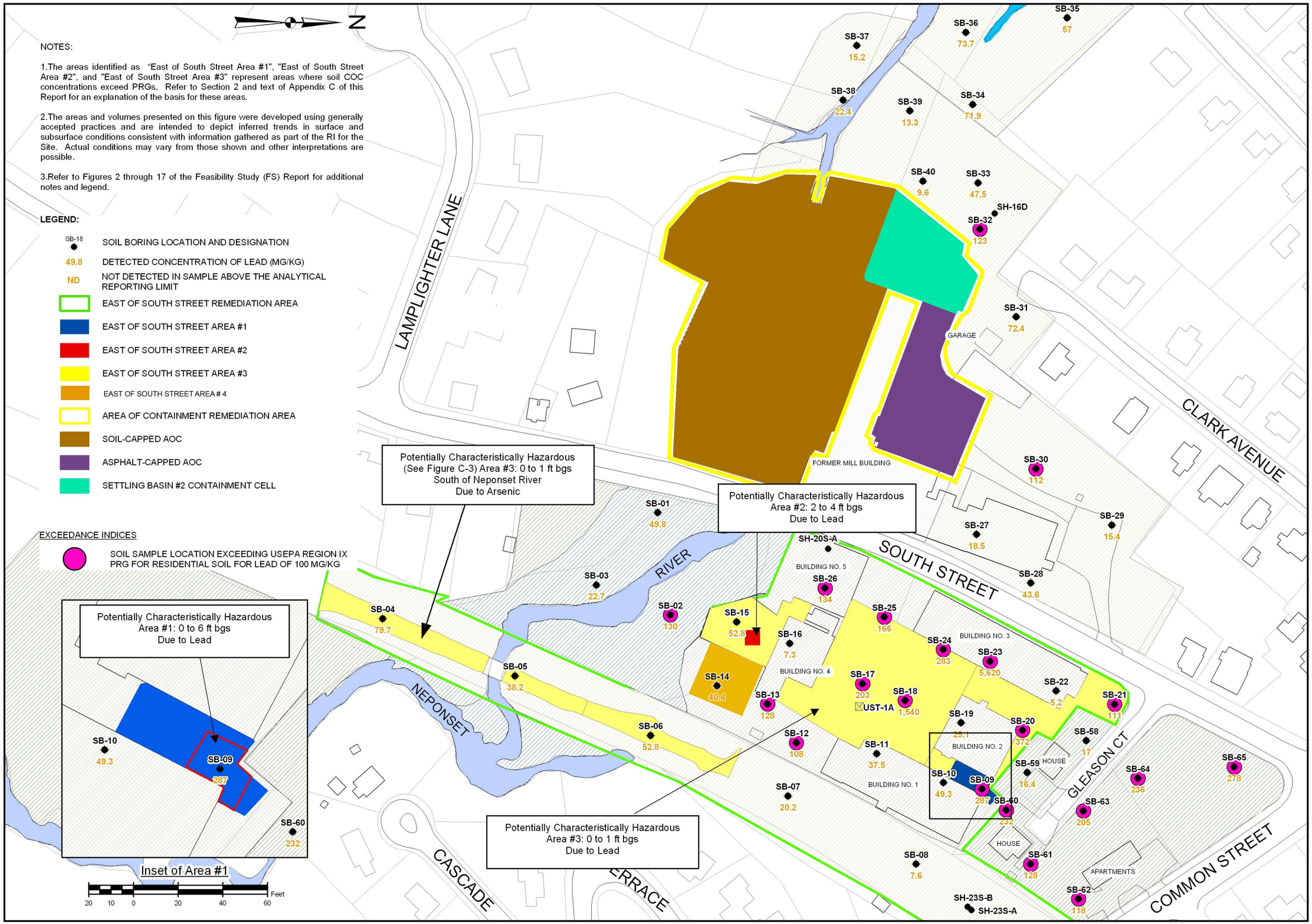
3.Refer to Figures 2 through 17 of the Feasibility Study (FS) Report for additional notes and legend.

LEGEND:

- SB-18 — SOIL BORING LOCATION AND DESIGNATION
- 49.8 — DETECTED CONCENTRATION OF LEAD (MG/KG)
- ND — NOT DETECTED IN SAMPLE ABOVE THE ANALYTICAL REPORTING LIMIT
- EAST OF SOUTH STREET REMEDIATION AREA
- EAST OF SOUTH STREET AREA #1
- EAST OF SOUTH STREET AREA #2
- EAST OF SOUTH STREET AREA #3
- EAST OF SOUTH STREET AREA # 4
- AREA OF CONTAINMENT REMEDIATION AREA
- SOIL-CAPPED AOC
- ASPHALT-CAPPED AOC
- SETTLING BASIN #2 CONTAINMENT CELL

EXCEEDANCE INDICES

- SOIL SAMPLE LOCATION EXCEEDING USEPA REGION IX PRG FOR RESIDENTIAL SOIL FOR LEAD OF 100 MG/KG



NO.	DATE	DESCRIPTION	BY

GRAPHICAL SCALE 60 0 60 120 180 Feet

FIGURE ORIGINATED FROM SHA'S OCT. 2007 DRAFT FS

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FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

LEAD CONCENTRATIONS IN UPPER SOILS REVIEWED FOR POSSIBLE OFF-SITE DISPOSAL EOSS AREA AND AOC

PROJECT NUMBER: 2032.01

FIGURE NUMBER: C-7A

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NOTES:

1.The areas identified as "East of South Street Area #1", "East of South Street Area #2", and "East of South Street Area #3" represent areas where soil COC concentrations exceed PRGs. Refer to Section 2 and text of Appendix C of this Report for an explanation of the basis for these areas.

2.The areas and volumes presented on this figure were developed using generally accepted practices and are intended to depict inferred trends in surface and subsurface conditions consistent with information gathered as part of the RI for the Site. Actual conditions may vary from those shown and other interpretations are possible.

3. East of South Street Area #3 not indicated on figure because targeted soils are limited to 0 to 2 ft bgs.

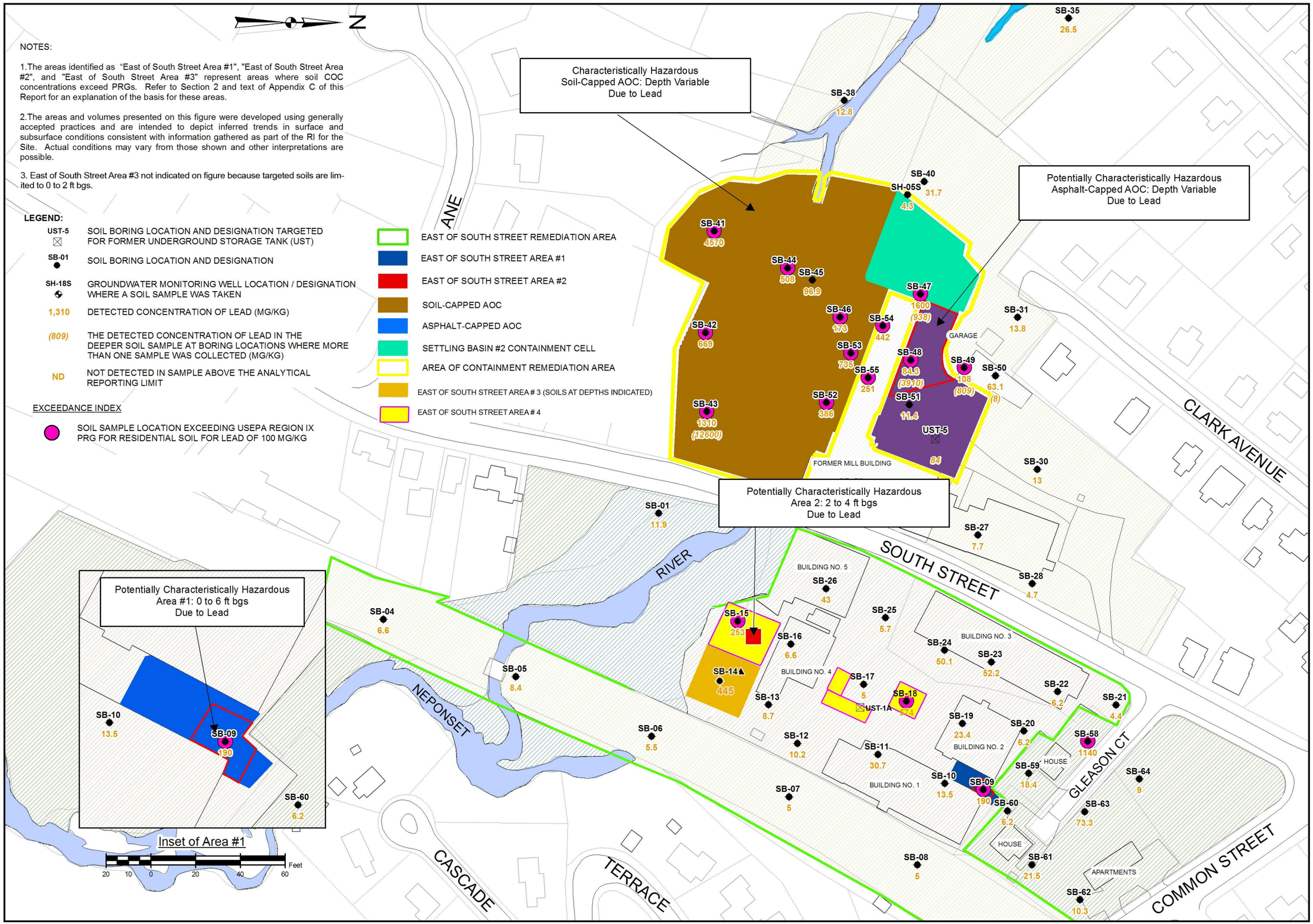
LEGEND:

UST-5	SOIL BORING LOCATION AND DESIGNATION TARGETED FOR FORMER UNDERGROUND STORAGE TANK (UST)
SB-01	SOIL BORING LOCATION AND DESIGNATION
SH-18S	GROUNDWATER MONITORING WELL LOCATION / DESIGNATION WHERE A SOIL SAMPLE WAS TAKEN
1,310	DETECTED CONCENTRATION OF LEAD (MG/KG)
(809)	THE DETECTED CONCENTRATION OF LEAD IN THE DEEPER SOIL SAMPLE AT BORING LOCATIONS WHERE MORE THAN ONE SAMPLE WAS COLLECTED (MG/KG)
ND	NOT DETECTED IN SAMPLE ABOVE THE ANALYTICAL REPORTING LIMIT

EXCEEDANCE INDEX

SOIL SAMPLE LOCATION EXCEEDING USEPA REGION IX PRG FOR RESIDENTIAL SOIL FOR LEAD OF 100 MG/KG

EAST OF SOUTH STREET REMEDIATION AREA
EAST OF SOUTH STREET AREA #1
EAST OF SOUTH STREET AREA #2
SOIL-CAPPED AOC
ASPHALT-CAPPED AOC
SETTLING BASIN #2 CONTAINMENT CELL
AREA OF CONTAINMENT REMEDIATION AREA
EAST OF SOUTH STREET AREA # 3 (SOILS AT DEPTHS INDICATED)
EAST OF SOUTH STREET AREA # 4



NO.	DATE	DESCRIPTION	BY

GRAPHICAL SCALE 60 0 60 120 180 Feet

FIGURE ORIGINATED FROM SHA'S OCT. 2007 DRAFT FS

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FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

LEAD CONCENTRATIONS IN LOWER SOILS REVIEWED FOR POSSIBLE OFF-SITE DISPOSAL EOSS AREA AND AOC

PROJECT NUMBER: 2032.01

FIGURE NUMBER: C-7B

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FILE: S:\CONDATA\2000\2032.01\Active\Figures\FS_V01\Appendix\F\fig7B_Lead_LS.mxd, EOSS_100307.mxd
PLOT SCALE: 1:
PLOT DATE: 10.03.07

Notes:

1. The "Inferred Area with Groundwater and Surface Water COC Concentrations Greater Than PRGs" represents the extent of groundwater and surface water COC concentrations that exceed PRGs. Refer to Section 2 and text of Appendix C of this Report for an explanation of the basis for this area.

2. The area was developed using generally accepted hydrogeologic practices and is intended to depict inferred trends in subsurface conditions consistent with information gathered as part of the RI for the Site. Actual conditions may vary from those shown and other interpretations are possible.

3. Refer to Figures 2 through 22 of the Feasibility Study (FS) Report for additional notes and legend.

LEGEND:

- SH-01S — GROUNDWATER MONITORING WELL LOCATION/DESIGNATION
- WP-02 — WELL POINT LOCATION / DESIGNATION
- SW-108 — SURFACE WATER SAMPLE LOCATION / DESIGNATION
- SWR-3 — SURFACE WATER REFERENCE SAMPLE LOCATION / DESIGNATION
- 148 — GROUNDWATER ELEVATION CONTOUR SEPTEMBER 2006 (FEET ANSL)
- INFERRED AREA WITH GROUNDWATER COC CONCENTRATIONS GREATER THAN PRGs
- INFERRED AREA WITH SURFACE WATER COC CONCENTRATIONS GREATER THAN PRGs (FORMER MILL TAILRACE)

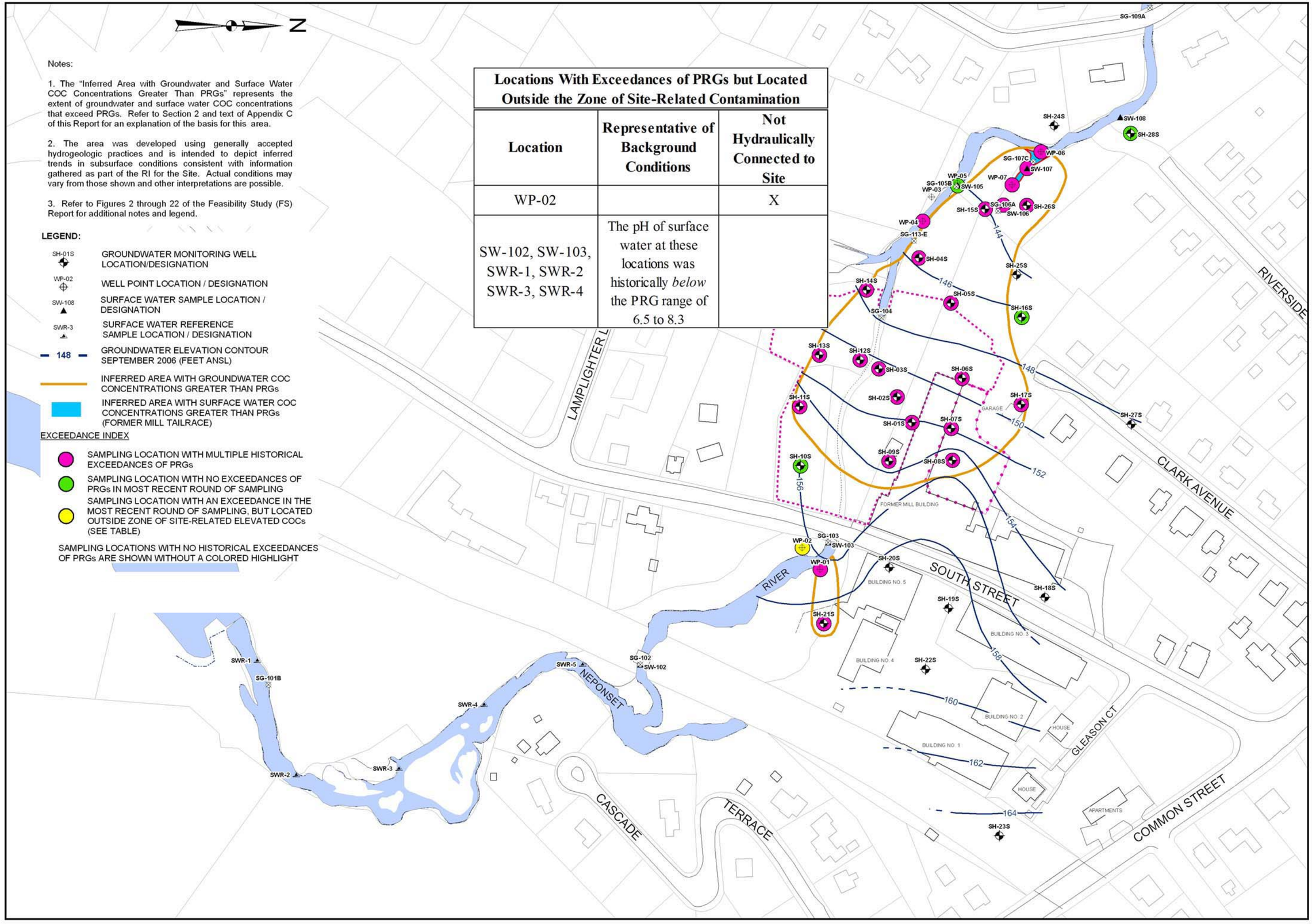
EXCEEDANCE INDEX

- SAMPLING LOCATION WITH MULTIPLE HISTORICAL EXCEEDANCES OF PRGs
- SAMPLING LOCATION WITH NO EXCEEDANCES OF PRGs IN MOST RECENT ROUND OF SAMPLING
- SAMPLING LOCATION WITH AN EXCEEDANCE IN THE MOST RECENT ROUND OF SAMPLING, BUT LOCATED OUTSIDE ZONE OF SITE-RELATED ELEVATED COCs (SEE TABLE)

SAMPLING LOCATIONS WITH NO HISTORICAL EXCEEDANCES OF PRGs ARE SHOWN WITHOUT A COLORED HIGHLIGHT

Locations With Exceedances of PRGs but Located Outside the Zone of Site-Related Contamination

Location	Representative of Background Conditions	Not Hydraulically Connected to Site
WP-02		X
SW-102, SW-103, SWR-1, SWR-2 SWR-3, SWR-4	The pH of surface water at these locations was historically *below* the PRG range of 6.5 to 8.3	



NO.	DATE	DESCRIPTION	BY

GRAPHICAL SCALE — Feet: 80, 0, 80, 160, 240

FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

SHALLOW GROUNDWATER (AND SURFACE WATER) WITH COC CONCENTRATIONS GREATER THAN PRGS

PROJECT NUMBER 2032.01

FIGURE NUMBER C-8

Notes:

1. The "Inferred Area with Groundwater COC Concentrations Greater Than PRGs" represents the extent of groundwater COC concentrations that exceed PRGs.

2. This area was developed using generally accepted hydrogeologic practices and is intended to depict inferred trends in subsurface conditions consistent with information gathered as part of the RI of the Site. Actual conditions would likely vary from those shown, and other interpretations are possible. Refer to Section 2 and text of Appendix C of this report for an explanation of the basis for this area.

3. Refer to Figures 2 through 22 of the Feasibility Study (FS) Report for additional notes and legend.

LEGEND:

SH-02D — GROUNDWATER MONITORING WELL LOCATION/ DESIGNATION

148 — GROUNDWATER ELEVATION CONTOUR SEPTEMBER 2006 (FEET ANSL)

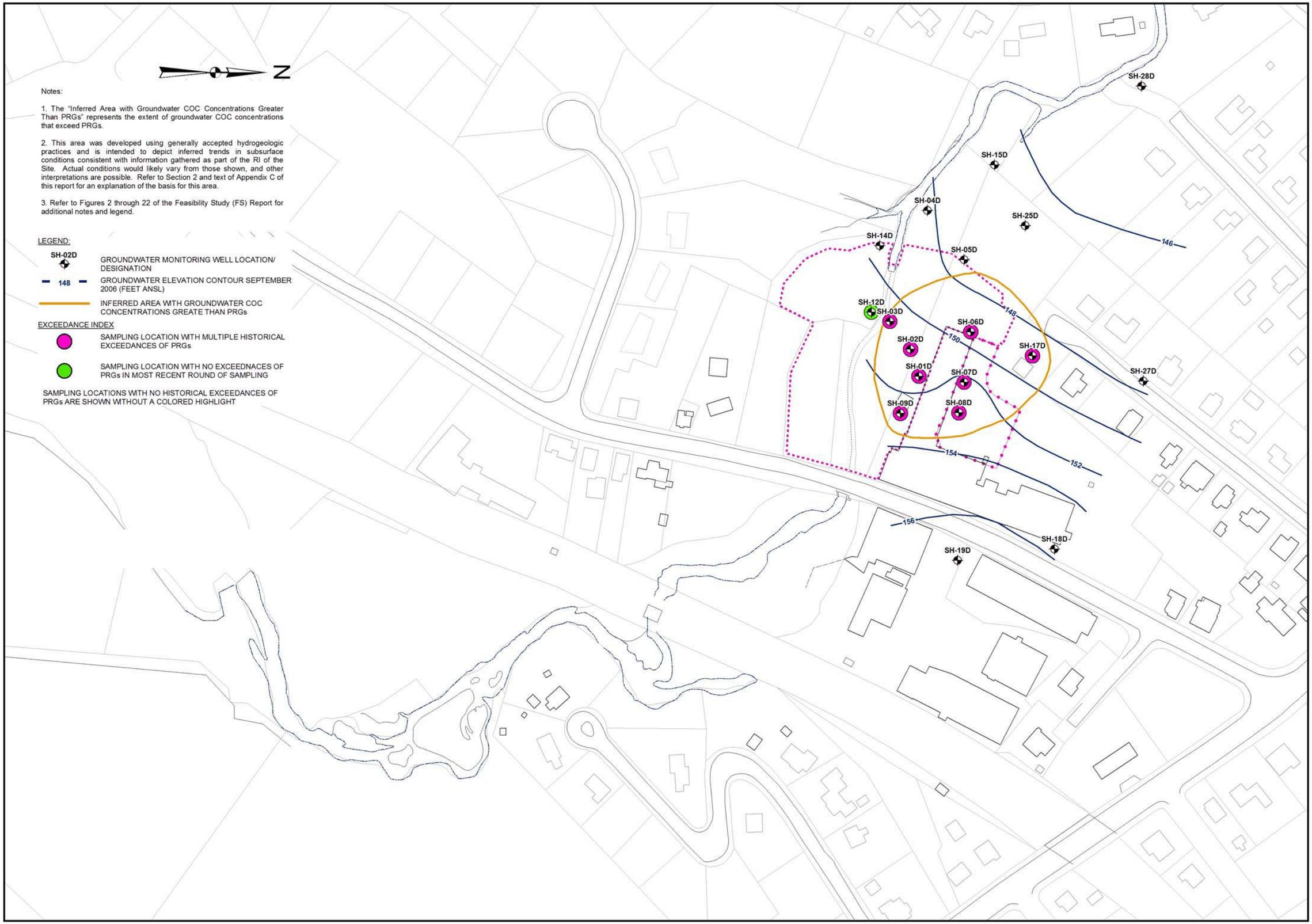
INFERRED AREA WITH GROUNDWATER COC CONCENTRATIONS GREATE THAN PRGs

EXCEEDANCE INDEX

SAMPLING LOCATION WITH MULTIPLE HISTORICAL EXCEEDANCES OF PRGs

SAMPLING LOCATION WITH NO EXCEEDNACES OF PRGs IN MOST RECENT ROUND OF SAMPLING

SAMPLING LOCATIONS WITH NO HISTORICAL EXCEEDANCES OF PRGs ARE SHOWN WITHOUT A COLORED HIGHLIGHT



NO	DATE	DESCRIPTION	BY

GRAPHICAL SCALE
Feet
240 160 80 0 80

FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

DEEP GROUNDWATER WITH COC CONCENTRATIONS GREATER THAN PRGS

PROJECT NUMBER
2032.01

FIGURE NUMBER
C-9

Locations With Exceedances of PRGs but Located Outside the Zone of Site-Related Contamination		
Location	**Representative of Background Conditions**	**Representative of Elevated Ambient Conditions**
SH-05R-A SH-05R-B		X
SH-19R	X	

Notes:

1. The "Inferred Area with Groundwater COC Concentrations Greater Than PRGs" represents the extent of groundwater and surface water COC concentrations that exceed PRGs.

2. This area was developed using generally accepted hydrogeologic practices and is intended to depict inferred trends in subsurface conditions consistent with information gathered as part of the RI of the Site. Actual conditions would likely vary from those shown, and other interpretations are possible. Refer to Section 2 and text of Appendix C of this report for an explanation of the basis for this area.

3. Refer to Figures 2 through 22 of the Feasibility Study (FS) Report for additional notes and legend.

LEGEND:

SH-05R — GROUNDWATER MONITORING WELL LOCATION/ DESIGNATION

148 — GROUNDWATER ELEVATION CONTOUR SEPTEMBER 2006 (FEET ANSL)

INFERRED AREA WITH GROUNDWATER COC CONCENTRATIONS GREATER THAN PRGs

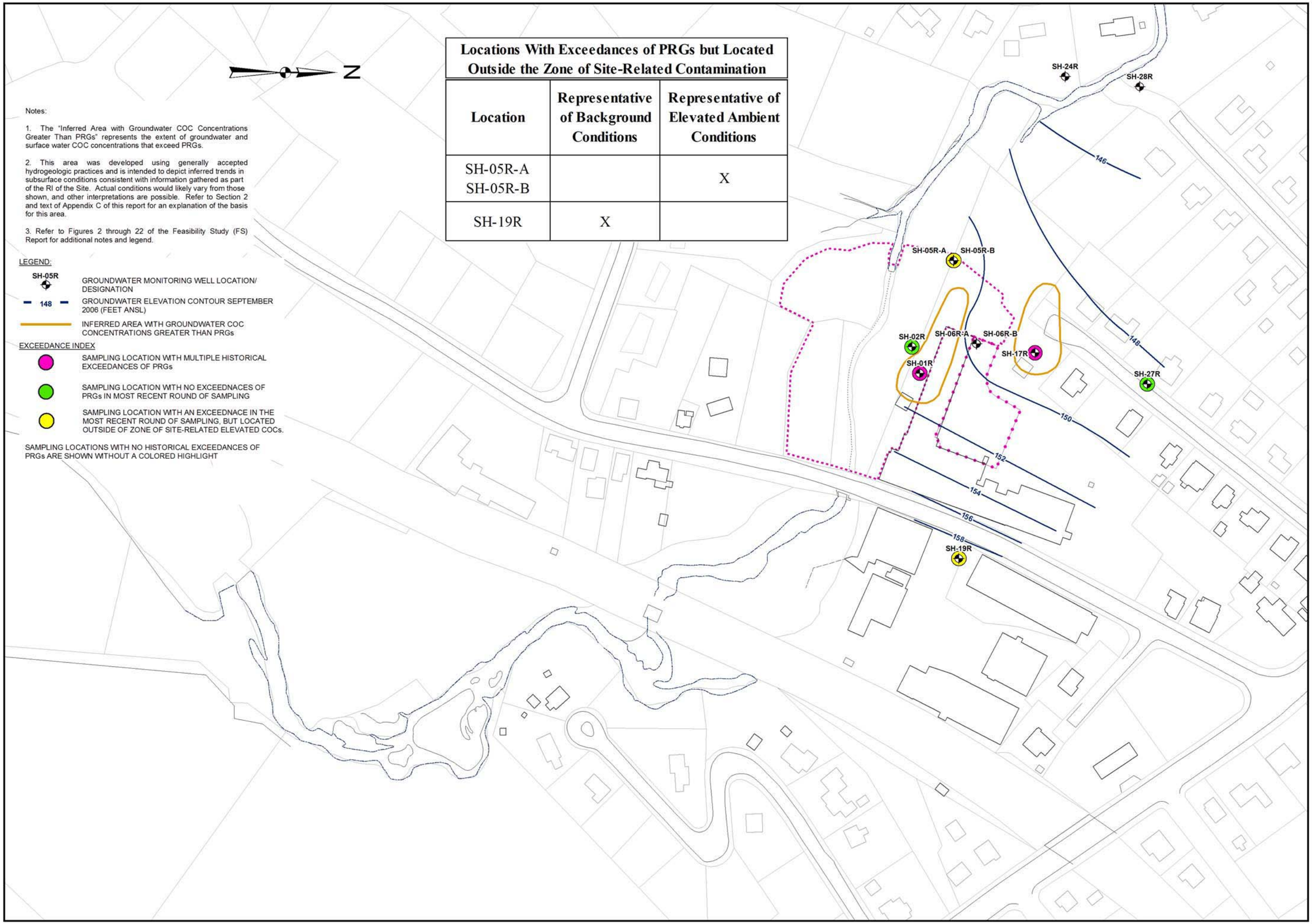
EXCEEDANCE INDEX

SAMPLING LOCATION WITH MULTIPLE HISTORICAL EXCEEDANCES OF PRGs

SAMPLING LOCATION WITH NO EXCEEDNACES OF PRGs IN MOST RECENT ROUND OF SAMPLING

SAMPLING LOCATION WITH AN EXCEEDNACE IN THE MOST RECENT ROUND OF SAMPLING, BUT LOCATED OUTSIDE OF ZONE OF SITE-RELATED ELEVATED COCs.

SAMPLING LOCATIONS WITH NO HISTORICAL EXCEEDANCES OF PRGs ARE SHOWN WITHOUT A COLORED HIGHLIGHT



GRAPHICAL SCALE
Feet
80 0 80 160 240

NO	DATE	DESCRIPTION	BY

FEASIBILITY STUDY REPORT
BLACKBURN & UNION PRIVILEGES SUPERFUND SITE
WALPOLE, MASSACHUSETTS

BEDROCK GROUNDWATER WITH COC CONCENTRATIONS GREATER THAN PRGS

PROJECT NUMBER
2032.01

FIGURE NUMBER
C-10

APPENDIX C-2

SUMMARY OF PREDICTED INFLUENT CONCENTRATIONS FOR ALTERNATIVE SW-3

APPENDIX C-2

SUMMARY OF PREDICTED INFLUENT CONCENTRATIONS FOR ALTERNATIVE SW-3

The purpose of this summary is to document the methodology SHA used to estimate contaminant concentrations anticipated to be present in the influent associated with a proposed groundwater treatment system. Water quality data from a subset of site monitoring wells were selected, based on the well's horizontal and vertical placement relative to the proposed location of the extraction trench, for this effort:

Shallow Aquifer: SH-04S, SH-05S, SH-06S, SH-16S
Deep Aquifer: SH-05D, SH-06D
Bedrock Aquifer: None

Summarized groundwater analytical results for the select monitoring wells included in the "Addendum to the Remedial Investigation Report, Phase 1 B-4/1B-5 Investigations," were used as a basis of this analysis. Several statistical reduction steps were then applied to the data:

1.) The select wells have generally been sampled between two and four times between 2001 and the present. For each analyzed constituent, the maximum, minimum, arithmetic mean, and most recent value were identified/calculated for each of the selected wells. *See Sample Calculation 1.*

2.) Each set of maximum, minimum, arithmetic mean, and most recent values for the four shallow wells were averaged (i.e., average maximum, average minimum, average arithmetic mean, and average most recent value for the four wells were calculated) resulting in a range of values estimated to be representative of shallow groundwater in the vicinity of the proposed trench. Similarly, the results of the two deep aquifer wells were averaged to provide a range of values expected to be representative of deep groundwater in the vicinity of the proposed trench. *See Sample Calculation 2.*

3.) Finally, the averaged shallow aquifer values were combined with the averaged deep aquifer values using an estimated ratio of 9:1 shallow water to deep water (based on an approximate order of magnitude difference in hydraulic conductivities of the aquifers). *See Sample Calculation 3.*

Please note, if a target analyte was not detected during a given monitoring event, a value equal to one-half the reporting limit was used in the calculation.

In addition, pH results were converted to equivalent [OH^-], for the statistical analysis/reduction described above, and then converted back to pH concentrations for the presentation of the results. *See Sample Calculation 4.*

The results of the analysis described above are summarized in Tables C-2.1, and presented in Tables C-2.2 through C-2.5.

Attachment: Sample Calculations

S:\CONDATA\2000s\2032.01\Originals\FS Report - Draft V1\Appendices\Appendix_C\C-2 GW Treatment System Influ Conc Calcs\App C-2.doc

Sample calculations used in estimating influent concentrations for preliminary groundwater treatment system design for the Blackburn and Union Privileges Superfund Site.

1. **Calculate/identify maximum, minimum, arithmetic mean, and most recent concentrations of target analyte for select monitoring well.**

As example, use benzene and SH-04S:

Given:

SH-04S	2001	2002	2003	2006
Benzene (ppb)	43	17	17	12

Calculation:

Maximum Benzene Concentration: $Maximum(43,17,17,12)$ = 43 ppb
Minimum Benzene Concentration: $Minimum(43,17,17,12)$ = 12 ppb
Most Recent Benzene Concentration: Most Recent Year = 2006; therefore, 12 ppb
Mean Benzene Concentration: $\left(\frac{43+17+17+12}{4}\right)$ = 22.3 ppb

Note: If target analyte was not detected, a value equal to one-half the reporting limit was used in the calculation.

2. **Calculate average of maximum, minimum, arithmetic mean, and most recent concentrations of target analyte for select monitoring wells.**

As example, use benzene and shallow aquifer monitoring wells:

Given:

Benzene (ppb)	Max	Min	Most Recent	Mean
SH-04S	43	12	12	22.3
SH-05S	12	2	5	6.6
SH-06S	4.6	2.6	2.6	3.7
SH-16S	0.1	0.1	0.075	0.1

Calculations:

Average of Max Benzene Concentrations: $\left(\frac{43+12+4.6+0.1}{4}\right)$ = 14.9 ppb

Average of Min Benzene Concentrations: $\left(\frac{12+2+2.6+0.1}{4}\right)$ = 4.2 ppb

Average of Most Recent Benzene Concentrations: $\left(\frac{12+5+2.6+0.075}{4}\right)$ = 4.9 ppb

Average of Mean Benzene Concentrations: $\left(\frac{22.3+6.6+3.7+0.1}{4}\right)$ = 8.2 ppb

3. Calculate estimated maximum and minimum influent concentrations, an estimated influent concentration based on most recent data, and an estimated average influent concentration.

As example, use benzene:

<u>Given:</u>

Benzene (ppb)	Ave Max	Ave Min	Ave Most Recent	Ave Mean
Shallow Aquifer Wells	14.9	4.2	4.9	8.2
Deep Aquifer Wells	3.1	1.5	3.1	2.1

Estimated Maximum Benzene Influent Concentration: $((14.9*0.9)+(3.1*0.1))$ = 13.7 ppb
Estimated Minimum Benzene Influent Concentration: $((4.2*0.9)+(1.5*0.1))$ = 3.9 ppb
Estimated Benzene Influent Concentration based on most recent data:
$((4.9*0.9)+(3.1*0.1))$ = 4.7 ppb
Estimated Average Benzene Influent Concentration: $((8.2*0.9)+(2.1*0.1))$ = 7.6 ppb

4. Calculate [OH$^-$] to be used instead of pH values in statistical reduction steps described above.

As example, use 2001 pH data for well SH-04S:

<u>Given:</u>

pH = -log[H$^+$]

K_w = [H$^+$]*[OH$^-$] or [H$^+$] = $\left(\frac{Kw}{[OH-]}\right)$

$K_w = 1.01 \times 10^{-14}$

Covert pH to [OH$^-$]:

$$\text{pH} = -\log[H^+]$$

$$= -\log\left(\frac{K_w}{[OH^-]}\right)$$

$$= -\log\left(\frac{1.01x10^{-14}}{[OH^-]}\right)\text{; then solve for [0H}^-\text{]}$$

$$[OH^-] = \left(\frac{1.01x10^{-14}}{10^{-pH}}\right) = \left(\frac{1.01x10^{-14}}{10^{-11.9}}\right) = 0.008\text{ M}$$

TABLE C-2.1
Summary of Estimated Influent Concentrations
Compared to RGP Effluent Criteria
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	RGP Effluent Criteria	Concentrations in µg/l (unless otherwise noted)			
		Estimated Influent Concentration			
		Maximum	Minimum	Most Recent	Mean
AVOCs					
Benzene $	5	13.7	3.9	4.7	7.6
Total BTEX	100	82.4	22.7	35.0	48.3
CVOCs					
Carbon tetrachloride $	4.4	2.88	0.85	2.83	1.58
Dichloroethane (1,1-)	70	5.3	3.9	3.9	4.3
Dichloroethane (1,2-) $	5.0	2.54	0.20	2.39	0.94
Dichloroethene (1,1-)	3.2	2.70	0.39	2.49	1.09
Dichloroethene (cis-1,2-)	70	5.3	3.9	3.9	4.3
Methylene chloride	4.6	3.40	0.47	3.40	1.82
Tetrachloroethene $	5.0	2.60	0.30	2.43	0.99
Trichloroethane (1,1,1-)	200	5.3	3.9	3.9	4.3
Trichloroethane (1,1,2-) $	5.0	2.54	0.23	2.39	0.96
Trichloroethene $	5.0	2.65	0.45	2.50	1.11
Vinyl chloride $	2.0	3.00	0.62	2.56	1.61
Other VOCs					
Acetone	Monitor	33	12	13	19
Methyl-tert Butyl Ether	70.0	5.28	3.90	3.90	4.26
PAHs					
Acenaphthene	Group II	8.2	3.3	4.1	5.3
Acenaphthylene	Group II	3.2	1.0	1.3	2.0
Anthracene	Group II	2.0	0.7	0.9	1.2
Benzo(a)anthracene	0.0038 & Group I	0.3864	0.1241	0.1708	0.2603
Benzo(a)pyrene	0.0038 & Group I	0.2548	0.0651	0.1032	0.1537
Benzo(b)fluoranthene	0.0038 & Group I	0.2234	0.0605	0.0697	0.1275
Benzo(g,h,i)perylene	Group II	0.2	0.0	0.1	0.1
Benzo(k)fluoranthene	0.0038 & Group I	0.2178	0.0439	0.0658	0.1196
Chrysene	0.0038 & Group I	0.3666	0.1240	0.1717	0.2444
Dibenz(a,h)anthracene	0.0038 & Group I	0.0472	0.0060	0.0105	0.0220
Fluoranthene	Group II	1.6	0.5	0.8	1.0
Fluorene	Group II	5.6	2.5	3.6	4.0
Indeno(1,2,3-cd)pyrene	0.0038 & Group I	0.2178	0.0332	0.0571	0.1098
Naphthalene	20 & Group II	101.6	33.4	41.0	65.3
Phenanthrene	Group II	12.7	4.6	6.7	8.1
Pyrene	Group II	2.1	0.6	1.1	1.3
Group I PAHs	10.0	1.49	0.19	0.70	0.82
Group II PAHs	100	189.8530	67.7310	86.8378	123.0719
Other SVOCs					
bis(2-Ethylhexyl)phthalate	6.0	4.68	0.46	0.70	1.99
Dichlorobenzene (1,2-)	600	4.0	1.0	1.1	2.5
Dichlorobenzene (1,3-)	320	1.3	0.4	0.5	0.8
Dichlorobenzene (1,4-)	5.0	1.28	0.39	0.49	0.83
Pentachlorophenol	1.0	1.28	0.39	0.49	0.83
Total Phenols	300	8.3	5.2	6.8	6.7

TABLE C-2.1
Summary of Estimated Influent Concentrations
Compared to RGP Effluent Criteria
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	RGP Effluent Criteria	Concentrations in µg/l (unless otherwise noted)			
		Estimated Influent Concentration			
		Maximum	Minimum	Most Recent	Mean
Metals					
Antimony	5.60	6.273	2.184	2.867	3.659
Arsenic	10.00	67.105	33.121	48.970	47.130
Cadmium	0.20	0.648	0.096	0.398	0.382
Chromium†	48.8/11.4	11.28	3.65	4.76	6.87
Copper‡	5.2	41.52	11.62	20.63	24.48
Iron	1,000	3207.5	907.9	1518.0	1837.5
Lead‡	1.3	138.47	35.03	40.07	74.95
Mercury	0.9	0.12	0.10	0.10	0.11
Nickel	29	36.8	10.6	20.4	23.6
Selenium	5	2.8	1.2	1.7	1.9
Silver	1.2	0.65	0.10	0.39	0.38
Zinc	66.6	39.44	12.34	13.83	23.44
Cyanide (weak acid dissociable)*	5.2	2.50	2.50	2.50	2.50
pH (S.U.)		12.0	11.3	11.8	11.7

Mean value exceeds RGP Effluent Criteria
Max value exceeds RGP Effluent Criteria
Underlined value exceeds RGP Effluent Criteria

Notes:

1. "RGP Effluent Criteria" indicates values listed are from the USEPA Remediation & Miscellaneous Contaminated Sites General Permit (RGP) Appendix III - Effluent Limitations, September 2005.

2. Only those analytes regulated by the RGP for which laboratory analytical data are available are presented in this table. Laboratory analytical data are not available for all RGP-regulated compounds.

3. Refer to the notes for Tables C-2.2 through C-2.5 for additional notes.

TABLE C-2.2
Summary of Groundwater Data - Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Concentrations in µg/l																							
	COPC Screening Levels			RGP Effluent Criteria	SH-04S																			
					9/11/2001				5/20/2002				10/28/2003				10/4/2006				SH-04S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
AVOCs																								
Benzene $	5	**0.35**	*5*	5	***43***			***43***	***17***	J		***17***	***17***			***17***	***12***	J	L	***12***	43	12	12	22.3
Toluene	1,000	**72**	*150*	Total BTEX	57			57	22			22	23			23	11	J	L	11	57	11	11	28.3
Ethylbenzene	700	**130**	*700*	Total BTEX	23			23	20	U		10	9.2	J	I	9.2	5.0	J	I	5.0	23.0	5	5	11.8
Xylene (m,p-) †	10,000	**21**	*2,200*	Total BTEX	**33**			**33**	11	J		11	13			13	20	UJ	L	10	33	10	10	16.8
Xylene (o-) †	10,000	**21**	*3,300*	Total BTEX	17			17	20	U		10	7.0	J	I	7.0	10	UJ	L	5	17	5	5	9.8
Styrene	100	**160**	*890*	NS	13			13	20	U		10	6.2	J	I	6.2	10	UJ	L	5	13	5	5	8.6
Total BTEX	NS	NS	NS	100	173			173	50			50	69.2			69.2	28			28	173	28	28	80.1
Total AVOCs	NS	NS	NS	NS	186			186	50			50	75.4			75.4	28			28	186	28	28	84.9
CVOCs																								
Carbon tetrachloride $	5	**0.17**	*5*	4.4	2.2	UJ		1.1	5.3	UJ		2.7	3.6	UJ		1.8	10	UJ	L	5	5.0	1.1	5	2.6
Chlorobenzene	100	**11**	*39*	NS	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Chloroethane	NS	**4.6**	*2,800*	NS	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Chloroform $	NS	**0.17**	*80*	NS	28	U		14	2.7	UJ		1.4	0.70	UJ		0.35	10	UJ	L	5	14	0.35	5	5.2
Chloromethane	NS	**16**	*6.7*	NS	2.8	UJ		1.4	2.9	UJ		1.5	4.0	UJ		2.0	10	UJ	L	5	5	1.4	5	2.5
Dichloroethane (1,1-)	NS	**81**	*220*	70	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Dichloroethane (1,2-) $	5	**0.12**	*5*	5.0	0.90	UJ		0.45	2.9	UJ		1.5	0.50	UJ		0.25	10	UJ	L	5	5	0.25	5	1.8
Dichloroethene (1,1-)	7	**34**	*19*	3.2	2.2	UJ		1.1	1.9	UJ		1.0	1.1	UJ		0.6	10	UJ	L	5	5	0.55	5	1.9
Dichloroethene (cis-1,2-)	70	**6.1**	*21*	70	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Dichloroethene (trans-1,2-)	100	**12**	*18*	NS	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Dichloropropane (1,2-)	5	**0.16**	*3.5*	NS	0.75	UJ		0.38	2.4	UJ		1.2	0.85	UJ		0.43	10	UJ	L	5	5	0.38	5	1.8
Dichloropropene (cis-1,3-) ‡	NS	**0.40**	*0.84*	NS	1.2	UJ		0.6	2.2	UJ		1.1	1.0	UJ		0.5	10	UJ	L	5	5	0.5	5	1.8
Dichloropropene (trans-1,3-) ‡	NS	**0.40**	*0.84*	NS	1.0	UJ		0.5	2.3	UJ		1.2	0.55	UJ		0.28	10	UJ	L	5	5	0.28	5	1.7
Methylene chloride	5	**4.3**	*58*	4.6	1.4	UJ		0.7	6.6	UJ		3.3	7.8	UJ		3.9	10	UJ	L	5	5	0.7	5	3.2
Tetrachloroethane (1,1,2,2-)	NS	**0.055**	*3*	NS	0.80	UJ		0.40		R			1.6	UJ		0.8	10	UJ	L	5	5	0.4	5	2.1
Tetrachloroethene $	5	**0.1**	*5*	5.0	1.6	UJ		0.8	2.1	UJ		1.1	0.75	UJ		0.38	10	UJ	L	5	5	0.38	5	1.8
Trichloroethane (1,1,1-)	200	**320**	*310*	200	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Trichloroethane (1,1,2-) $	5	**0.20**	*5*	5.0	1.3	UJ		0.7	2.4	UJ		1.2	0.60	UJ		0.30	10	UJ	L	5	5	0.3	5	1.8
Trichloroethene $	5	**0.028**	*5*	5.0	1.3	UJ		0.7	2.6	UJ		1.3	0.90	UJ		0.45	10	UJ	L	5	5	0.45	5	1.9
Vinyl chloride $	2	**0.020**	*2*	2.0	3.8	UJ		1.9	5.8	UJ		2.9	1.6	UJ		0.8	10	UJ	L	5	5	0.8	5	2.7
Total CVOCs	NS	NS	NS	NS	-			-	-			-	-			-	-			-	-	-	-	-
Other VOCs																								
Acetone	NS	**550**	*22,000*	Monitor	100	UJ	L	50	50	U		25	25	U		12.5	25	UJ	I	12.5	50	12.5	12.5	25.0
Bromochloromethane	NS	NS	NS	NS	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Bromodichloromethane	NS	**0.18**	*2.1*	NS	9.2	UJ		4.6	2.2	UJ		1.1	1.2	UJ		0.6	10	UJ	L	5	5	0.6	5	2.8
Bromoform	NS	**8.5**	*0.0083*	NS	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Bromomethane	NS	**0.87**	*2.0*	NS	5.4	UJ	I	2.7	2.1	UJ	I	1.1	7.7	UJ	I	3.9	10	UJ	I	5	5	1.1	5	3.2
Butanone (2-)	NS	**700**	*44,000*	NS	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Carbon disulfide	NS	**100**	*56*	NS	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Chloroethylvinyl ether (2-)	NS	NS	NS	NS		R			20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Dibromochloromethane	NS	**0.13**	*3.2*	NS	2.7	UJ		1.4	2.0	UJ		1.0	0.75	UJ		0.38	10	UJ	I	5	5	0.38	5	1.9
Hexanone (2-)	NS	NS	NS	NS	18			18	20	U		10	8.0	J	I	8.0	10	UJ	L	5	18	5	5	10.3
Methyl-2-pentanone (4-)	NS	**200**	*1,400*	NS	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Methyl-tert Butyl Ether	NS	**11**	*12,000*	70.0	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Trichlorofluoromethane	NS	**130**	*18*	NS	10	U		5	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.3
Vinyl acetate	NS	**41**	*960*	NS	25	UJ	L	12.5		R			10	U		5	10	UJ	I	5	12.5	5	5	7.5
Total Other VOCs	NS	NS	NS	NS	18			18	-			-	8.0			8.0	-			-	18	8	-	13.0
Total VOCs	NS	NS	NS	NS	204			204	50			50	83.4			83.4	28			28	204	28	28	91.4

TABLE C-2.2
Summary of Groundwater Data - Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l																			
					SH-05S																			
					9/11/2001				5/21/2002				10/29/2003				10/4/2006				SH-05S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
AVOCs																								
Benzene $	5	**0.35**	*5*	5	***7.4***	J		***7.4***	***12***			***12***	**2.0**	J	I	**2.0**	10	U		5	12.0	2	5	6.6
Toluene	1,000	**72**	*150*	Total BTEX	7.0	J		7.0	6.6	J		6.6	10	U		5	10	U		5	7	5	5	5.9
Ethylbenzene	700	**130**	*700*	Total BTEX	5.0	J		5.0	10	U		5	10	U		5	10	U		5	5.0	5.0	5	5.0
Xylene (m,p-) †	10,000	**21**	*2,200*	Total BTEX	11			11	12			12	10	U		5	20	U		10	12	5	10	9.5
Xylene (o-) †	10,000	**21**	*3,300*	Total BTEX	7.2	J		7.2	7.4	J		7.4	10	U		5	10	U		5	7.4	5	5	6.2
Styrene	100	**160**	*890*	NS	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Total BTEX	NS	NS	NS	100	37.6			37.6	38			38	2.0			2.0	-			-	38	2	-	25.9
Total AVOCs	NS	NS	NS	NS	37.6			37.6	38			38	2.0			2.0	-			-	38	2	-	25.9
CVOCs																								
Carbon tetrachloride $	5	**0.17**	*5*	4.4	2.2	UJ		1.1	2.6	UJ		1.3	3.6	UJ		1.8	10	U		5	5.0	1.1	5	2.3
Chlorobenzene	100	**11**	*39*	NS	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Chloroethane	NS	**4.6**	*2,800*	NS	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Chloroform $	NS	**0.17**	*80*	NS	27	U		13.5	1.4	UJ		0.7	0.70	UJ		0.35	10	U		5	13.5	0.35	5	4.9
Chloromethane	NS	**16**	*6.7*	NS	2.8	UJ		1.4	1.4	UJ		0.7	4.0	UJ		2.0	10	U		5	5	0.7	5	2.3
Dichloroethane (1,1-)	NS	**81**	*220*	70	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Dichloroethane (1,2-) $	5	**0.12**	*5*	5.0	0.90	UJ		0.45	1.4	UJ		0.7	0.50	UJ		0.25	10	U		5	5	0.25	5	1.6
Dichloroethene (1,1-)	7	**34**	*19*	3.2	2.2	UJ		1.1	0.95	UJ		0.48	1.1	UJ		0.6	10	U		5	5	0.48	5	1.8
Dichloroethene (cis-1,2-)	70	**6.1**	*21*	70	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Dichloroethene (trans-1,2-)	100	**12**	*18*	NS	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Dichloropropane (1,2-)	5	**0.16**	*3.5*	NS	0.75	UJ		0.38	1.2	UJ		0.6	0.85	UJ		0.43	10	U		5	5	0.38	5	1.6
Dichloropropene (cis-1,3-) ‡	NS	**0.40**	*0.84*	NS	1.2	UJ		0.6	1.1	UJ		0.6	1.0	UJ		0.5	10	U		5	5	0.5	5	1.7
Dichloropropene (trans-1,3-) ‡	NS	**0.40**	*0.84*	NS	1.0	UJ		0.5	1.2	UJ		0.6	0.55	UJ		0.28	10	U		5	5	0.28	5	1.6
Methylene chloride	5	**4.3**	*58*	4.6	1.4	UJ		0.7	1.0	UJ		0.5	7.8	UJ		3.9	10	U		5	5	0.5	5	2.5
Tetrachloroethane (1,1,2,2-)	NS	**0.055**	*3*	NS	0.80	UJ		0.40	0.60	UJ		0.30	1.6	UJ		0.8	10	U		5	5	0.3	5	1.6
Tetrachloroethene $	5	**0.1**	*5*	5.0	1.6	UJ		0.8	1.0	UJ		0.5	0.75	UJ		0.38	10	U		5	5	0.38	5	1.7
Trichloroethane (1,1,1-)	200	**320**	*310*	200	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Trichloroethane (1,1,2-) $	5	**0.20**	*5*	5.0	1.3	UJ		0.7	1.2	UJ		0.6	0.60	UJ		0.30	10	U		5	5	0.3	5	1.6
Trichloroethene $	5	**0.028**	*5*	5.0	1.3	UJ		0.7	1.3	UJ		0.7	0.90	UJ		0.45	10	U		5	5	0.45	5	1.7
Vinyl chloride $	2	**0.020**	*2*	2.0	3.8	UJ		1.9	2.9	UJ		1.5	1.6	UJ		0.8	10	U		5	5	0.8	5	2.3
Total CVOCs	NS	NS	NS	NS	-			-	-			-	-			-	-			-	-	-	-	-
Other VOCs																								
Acetone	NS	**550**	*22,000*	Monitor	100	UJ	L	50	25	J		25	25	U		12.5	25	U		12.5	50	12.5	12.5	25.0
Bromochloromethane	NS	NS	NS	NS	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Bromodichloromethane	NS	**0.18**	*2.1*	NS	9.0	UJ		4.5	1.1	UJ		0.6	1.2	UJ		0.6	10	U		5	5	0.55	5	2.7
Bromoform	NS	**8.5**	*0.0083*	NS	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Bromomethane	NS	**0.87**	*2.0*	NS	5.4	UJ	I	2.7	0.80	UJ		0.40	7.7	UJ	I	3.9	10	UJ	I	5	5	0.4	5	3.0
Butanone (2-)	NS	**700**	*44,000*	NS	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Carbon disulfide	NS	**100**	*56*	NS	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Chloroethylvinyl ether (2-)	NS	NS	NS	NS		R			10	U		5	10	U		5	10	U		5	5	5	5	5.0
Dibromochloromethane	NS	**0.13**	*3.2*	NS	2.8	UJ		1.4	1.0	UJ		0.5	0.75	UJ		0.38	10	UJ	I	5	5	0.38	5	1.8
Hexanone (2-)	NS	NS	NS	NS	10	U		5	25	U		12.5	25	U		12.5	10	U		5	12.5	5	5	8.8
Methyl-2-pentanone (4-)	NS	**200**	*1,400*	NS	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Methyl-tert Butyl Ether	NS	**11**	*12,000*	70.0	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Trichlorofluoromethane	NS	**130**	*18*	NS	10	U		5	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Vinyl acetate	NS	**41**	*960*	NS	25	UJ	L	12.5	10	U		5	10	U		5	10	U		5	12.5	5	5	6.9
Total Other VOCs	NS	NS	NS	NS	-			-	25			25	-			-	-			-	25	25	-	25.0
Total VOCs	NS	NS	NS	NS	37.6			37.6	63			63	2.0			2.0	-			-	63	2	-	34.2

TABLE C-2.2
Summary of Groundwater Data - Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Concentrations in µg/l																			
	COPC Screening Levels			RGP Effluent Criteria	SH-06S															
					9/6/2001				5/22/2002				10/29/2003				SH-06S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
AVOCs																				
Benzene $	5	**0.35**	*5*	5	**3.8**	J		**3.8**	**4.6**	J		**4.6**	**2.6**	J	I	**2.6**	4.6	2.6	2.6	3.7
Toluene	1,000	**72**	*150*	Total BTEX	6.6	J		6.6	5.3	J		5.3	5.2	J	I	5.2	6.6	5.2	5.2	5.7
Ethylbenzene	700	**130**	*700*	Total BTEX	10	U		5	10	U		5	10	U		5	5.0	5	5	5.0
Xylene (m,p-) †	10,000	**21**	*2,200*	Total BTEX	5.2	J		5.2	10	U		5	8.2	J	I	8.2	8.2	5	8.2	6.1
Xylene (o-) †	10,000	**21**	*3,300*	Total BTEX	10	U		5	10	U		5	5.9	J	I	5.9	5.9	5	5.9	5.3
Styrene	100	**160**	*890*	NS	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Total BTEX	NS	NS	NS	100	15.6			15.6	9.9			9.9	21.9			21.9	21.9	9.9	21.9	15.8
Total AVOCs	NS	NS	NS	NS	15.6			15.6	9.9			9.9	21.9			21.9	21.9	9.9	21.9	15.8
CVOCs																				
Carbon tetrachloride $	5	**0.17**	*5*	4.4	2.2	UJ		1.1	2.6	UJ		1.3	3.6	UJ		1.8	1.8	1.1	1.8	1.4
Chlorobenzene	100	**11**	*39*	NS	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Chloroethane	NS	**4.6**	*2,800*	NS	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Chloroform $	NS	**0.17**	*80*	NS	1.9	UJ		1.0	1.4	UJ		0.7	0.70	UJ		0.35	0.95	0.35	0.35	0.7
Chloromethane	NS	**16**	*6.7*	NS	2.8	UJ		1.4	1.4	UJ		0.7	4.0	UJ		2.0	2	0.7	2	1.4
Dichloroethane (1,1-)	NS	**81**	*220*	70	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Dichloroethane (1,2-) $	5	**0.12**	*5*	5.0	0.90	UJ		0.45	1.4	UJ		0.7	0.50	UJ		0.25	0.7	0.25	0.25	0.5
Dichloroethene (1,1-)	7	**34**	*19*	3.2	2.2	UJ		1.1	0.95	UJ		0.48	1.1	UJ		0.6	1.1	0.48	0.55	0.7
Dichloroethene (cis-1,2-)	70	**6.1**	*21*	70	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Dichloroethene (trans-1,2-)	100	**12**	*18*	NS	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Dichloropropane (1,2-)	5	**0.16**	*3.5*	NS	0.75	UJ		0.38	1.2	UJ		0.6	0.85	UJ		0.43	0.6	0.38	0.43	0.5
Dichloropropene (cis-1,3-) ‡	NS	**0.40**	*0.84*	NS	1.2	UJ		0.6	1.1	UJ		0.6	1.0	UJ		0.5	0.6	0.5	0.5	0.6
Dichloropropene (trans-1,3-) ‡	NS	**0.40**	*0.84*	NS	1.0	UJ		0.5	1.2	UJ		0.6	0.55	UJ		0.28	0.6	0.28	0.28	0.5
Methylene chloride	5	**4.3**	*58*	4.6	1.2	UJ		0.6	1.0	UJ		0.5	7.8	UJ		3.9	3.9	0.5	3.9	1.7
Tetrachloroethane (1,1,2,2-)	NS	**0.055**	*3*	NS	0.80	UJ		0.40	0.60	UJ		0.30	1.6	UJ		0.8	0.8	0.3	0.8	0.5
Tetrachloroethene $	5	**0.1**	*5*	5.0	1.6	UJ		0.8	1.0	UJ		0.5	0.75	UJ		0.38	0.8	0.38	0.38	0.6
Trichloroethane (1,1,1-)	200	**320**	*310*	200	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Trichloroethane (1,1,2-) $	5	**0.20**	*5*	5.0	1.3	UJ		0.7	1.2	UJ		0.6	0.60	UJ		0.30	0.65	0.3	0.3	0.5
Trichloroethene $	5	**0.028**	*5*	5.0	1.3	UJ		0.7	1.3	UJ		0.7	0.90	UJ		0.45	0.65	0.45	0.45	0.6
Vinyl chloride $	2	**0.020**	*2*	2.0	3.8	UJ		1.9	2.9	UJ		1.5	1.6	UJ		0.8	1.9	0.8	0.8	1.4
Total CVOCs	NS	NS	NS	NS	-			-	-			-	-			-	-	-	-	-
Other VOCs																				
Acetone	NS	**550**	*22,000*	Monitor	25	UJ	I	12.5	14	J		14	25	U		12.5	14	12.5	12.5	13.0
Bromochloromethane	NS	NS	NS	NS	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Bromodichloromethane	NS	**0.18**	*2.1*	NS	1.2	UJ		0.6	1.1	UJ		0.6	1.2	UJ		0.6	0.6	0.55	0.6	0.6
Bromoform	NS	**8.5**	*0.0083*	NS	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Bromomethane	NS	**0.87**	*2.0*	NS	5.4	UJ	I	2.7	3.2	UJ	I	1.6	7.7	UJ	I	3.9	3.85	1.6	3.85	2.7
Butanone (2-)	NS	**700**	*44,000*	NS	10	U		5	6.4	J		6.4	10	U		5	6.4	5	5	5.5
Carbon disulfide	NS	**100**	*56*	NS	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Chloroethylvinyl ether (2-)	NS	NS	NS	NS	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Dibromochloromethane	NS	**0.13**	*3.2*	NS	0.75	UJ		0.38	1.0	UJ		0.5	0.75	UJ		0.38	0.5	0.38	0.38	0.4
Hexanone (2-)	NS	NS	NS	NS	10	U		5	10	U		5	25	U		12.5	12.5	5	12.5	7.5
Methyl-2-pentanone (4-)	NS	**200**	*1,400*	NS	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Methyl-tert Butyl Ether	NS	**11**	*12,000*	70.0	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Trichlorofluoromethane	NS	**130**	*18*	NS	10	U		5	10	U		5	10	U		5	5	5	5	5.0
Vinyl acetate	NS	**41**	*960*	NS	25	UJ	L	12.5	10	U		5	10	U		5	12.5	5	5	7.5
Total Other VOCs	NS	NS	NS	NS	-			-	20.4			20.4	-			-	20.4	20.4	-	20.4
Total VOCs	NS	NS	NS	NS	15.6			15.6	30.3			30.3	21.9			21.9	30.3	15.6	21.9	22.6

TABLE C-2.2
Summary of Groundwater Data - Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l															
					SH-16S															
					9/11/2001				5/17/2002				11/19/2003			SH-16S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Maximum	Minimum	Most Recent	Mean
AVOCs																				
Benzene $	5	**0.35**	*5*	5	0.25	UJ		0.13	0.22	UJ		0.11	0.15	UJ		0.08	0.1	0.1	0.075	0.1
Toluene	1,000	**72**	*150*	Total BTEX	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Ethylbenzene	700	**130**	*700*	Total BTEX	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1.0	1	1	1.0
Xylene (m,p-) †	10,000	**21**	*2,200*	Total BTEX	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Xylene (o-) †	10,000	**21**	*3,300*	Total BTEX	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Styrene	100	**160**	*890*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Total BTEX	NS	NS	NS	100	-			-	-			-	-			-	-	-	-	-
Total AVOCs	NS	NS	NS	NS	-			-	-			-	-			-	-	-	-	-
CVOCs																				
Carbon tetrachloride $	5	**0.17**	*5*	4.4	0.45	UJ		0.23	0.53	UJ		0.27	0.33	UJ		0.17	0.3	0.2	0.165	0.2
Chlorobenzene	100	**11**	*39*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Chloroethane	NS	**4.6**	*2,800*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Chloroform $	NS	**0.17**	*80*	NS	0.28	UJ		0.14	0.27	UJ		0.14	0.11	UJ		0.06	0.14	0.055	0.055	0.1
Chloromethane	NS	**16**	*6.7*	NS	0.57	UJ		0.29	0.29	UJ		0.15	0.20	UJ		0.10	0.29	0.1	0.1	0.2
Dichloroethane (1,1-)	NS	**81**	*220*	70	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Dichloroethane (1,2-) $	5	**0.12**	*5*	5.0	0.18	UJ		0.09	0.29	UJ		0.15	0.17	UJ		0.09	0.15	0.085	0.085	0.1
Dichloroethene (1,1-)	7	**34**	*19*	3.2	0.43	UJ		0.22	0.19	UJ		0.10	0.30	UJ		0.15	0.22	0.095	0.15	0.2
Dichloroethene (cis-1,2-)	70	**6.1**	*21*	70	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Dichloroethene (trans-1,2-)	100	**12**	*18*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Dichloropropane (1,2-)	5	**0.16**	*3.5*	NS	0.15	UJ		0.08	0.24	UJ		0.12	0.14	UJ		0.07	0.12	0.07	0.07	0.1
Dichloropropene (cis-1,3-) ‡	NS	**0.40**	*0.84*	NS	0.23	UJ		0.12	0.22	UJ		0.11	0.14	UJ		0.07	0.12	0.07	0.07	0.1
Dichloropropene (trans-1,3-) ‡	NS	**0.40**	*0.84*	NS	0.21	UJ		0.11	0.23	UJ		0.12	0.10	UJ		0.05	0.12	0.05	0.05	0.1
Methylene chloride	5	**4.3**	*58*	4.6	0.20	UJ		0.10	0.21	UJ		0.11	0.25	UJ		0.13	0.13	0.1	0.13	0.1
Tetrachloroethane (1,1,2,2-)	NS	**0.055**	*3*	NS	0.16	UJ		0.08	0.12	UJ		0.06	0.090	UJ		0.045	0.08	0.045	0.045	0.1
Tetrachloroethene $	5	**0.1**	*5*	5.0	0.32	UJ		0.16	0.21	UJ		0.11	0.23	UJ		0.12	0.16	0.11	0.12	0.1
Trichloroethane (1,1,1-)	200	**320**	*310*	200	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Trichloroethane (1,1,2-) $	5	**0.20**	*5*	5.0	0.26	UJ		0.13	0.24	UJ		0.12	0.10	UJ		0.05	0.13	0.05	0.05	0.1
Trichloroethene $	5	**0.028**	*5*	5.0	0.26	UJ		0.13	0.26	UJ		0.13	0.18	UJ		0.09	0.13	0.09	0.09	0.1
Vinyl chloride $	2	**0.020**	*2*	2.0	0.75	UJ		0.38	0.58	UJ		0.29	0.32	UJ		0.16	0.375	0.16	0.16	0.3
Total CVOCs	NS	NS	NS	NS	-			-	-			-	-			-	-	-	-	-
Other VOCs																				
Acetone	NS	**550**	*22,000*	Monitor	20	UJ	L	10	5.0	U		2.5	5.0	U		2.5	10	2.5	2.5	5.0
Bromochloromethane	NS	NS	NS	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Bromodichloromethane	NS	**0.18**	*2.1*	NS	0.23	UJ		0.12	0.22	UJ		0.11	0.060	UJ		0.030	0.12	0.03	0.03	0.1
Bromoform	NS	**8.5**	*0.0083*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Bromomethane	NS	**0.87**	*2.0*	NS	1.1	UJ	I	0.6	0.16	UJ	I	0.08	0.78	UJ	I	0.39	0.55	0.1	0.39	0.3
Butanone (2-)	NS	**700**	*44,000*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Carbon disulfide	NS	**100**	*56*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Chloroethylvinyl ether (2-)	NS	NS	NS	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Dibromochloromethane	NS	**0.13**	*3.2*	NS	0.15	UJ		0.08	0.20	UJ		0.10	0.090	UJ		0.045	0.1	0.045	0.045	0.1
Hexanone (2-)	NS	NS	NS	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Methyl-2-pentanone (4-)	NS	**200**	*1,400*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Methyl-tert Butyl Ether	NS	**11**	*12,000*	70.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Trichlorofluoromethane	NS	**130**	*18*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Vinyl acetate	NS	**41**	*960*	NS	5.0	UJ	L	2.5	2.0	U		1.0	2.0	U		1.0	2.5	1	1	1.5
Total Other VOCs	NS	NS	NS	NS	-			-	-			-	-			-	-	-	-	-
Total VOCs	NS	NS	NS	NS	-			-	-			-	-			-	-	-	-	-

TABLE C-2.2
Summary of Groundwater Data - Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l																			
					SH-05D																			
					9/11/2001				5/21/2002				11/4/2003				10/2/2006				SH-05D Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
AVOCs																								
Benzene $	5	**0.35**	*5*	5	0.25	UJ		0.13	0.22	UJ		0.11	0.15	UJ	L	0.08	2.0	U		1.0	1.0	0.075	1	0.3
Toluene	1,000	**72**	*150*	Total BTEX	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Ethylbenzene	700	**130**	*700*	Total BTEX	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1.0	1.0	1	1.0
Xylene (m,p-) †	10,000	**21**	*2,200*	Total BTEX	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	4.0	U		2.0	2	1.0	2	1.3
Xylene (o-) †	10,000	**21**	*3,300*	Total BTEX	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Styrene	100	**160**	*890*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Total BTEX	NS	NS	NS	100	-			-	-			-	-			-	-			-	-	-	-	-
Total AVOCs	NS	NS	NS	NS	-			-	-			-	-			-	-			-	-	-	-	-
CVOCs																								
Carbon tetrachloride $	5	**0.17**	*5*	4.4	0.45	UJ		0.23	0.53	UJ		0.27	0.33	UJ		0.17	2.0	U		1.0	1.0	0.2	1	0.4
Chlorobenzene	100	**11**	*39*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Chloroethane	NS	**4.6**	*2,800*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Chloroform $	NS	**0.17**	*80*	NS	0.33	UJ		0.17	0.27	UJ		0.14	0.11	UJ		0.06	2.0	U		1.0	1	0.055	1	0.3
Chloromethane	NS	**16**	*6.7*	NS	0.57	UJ		0.29	0.29	UJ		0.15	0.20	UJ		0.10	2.0	U		1.0	1	0.1	1	0.4
Dichloroethane (1,1-)	NS	**81**	*220*	70	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Dichloroethane (1,2-) $	5	**0.12**	*5*	5.0	0.18	UJ		0.09	0.29	UJ		0.15	0.17	UJ		0.09	2.0	U		1.0	1	0.085	1	0.3
Dichloroethene (1,1-)	7	**34**	*19*	3.2	0.43	UJ		0.22	0.19	UJ		0.10	0.30	UJ		0.15	2.0	U		1.0	1	0.095	1	0.4
Dichloroethene (cis-1,2-)	70	**6.1**	*21*	70	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Dichloroethene (trans-1,2-)	100	**12**	*18*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Dichloropropane (1,2-)	5	**0.16**	*3.5*	NS	0.15	UJ		0.08	0.24	UJ		0.12	0.14	UJ		0.07	2.0	U		1.0	1	0.07	1	0.3
Dichloropropene (cis-1,3-) ‡	NS	**0.40**	*0.84*	NS	0.23	UJ		0.12	0.22	UJ		0.11	0.14	UJ		0.07	2.0	U		1.0	1	0.07	1	0.3
Dichloropropene (trans-1,3-) ‡	NS	**0.40**	*0.84*	NS	0.21	UJ		0.11	0.23	UJ		0.12	0.10	UJ		0.05	2.0	U		1.0	1	0.05	1	0.3
Methylene chloride	5	**4.3**	*58*	4.6	0.20	UJ		0.10	0.21	UJ		0.11	0.25	UJ		0.13	2.0	U		1.0	1	0.1	1	0.3
Tetrachloroethane (1,1,2,2-)	NS	**0.055**	*3*	NS	0.16	UJ		0.08	0.12	UJ		0.06	0.090	UJ		0.045	2.0	U		1.0	1	0.045	1	0.3
Tetrachloroethene $	5	**0.1**	*5*	5.0	0.32	UJ		0.16	0.21	UJ		0.11	0.23	UJ		0.12	2.0	U		1.0	1	0.105	1	0.3
Trichloroethane (1,1,1-)	200	**320**	*310*	200	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Trichloroethane (1,1,2-) $	5	**0.20**	*5*	5.0	0.26	UJ		0.13	0.24	UJ		0.12	0.10	UJ		0.05	2.0	U		1.0	1	0.05	1	0.3
Trichloroethene $	5	**0.028**	*5*	5.0	**2.2**			**2.2**	**2.2**			**2.2**	**3.2**			**3.2**	**2.1**	J	H	**2.1**	3.2	2.1	2.1	2.4
Vinyl chloride $	2	**0.020**	*2*	2.0	0.75	UJ		0.38	0.58	UJ		0.29	0.32	UJ		0.16	2.0	U		1.0	1	0.16	1	0.5
Total CVOCs	NS	NS	NS	NS	2.2			2.2	2.2			2.2	-			-	2.1			2.1	2.2	2.1	2.1	2.2
Other VOCs																								
Acetone	NS	**550**	*22,000*	Monitor	20	UJ	L	10	5.0	U		2.5	2.0	U		1.0	5.0	U		2.5	10	1	2.5	4.0
Bromochloromethane	NS	NS	NS	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Bromodichloromethane	NS	**0.18**	*2.1*	NS	0.23	UJ		0.12	0.22	UJ		0.11	0.060	UJ		0.030	2.0	U		1.0	1	0.03	1	0.3
Bromoform	NS	**8.5**	*0.0083*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Bromomethane	NS	**0.87**	*2.0*	NS	1.1	UJ	I	0.6	0.51	UJ	I	0.26	0.78	UJ	I	0.39	2.0	UJ	I	1.0	1	0.3	1	0.5
Butanone (2-)	NS	**700**	*44,000*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Carbon disulfide	NS	**100**	*56*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Chloroethylvinyl ether (2-)	NS	NS	NS	NS	2.0	U		1.0		R			2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Dibromochloromethane	NS	**0.13**	*3.2*	NS	0.15	UJ		0.08	0.20	UJ		0.10	0.090	UJ		0.045	2.0	U		1.0	1	0.045	1	0.3
Hexanone (2-)	NS	NS	NS	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Methyl-2-pentanone (4-)	NS	**200**	*1,400*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Methyl-tert Butyl Ether	NS	**11**	*12,000*	70.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Trichlorofluoromethane	NS	**130**	*18*	NS	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	1	1	1	1.0
Vinyl acetate	NS	**41**	*960*	NS	5.0	UJ	L	2.5	2.0	U		1.0	2.0	U		1.0	2.0	U		1.0	2.5	1	1	1.4
Total Other VOCs	NS	NS	NS	NS	-			-	-			-	-			-	-			-	-	-	-	-
Total VOCs	NS	NS	NS	NS	2.2			2.2	2.2			2.2	-			-	2.1			2.1	2.2	2.1	2.1	2.2

TABLE C-2.2
Summary of Groundwater Data - Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l															
					SH-06D															
					9/6/2001				5/22/2002				10/29/2003				SH-06D Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
AVOCs																				
Benzene $	5	**0.35**	*5*	5	**3.7**	J		**3.7**	**3.0**	J		**3.0**	**5.1**	J	L	**5.1**	5.1	3.0	5.1	3.9
Toluene	1,000	**72**	*150*	Total BTEX	20	U		10	7.4	J		7.4	10	J	L	10	10	7.4	10	9.1
Ethylbenzene	700	**130**	*700*	Total BTEX	11	J		11	12			12	12	J	L	12	12.0	11	12	11.7
Xylene (m,p-) †	10,000	**21**	*2,200*	Total BTEX	**48**			**48**	**49**	J	I	**49**	**50**	J	L	**50**	50	48	50	49.0
Xylene (o-) †	10,000	**21**	*3,300*	Total BTEX	**45**			**45**	**48**	J	I	**48**	**48**	J	L	**48**	48	45	48	47.0
Styrene	100	**160**	*890*	NS	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Total BTEX	NS	NS	NS	100	107.7			107.7	119.4			119.4	125.1			125.1	125.1	107.7	125.1	117.4
Total AVOCs	NS	NS	NS	NS	107.7			107.7	119.4			119.4	125.1			125.1	125.1	107.7	125.1	117.4
CVOCs																				
Carbon tetrachloride $	5	**0.17**	*5*	4.4	4.5	UJ		2.3	2.6	UJ		1.3	3.6	UJ	L	1.8	2.3	1.3	1.8	1.8
Chlorobenzene	100	**11**	*39*	NS	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Chloroethane	NS	**4.6**	*2,800*	NS	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Chloroform $	NS	**0.17**	*80*	NS	4.1	UJ		2.1	1.4	UJ		0.7	0.70	UJ	L	0.35	2.05	0.35	0.35	1.0
Chloromethane	NS	**16**	*6.7*	NS	5.7	UJ		2.9	1.4	UJ		0.7	4.0	UJ	L	2.0	2.85	0.7	2	1.9
Dichloroethane (1,1-)	NS	**81**	*220*	70	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Dichloroethane (1,2-) $	5	**0.12**	*5*	5.0	1.8	UJ		0.9	1.4	UJ		0.7	0.50	UJ	L	0.25	0.9	0.25	0.25	0.6
Dichloroethene (1,1-)	7	**34**	*19*	3.2	4.3	UJ		2.2	0.95	UJ		0.48	1.1	UJ	L	0.6	2.15	0.48	0.55	1.1
Dichloroethene (cis-1,2-)	70	**6.1**	*21*	70	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Dichloroethene (trans-1,2-)	100	**12**	*18*	NS	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Dichloropropane (1,2-)	5	**0.16**	*3.5*	NS	1.5	UJ		0.8	1.2	UJ		0.6	0.85	UJ	L	0.43	0.75	0.43	0.43	0.6
Dichloropropene (cis-1,3-) ‡	NS	**0.40**	*0.84*	NS	2.3	UJ		1.2	1.1	UJ		0.6	1.0	UJ	L	0.5	1.15	0.5	0.5	0.7
Dichloropropene (trans-1,3-) ‡	NS	**0.40**	*0.84*	NS	2.1	UJ		1.1	1.2	UJ		0.6	0.55	UJ	L	0.28	1.05	0.28	0.28	0.6
Methylene chloride	5	**4.3**	*58*	4.6	2.3	UJ		1.2	3.5	UJ		1.8	7.8	UJ	L	3.9	3.9	1.15	3.9	2.3
Tetrachloroethane (1,1,2,2-)	NS	**0.055**	*3*	NS	1.6	UJ		0.8	0.60	UJ		0.30	1.6	UJ	L	0.8	0.8	0.3	0.8	0.6
Tetrachloroethene $	5	**0.1**	*5*	5.0	3.2	UJ		1.6	1.0	UJ		0.5	0.75	UJ	L	0.38	1.6	0.375	0.375	0.8
Trichloroethane (1,1,1-)	200	**320**	*310*	200	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Trichloroethane (1,1,2-) $	5	**0.20**	*5*	5.0	2.6	UJ		1.3	1.2	UJ		0.6	0.60	UJ	L	0.30	1.3	0.3	0.3	0.7
Trichloroethene $	5	**0.028**	*5*	5.0	2.6	UJ		1.3	1.3	UJ		0.7	0.90	UJ	L	0.45	1.3	0.45	0.45	0.8
Vinyl chloride $	2	**0.020**	*2*	2.0	7.5	UJ		3.8	2.9	UJ		1.5	1.6	UJ	L	0.8	3.75	0.8	0.8	2.0
Total CVOCs	NS	NS	NS	NS	-			-	-			-	-			-	-	-	-	-
Other VOCs																				
Acetone	NS	**550**	*22,000*	Monitor	50	J	I	50	69			69	84	J	L	84	84	50	84	67.7
Bromochloromethane	NS	NS	NS	NS	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Bromodichloromethane	NS	**0.18**	*2.1*	NS	2.3	UJ		1.2	1.1	UJ		0.6	1.2	UJ	L	0.6	1.15	0.55	0.6	0.8
Bromoform	NS	**8.5**	*0.0083*	NS	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Bromomethane	NS	**0.87**	*2.0*	NS	11	UJ	I	5.5	0.80	UJ		0.40	7.7	UJ	I	3.9	5.5	0.4	3.85	3.3
Butanone (2-)	NS	**700**	*44,000*	NS	20	U		10	10	U		5	9.2	J	L	9.2	10	5	9.2	8.1
Carbon disulfide	NS	**100**	*56*	NS	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Chloroethylvinyl ether (2-)	NS	NS	NS	NS	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Dibromochloromethane	NS	**0.13**	*3.2*	NS	1.5	UJ		0.8	1.0	UJ		0.5	0.75	UJ	L	0.38	0.75	0.38	0.38	0.5
Hexanone (2-)	NS	NS	NS	NS	20	U		10	25	U		12.5	25	UJ	L	12.5	12.5	10	12.5	11.7
Methyl-2-pentanone (4-)	NS	**200**	*1,400*	NS	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Methyl-tert Butyl Ether	NS	**11**	*12,000*	70.0	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Trichlorofluoromethane	NS	**130**	*18*	NS	20	U		10	10	U		5	10	UJ	L	5	10	5	5	6.7
Vinyl acetate	NS	**41**	*960*	NS	50	UJ	L	25	10	U		5	10	UJ	L	5	25	5	5	11.7
Total Other VOCs	NS	NS	NS	NS	50			50	69			69	93.2			93.2	93.2	50	93.2	70.7
Total VOCs	NS	NS	NS	NS	157.7			157.7	188.4			188.4	218.3			218.3	218.3	157.7	218.3	188.1

TABLE C-2.2
Summary of Groundwater Data - Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Concentrations in µg/l												Concentrations in µg/l			
	COPC Screening Levels			RGP Effluent Criteria	Shallow Well Summary				Deep Well Summary				Estimated Influent Concentration			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Maximum	Minimum	Most Recent	Mean	Maximum	Minimum	Most Recent	Mean	Maximum	Minimum	Most Recent	Mean
AVOCs																
Benzene $	5	**0.35**	*5*	5	14.9	4.2	4.92	8.2	3.1	1.5	3.05	2.1	13.7	3.9	4.73	7.6
Toluene	1,000	**72**	*150*	Total BTEX	17.9	5.55	5.55	10.2	5.5	4.2	5.5	5.1	16.66	5.42	5.545	9.7
Ethylbenzene	700	**130**	*700*	Total BTEX	8.5	4.0	4	5.7	6.5	6	6.5	6.3	8.3	4.2	4.25	5.8
Xylene (m,p-) †	10,000	**21**	*2,200*	Total BTEX	13.55	5.3	7.3	8.3	26	24.5	26	25.1	14.80	7.18	9.17	10.0
Xylene (o-) †	10,000	**21**	*3,300*	Total BTEX	7.83	4	4.225	5.6	24.5	23	24.5	24.0	9.49	5.9	6.25	7.4
Styrene	100	**160**	*890*	NS	6	4	4	4.9	5.5	3	3	3.8	5.95	3.9	3.9	4.8
Total BTEX	NS	NS	NS	100	77.63	13.3	24.95	40.6	125.1	107.7	125.1	117.4	82.38	22.74	34.97	48.3
Total AVOCs	NS	NS	NS	NS	81.97	13.3	24.95	42.2	125.1	107.7	125.1	117.4	86.28	22.74	34.97	49.7
CVOCs																
Carbon tetrachloride $	5	**0.17**	*5*	4.4	3.0	0.9	2.99	1.6	1.6	0.7	1.4	1.1	2.9	0.9	2.83	1.6
Chlorobenzene	100	**11**	*39*	NS	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Chloroethane	NS	**4.6**	*2,800*	NS	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Chloroform $	NS	**0.17**	*80*	NS	7.15	0.28	2.60	2.7	1.53	0.20	0.68	0.7	6.59	0.27	2.41	2.5
Chloromethane	NS	**16**	*6.7*	NS	3.07	0.73	3.03	1.6	1.93	0.4	1.5	1.1	2.96	0.69	2.87	1.5
Dichloroethane (1,1-)	NS	**81**	*220*	70	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Dichloroethane (1,2-) $	5	**0.12**	*5*	5.0	2.71	0.21	2.58	1.0	0.95	0.17	0.63	0.5	2.54	0.20	2.39	0.9
Dichloroethene (1,1-)	7	**34**	*19*	3.2	2.83	0.40	2.68	1.1	1.58	0.29	0.78	0.7	2.70	0.39	2.49	1.1
Dichloroethene (cis-1,2-)	70	**6.1**	*21*	70	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Dichloroethene (trans-1,2-)	100	**12**	*18*	NS	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Dichloropropane (1,2-)	5	**0.16**	*3.5*	NS	2.68	0.30	2.62	1.0	0.88	0.25	0.71	0.5	2.50	0.29	2.43	0.9
Dichloropropene (cis-1,3-) ‡	NS	**0.40**	*0.84*	NS	2.68	0.39	2.64	1.0	1.08	0.29	0.75	0.5	2.52	0.38	2.45	1.0
Dichloropropene (trans-1,3-) ‡	NS	**0.40**	*0.84*	NS	2.68	0.22	2.58	1.0	1.03	0.16	0.64	0.5	2.51	0.21	2.39	0.9
Methylene chloride	5	**4.3**	*58*	4.6	3.51	0.45	3.51	1.9	2.45	0.63	2.45	1.3	3.40	0.47	3.40	1.8
Tetrachloroethane (1,1,2,2-)	NS	**0.055**	*3*	NS	2.72	0.26	2.71	1.1	0.9	0.17	0.9	0.5	2.54	0.25	2.53	1.0
Tetrachloroethene $	5	**0.1**	*5*	5.0	2.74	0.31	2.62	1.0	1.3	0.24	0.69	0.6	2.60	0.30	2.43	1.0
Trichloroethane (1,1,1-)	200	**320**	*310*	200	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Trichloroethane (1,1,2-) $	5	**0.20**	*5*	5.0	2.70	0.24	2.59	1.0	1.15	0.18	0.65	0.5	2.54	0.23	2.39	1.0
Trichloroethene $	5	**0.028**	*5*	5.0	2.70	0.36	2.64	1.1	2.25	1.28	1.28	1.6	2.65	0.45	2.50	1.1
Vinyl chloride $	2	**0.020**	*2*	2.0	3.07	0.64	2.74	1.6	2.38	0.48	0.9	1.2	3.00	0.62	2.56	1.6
Total CVOCs	NS	NS	NS	NS	-	-	-	-	2.2	2.1	2.1	2.2	-	-	-	-
Other VOCs																
Acetone	NS	**550**	*22,000*	Monitor	31	10	10	17.0	47	25.5	43.25	35.8	32.6	11.55	13.33	18.9
Bromochloromethane	NS	NS	NS	NS	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Bromodichloromethane	NS	**0.18**	*2.1*	NS	2.68	0.43	2.66	1.5	1.075	0.29	0.8	0.5	2.52	0.42	2.47	1.4
Bromoform	NS	**8.5**	*0.0083*	NS	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Bromomethane	NS	**0.87**	*2.0*	NS	3.6	0.8	3.56	2.3	3.25	0.3	2.43	1.9	3.57	0.7	3.45	2.3
Butanone (2-)	NS	**700**	*44,000*	NS	5.6	4	4	4.4	5.5	3	5.1	4.5	5.59	3.9	4.11	4.4
Carbon disulfide	NS	**100**	*56*	NS	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Chloroethylvinyl ether (2-)	NS	NS	NS	NS	5.25	4	4	4.4	5.5	3	3	3.8	5.28	3.9	3.9	4.4
Dibromochloromethane	NS	**0.13**	*3.2*	NS	2.65	0.29	2.61	1.1	0.88	0.21	0.69	0.4	2.47	0.28	2.41	1.0
Hexanone (2-)	NS	NS	NS	NS	11	4	5.88	6.9	6.75	5.5	6.75	6.3	10.58	4.15	5.96	6.8
Methyl-2-pentanone (4-)	NS	**200**	*1,400*	NS	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Methyl-tert Butyl Ether	NS	**11**	*12,000*	70.0	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Trichlorofluoromethane	NS	**130**	*18*	NS	5.25	4	4	4.3	5.5	3	3	3.8	5.28	3.9	3.9	4.3
Vinyl acetate	NS	**41**	*960*	NS	10	4	4	5.8	13.75	3	3	6.5	10.38	3.9	3.9	5.9
Total Other VOCs	NS	NS	NS	NS	21.13	17.8	-	19.5	93.2	50	93.2	70.7	28.34	21.02	-	24.6
Total VOCs	NS	NS	NS	NS	99.1	15.2	24.95	49.4	110.25	79.9	110.2	95.2	100.22	21.67	33.48	54.0

TABLE C-2.3
Summary of Groundwater Data - Semi-Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l																			
					SH-04S																			
	EPA MCLs	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening Values		9/11/2001				5/20/2002				10/28/2003				10/4/2006				SH-04S Summary			
					Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
PAHs																								
Acenaphthene	NS	**37**	NS	Group II	20			20	7.0			7.0	14			14	6.2			6.2	20.00	6.20	6.20	11.80
Acenaphthylene	NS	NS	NS	Group II	9.2			9.2	3.7			3.7	5.8			5.8	2.2			2.2	9.20	2.20	2.20	5.23
Anthracene	NS	**180**	NS	Group II	4.6			4.6	1.4			1.4	2.4			2.4	0.65			0.65	4.60	0.65	0.65	2.26
Benzo(a)anthracene	NS	**0.092**	NS	0.0038 & Group I	**0.75**			**0.75**	**0.40**			**0.40**	1.0	U		0.5	0.052			0.052	0.75	0.05	0.05	0.43
Benzo(a)pyrene	0.2	**0.0092**	NS	0.0038 & Group I	**0.49**	J	I	**0.49**	**0.24**	J		**0.24**	**0.18**	J	I	**0.18**	**0.036**			**0.036**	0.49	0.04	0.04	0.24
Benzo(b)fluoranthene	NS	**0.092**	NS	0.0038 & Group I	0.51	U		0.26	0.26	U		0.13	1.0	U		0.5	0.017			0.017	0.50	0.02	0.02	0.23
Benzo(g,h,i)perylene	NS	NS	NS	Group II	0.51	U		0.26	0.26	U		0.13	1.0	U		0.5	0.020			0.020	0.50	0.02	0.02	0.23
Benzo(k)fluoranthene	NS	**0.92**	NS	0.0038 & Group I	0.51	U		0.26	0.26	U		0.13	1.0	U		0.5	0.019			0.019	0.50	0.02	0.02	0.23
Chrysene	NS	**9.2**	NS	0.0038 & Group I	0.75			0.75	0.31			0.31	1.0	U		0.5	0.054			0.054	0.75	0.05	0.05	0.40
Dibenz(a,h)anthracene	NS	**0.0092**	NS	0.0038 & Group I	**0.11**	J	I	**0.11**	**0.021**	J		**0.021**	0.044	UJ		0.022	0.010	U		0.005	0.11	0.01	0.01	0.04
Fluoranthene	NS	**150**	NS	Group II	3.0			3.0	1.2			1.2	1.3			1.3	0.35			0.35	3.00	0.35	0.35	1.46
Fluorene	NS	**24**	NS	Group II	12			12	4.2			4.2	8.8			8.8	4.6			4.6	12.00	4.20	4.60	7.40
Indeno(1,2,3-cd)pyrene	NS	**0.092**	NS	0.0038 & Group I	0.51	U		0.26	0.26	U		0.13	1.0	U		0.5	0.015			0.015	0.50	0.02	0.02	0.23
Methylnaphthalene (2-)	NS	NS	*330*	NS	96			96	35			35	59			59	16			16	96.00	16.00	16.00	51.50
Naphthalene	NS	**0.62**	*15*	20 & Group II	***310***			***310***	***140***			***140***	***200***			***200***	***71***			***71***	310.00	71.00	71.00	180.25
Phenanthrene	NS	NS	NS	Group II	24			24	6.5			6.5	14			14	4.3			4.3	24.00	4.30	4.30	12.20
Pyrene	NS	**18**	NS	Group II	4.0			4.0	1.9			1.9	2.1			2.1	0.45			0.45	4.00	0.45	0.45	2.11
Group I PAHs	NS	NS	NS	10.0	2.1			2.1	0.97			0.97	0.18			0.18	0.193			0.193	2.10	0.18	0.19	0.86
Group II PAHs	NS	NS	NS	100	386.8			386.8	157.5			157.5	248.4			248.4	89.77			89.77	386.80	89.77	89.77	220.62
Total PAHs	NS	NS	NS	NS	484.9			484.9	201.871			201.871	307.58			307.58	106.803			106.803	484.90	106.80	106.80	275.29
Other SVOCs																								
Benzoic acid	NS	**15,000**	NS	NS		R			3.7	J	L	3.7									3.70	3.70	3.70	3.70
Benzyl Alcohol	NS	**1,100**	NS	NS	20	U		10	5.2	UJ	L	2.6									10.00	2.60	2.60	6.30
bis(2-Chloroethoxy)methane	NS	NS	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
bis(2-Chloroethyl)ether	NS	**0.01**	*10*	NS	6.0	UJ		3.0	0.96	UJ		0.48									3.00	0.48	0.48	1.74
bis(2-Chloroisopropyl)ether	NS	**0.27**	*51*	NS	6.0	UJ		3.0	0.96	UJ		0.48									3.00	0.48	0.48	1.74
bis(2-Ethylhexyl)phthalate	6	**4.8**	NS	6.0	6.0	UJ		3.0	0.96	UJ		0.48	10	U		5	1.0	U		0.5	5.00	0.48	0.50	2.25
Bromophenyl-phenylether (4-)	NS	NS	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Butylbenzylphthalate	NS	**730**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Carbazole	NS	**3.4**	NS	NS	6.0	UJ		3.0	1.4	J		1.4	10	U		5	0.84			0.84	5.00	0.84	0.84	2.56
Chloro-3-methylphenol (4-)	NS	NS	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Chloroaniline (4-)	NS	**15**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Chloronaphthalene (2-)	NS	**49**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Chlorophenol (2-)	NS	**3.0**	*110*	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Chlorophenyl-phenylether (4-)	NS	NS	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Dibenzofuran	NS	**1.2**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Dichlorobenzene (1,2-)	600	**37**	*260*	600	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Dichlorobenzene (1,3-)	NS	**18**	*83*	320	6.0	UJ		3.0	0.96	UJ		0.48									3.00	0.48	0.48	1.74
Dichlorobenzene (1,4-)	75	**0.50**	*820*	5.0	6.0	UJ		3.0	0.96	UJ		0.48									3.00	0.48	0.48	1.74
Dichlorobenzidine (3,3'-)	NS	**0.15**	NS	NS	6.0	UJ		3.0	4.1	UJ		2.1									3.00	2.05	2.05	2.53
Dichlorophenol (2,4-)	NS	**11**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Diethylphthalate	NS	**2,900**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Dimethylphenol (2,4-)	NS	**73**	NS	NS	9.2	J		9.2	4.3	J		4.3									9.20	4.30	4.30	6.75
Dimethylphthalate	NS	**36,000**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Di-n-butylphthalate	NS	**360**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Dinitro-2-methylphenol (4,6-)	NS	**0.36**	NS	NS	51	U		25.5	5.2	U		2.6									25.50	2.60	2.60	14.05
Dinitrophenol (2,4-)	NS	**7.3**	NS	NS	20	UJ	I	10	5.2	UJ	I	2.6									10.00	2.60	2.60	6.30
Dinitrotoluene (2,4-)	NS	**7.3**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Dinitrotoluene (2,6-)	NS	**3.6**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Di-n-octylphthalate	NS	**150**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Hexachlorobenzene $	1	**0.042**	*1*	NS	6.0	UJ		3.0	0.96	UJ		0.48									3.00	0.48	0.48	1.74
Hexachlorobutadiene	NS	**0.86**	*0.33*	NS	6.0	UJ		3.0	0.96	UJ		0.48									3.00	0.48	0.48	1.74
Hexachlorocyclopentadiene $	50	**22**	*50*	NS	51	UJ	L	25.5	2.1	U		1.1									25.50	1.05	1.05	13.28
Hexachloroethane	NS	**3.6**	*3.8*	NS	20	UJ	L	10	2.1	U		1.1									10.00	1.05	1.05	5.53
Isophorone	NS	**71**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Methylphenol (2-)	NS	**180**	NS	NS	20	U		10	1.4	J		1.4									10.00	1.40	1.40	5.70
Methylphenol (4-)	NS	**18**	NS	NS	8.5	J		8.5	5.2			5.2									8.50	5.20	5.20	6.85
Nitroaniline (2-)	NS	**11**	NS	NS	6.0	UJ		3.0	0.96	UJ		0.48									3.00	0.48	0.48	1.74
Nitroaniline (3-)	NS	**1.1**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Nitroaniline (4-)	NS	**3.2**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Nitrobenzene	NS	**0.34**	*200*	NS	6.0	UJ		3.0	0.96	UJ		0.48									3.00	0.48	0.48	1.74
Nitrophenol (2-)	NS	NS	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Nitrophenol (4-)	NS	NS	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Nitroso-di-n-propylamine (N-)	NS	**0.0096**	NS	NS	6.0	UJ		3.0	0.96	UJ		0.48									3.00	0.48	0.48	1.74
Nitrosodiphenylamine (N-)	NS	**14**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Pentachlorophenol	1	**0.56**	NS	1.0	6.0	UJ		3.0	0.96	UJ		0.48									3.00	0.48	0.48	1.74
Phenol	NS	**1,100**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Trichlorobenzene (1,2,4-)	NS	**0.72**	*340*	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Trichlorophenol (2,4,5-)	NS	**360**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Trichlorophenol (2,4,6-)	NS	**0.36**	NS	NS	20	U		10	2.1	U		1.1									10.00	1.05	1.05	5.53
Total Phenols	NS	NS	NS	300	17.7			17.7	10.9			10.9									17.70	10.90	10.90	14.30
Total Other SVOCs	NS	NS	NS	NS	17.7			17.7	16			16	-			-	0.84			0.84	17.70	0.84	16.00	11.51
Total SVOCs	NS	NS	NS	NS	502.6			502.6	217.871			217.871	307.58			307.58	107.643			107.643	502.60	107.64	217.87	283.92

TABLE C-2.3
Summary of Groundwater Data - Semi-Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l																			
					SH-05S																			
					9/11/2001				5/21/2002				10/29/2003				10/4/2006				SH-05S Summary			
	EPA MCLs	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening Values		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
PAHs																								
Acenaphthene	NS	**37**	NS	Group II	11			11	9.1			9.1	5.6			5.6	6.8			6.8	11.00	5.60	6.80	8.13
Acenaphthylene	NS	NS	NS	Group II	3.2			3.2	2.6			2.6	1.2			1.2	1.8			1.8	3.20	1.20	1.80	2.20
Anthracene	NS	**180**	NS	Group II	3.0			3.0	2.9			2.9	1.7			1.7	2.0			2.0	3.00	1.70	2.00	2.40
Benzo(a)anthracene	NS	**0.092**	NS	0.0038 & Group I	**0.43**			**0.43**	**0.51**			**0.51**	0.52	U		0.26	**0.32**			**0.32**	0.51	0.26	0.32	0.38
Benzo(a)pyrene	0.2	**0.0092**	NS	0.0038 & Group I	**0.29**			**0.29**	**0.26**			**0.26**	**0.081**	J	I	**0.081**	**0.16**			**0.16**	0.29	0.08	0.16	0.20
Benzo(b)fluoranthene	NS	**0.092**	NS	0.0038 & Group I	0.21	U		0.11	**0.11**			**0.11**	0.52	U		0.26	0.090			0.090	0.26	0.09	0.09	0.14
Benzo(g,h,i)perylene	NS	NS	NS	Group II	0.21	U		0.11	0.10	U		0.05	0.52	U		0.26	0.046			0.046	0.26	0.05	0.05	0.12
Benzo(k)fluoranthene	NS	**0.92**	NS	0.0038 & Group I	0.21	U		0.11	0.12			0.12	0.52	U		0.26	0.071			0.071	0.26	0.07	0.07	0.14
Chrysene	NS	**9.2**	NS	0.0038 & Group I	0.40			0.40	0.40			0.40	0.52	U		0.26	0.30			0.30	0.40	0.26	0.30	0.34
Dibenz(a,h)anthracene	NS	**0.0092**	NS	0.0038 & Group I	**0.051**	J	I	**0.051**	**0.026**	J		**0.026**	0.022	UJ		0.011	**0.018**			**0.018**	0.05	0.01	0.02	0.03
Fluoranthene	NS	**150**	NS	Group II	2.5			2.5	2.2			2.2	1.1			1.1	1.8			1.8	2.50	1.10	1.80	1.90
Fluorene	NS	**24**	NS	Group II	9.1			9.1	8.4			8.4	4.7			4.7	7.2			7.2	9.10	4.70	7.20	7.35
Indeno(1,2,3-cd)pyrene	NS	**0.092**	NS	0.0038 & Group I	0.21	U		0.11	0.10	U		0.05	0.52	U		0.26	0.036			0.036	0.26	0.04	0.04	0.11
Methylnaphthalene (2-)	NS	NS	*330*	NS	33			33	20			20	12			12	19			19	33.00	12.00	19.00	21.00
Naphthalene	NS	**0.62**	*15*	20 & Group II	***72***			***72***	***52***			***52***	***27***			***27***	***42***			***42***	72.00	27.00	42.00	48.25
Phenanthrene	NS	NS	NS	Group II	23			23	18			18	12			12	16			16	23.00	12.00	16.00	17.25
Pyrene	NS	**18**	NS	Group II	2.4			2.4	2.9			2.9	1.4			1.4	2.2			2.2	2.90	1.40	2.20	2.23
Group I PAHs	NS	NS	NS	10.0	1.171			1.171	1.43			1.43	0.081			0.081	0.995			0.995	1.43	0.08	1.00	0.92
Group II PAHs	NS	NS	NS	100	126.2			126.2	98.1			98.1	54.7			54.7	79.846			79.846	126.20	54.70	79.85	89.71
Total PAHs	NS	NS	NS	NS	160.371			160.371	119.526			119.526	66.781			66.781	100.581			100.581	160.37	66.78	100.58	111.81
Other SVOCs																								
Benzoic acid	NS	**15,000**	NS	NS		R				R											0.00	0.00	0.00	0.00
Benzyl Alcohol	NS	**1,100**	NS	NS	8.4	U		4.2	5.2	UJ	L	2.6									4.20	2.60	2.60	3.40
bis(2-Chloroethoxy)methane	NS	NS	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
bis(2-Chloroethyl)ether	NS	**0.01**	*10*	NS	2.5	UJ		1.3	0.97	UJ		0.49									1.25	0.49	0.49	0.87
bis(2-Chloroisopropyl)ether	NS	**0.27**	*51*	NS	2.5	UJ		1.3	0.97	UJ		0.49									1.25	0.49	0.49	0.87
bis(2-Ethylhexyl)phthalate	6	**4.8**	NS	6.0	2.5	UJ		1.3	0.97	UJ		0.49	5.2	U		2.6	1.0	U		0.5	2.60	0.49	0.50	1.21
Bromophenyl-phenylether (4-)	NS	NS	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Butylbenzylphthalate	NS	**730**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Carbazole	NS	**3.4**	NS	NS	2.5	UJ		1.3	1.1	J		1.1	5.2	U		2.6	0.74			0.74	2.60	0.74	0.74	1.42
Chloro-3-methylphenol (4-)	NS	NS	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Chloroaniline (4-)	NS	**15**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Chloronaphthalene (2-)	NS	**49**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Chlorophenol (2-)	NS	**3.0**	*110*	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Chlorophenyl-phenylether (4-)	NS	NS	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Dibenzofuran	NS	**1.2**	NS	NS	8.4	U		4.2	1.1	J		1.1									4.20	1.10	1.10	2.65
Dichlorobenzene (1,2-)	600	**37**	*260*	600	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Dichlorobenzene (1,3-)	NS	**18**	*83*	320	2.5	UJ		1.3	0.97	UJ		0.49									1.25	0.49	0.49	0.87
Dichlorobenzene (1,4-)	75	**0.50**	*820*	5.0	2.5	UJ		1.3	0.97	UJ		0.49									1.25	0.49	0.49	0.87
Dichlorobenzidine (3,3'-)	NS	**0.15**	NS	NS	2.5	UJ		1.3	4.1	UJ		2.1									2.05	1.25	2.05	1.65
Dichlorophenol (2,4-)	NS	**11**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Diethylphthalate	NS	**2,900**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Dimethylphenol (2,4-)	NS	**73**	NS	NS	8.4	U		4.2	1.1	J		1.1									4.20	1.10	1.10	2.65
Dimethylphthalate	NS	**36,000**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Di-n-butylphthalate	NS	**360**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Dinitro-2-methylphenol (4,6-)	NS	**0.36**	NS	NS	21	U		10.5	5.2	U		2.6									10.50	2.60	2.60	6.55
Dinitrophenol (2,4-)	NS	**7.3**	NS	NS	8.4	UJ	I	4.2	5.2	UJ	I	2.6									4.20	2.60	2.60	3.40
Dinitrotoluene (2,4-)	NS	**7.3**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Dinitrotoluene (2,6-)	NS	**3.6**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Di-n-octylphthalate	NS	**150**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Hexachlorobenzene $	1	**0.042**	*1*	NS	2.5	UJ		1.3	0.97	UJ		0.49									1.25	0.49	0.49	0.87
Hexachlorobutadiene	NS	**0.86**	*0.33*	NS	2.5	UJ		1.3	0.97	UJ		0.49									1.25	0.49	0.49	0.87
Hexachlorocyclopentadiene $	50	**22**	*50*	NS	21	UJ	L	10.5	2.1	U		1.1									10.50	1.05	1.05	5.78
Hexachloroethane	NS	**3.6**	*3.8*	NS	8.4	UJ	L	4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Isophorone	NS	**71**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Methylphenol (2-)	NS	**180**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Methylphenol (4-)	NS	**18**	NS	NS	8.4	U		4.2	1.3	J		1.3									4.20	1.30	1.30	2.75
Nitroaniline (2-)	NS	**11**	NS	NS	2.5	UJ		1.3	0.97	UJ		0.49									1.25	0.49	0.49	0.87
Nitroaniline (3-)	NS	**1.1**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Nitroaniline (4-)	NS	**3.2**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Nitrobenzene	NS	**0.34**	*200*	NS	2.5	UJ		1.3	0.97	UJ		0.49									1.25	0.49	0.49	0.87
Nitrophenol (2-)	NS	NS	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Nitrophenol (4-)	NS	NS	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Nitroso-di-n-propylamine (N-)	NS	**0.0096**	NS	NS	2.5	UJ		1.3	0.97	UJ		0.49									1.25	0.49	0.49	0.87
Nitrosodiphenylamine (N-)	NS	**14**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Pentachlorophenol	1	**0.56**	NS	1.0	2.5	UJ		1.3	0.97	UJ		0.49									1.25	0.49	0.49	0.87
Phenol	NS	**1,100**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Trichlorobenzene (1,2,4-)	NS	**0.72**	*340*	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Trichlorophenol (2,4,5-)	NS	**360**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Trichlorophenol (2,4,6-)	NS	**0.36**	NS	NS	8.4	U		4.2	2.1	U		1.1									4.20	1.05	1.05	2.63
Total Phenols	NS	NS	NS	300	-			-	2.4			2.4									2.40	2.40	2.40	2.40
Total Other SVOCs	NS	NS	NS	NS	-			-	4.6			4.6	-			-	0.74			0.74	4.60	0.74	4.60	2.67
Total SVOCs	NS	NS	NS	NS	160.371			160.371	124.126			124.126	66.781			66.781	101.321			101.321	160.37	66.78	124.13	113.15

TABLE C-2.3
Summary of Groundwater Data - Semi-Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l															
					SH-06S															
					9/6/2001				5/22/2002				10/29/2003				SH-06S Summary			
	EPA MCLs	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening Values		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
PAHs																				
Acenaphthene	NS	**37**	NS	Group II	1.7			1.7	2.0			2.0	3.4			3.4	3.40	1.70	3.40	2.37
Acenaphthylene	NS	NS	NS	Group II	0.33			0.33	0.41			0.41	0.43			0.43	0.43	0.33	0.43	0.39
Anthracene	NS	**180**	NS	Group II	0.30			0.30	0.22			0.22	0.24			0.24	0.30	0.22	0.24	0.25
Benzo(a)anthracene	NS	**0.092**	NS	0.0038 & Group I	**0.18**			**0.18**	**0.14**			**0.14**	0.23	U		0.12	0.18	0.12	0.12	0.15
Benzo(a)pyrene	0.2	**0.0092**	NS	0.0038 & Group I	**0.19**			**0.19**	**0.12**			**0.12**	**0.10**	J	I	**0.10**	0.19	0.10	0.10	0.14
Benzo(b)fluoranthene	NS	**0.092**	NS	0.0038 & Group I	**0.14**			**0.14**	0.084			0.084	0.23	U		0.12	0.14	0.08	0.12	0.11
Benzo(g,h,i)perylene	NS	NS	NS	Group II	0.12			0.12	0.076			0.076	0.23	U		0.12	0.12	0.08	0.12	0.10
Benzo(k)fluoranthene	NS	**0.92**	NS	0.0038 & Group I	0.10			0.10	0.052			0.052	0.23	U		0.12	0.12	0.05	0.12	0.09
Chrysene	NS	**9.2**	NS	0.0038 & Group I	0.18			0.18	0.13			0.13	0.23	U		0.12	0.18	0.12	0.12	0.14
Dibenz(a,h)anthracene	NS	**0.0092**	NS	0.0038 & Group I	**0.029**	J		**0.029**	**0.023**	J		**0.023**	0.0098	UJ		0.0049	0.03	0.00	0.00	0.02
Fluoranthene	NS	**150**	NS	Group II	0.68			0.68	0.29			0.29	0.36			0.36	0.68	0.29	0.36	0.44
Fluorene	NS	**24**	NS	Group II	1.1			1.1	1.2			1.2	1.8			1.8	1.80	1.10	1.80	1.37
Indeno(1,2,3-cd)pyrene	NS	**0.092**	NS	0.0038 & Group I	0.087			0.087	0.057			0.057	0.23	U		0.12	0.12	0.06	0.12	0.09
Methylnaphthalene (2-)	NS	NS	*330*	NS	7.2			7.2	8.3			8.3	8.1			8.1	8.30	7.20	8.10	7.87
Naphthalene	NS	**0.62**	*15*	20 & Group II	***34***			***34***	***28***			***28***	***36***			***36***	36.00	28.00	36.00	32.67
Phenanthrene	NS	NS	NS	Group II	2.2			2.2	1.3			1.3	2.2			2.2	2.20	1.30	2.20	1.90
Pyrene	NS	**18**	NS	Group II	0.60			0.60	0.35			0.35	0.58			0.58	0.60	0.35	0.58	0.51
Group I PAHs	NS	NS	NS	10.0	0.906			0.906	0.606			0.606	0.10			0.10	0.91	0.10	0.10	0.54
Group II PAHs	NS	NS	NS	100	41.03			41.03	33.85			33.85	45.01			45.01	45.01	33.85	45.01	39.96
Total PAHs	NS	NS	NS	NS	49.136			49.136	42.752			42.752	53.21			53.21	53.21	42.75	53.21	48.37
Other SVOCs																				
Benzoic acid	NS	**15,000**	NS	NS	1.0	J	L	1.0	1.1	J	L	1.1					1.10	1.00	1.10	1.05
Benzyl Alcohol	NS	**1,100**	NS	NS	2.0	U		1.0	5.2	UJ	L	2.6					2.60	1.00	2.60	1.80
bis(2-Chloroethoxy)methane	NS	NS	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
bis(2-Chloroethyl)ether	NS	**0.01**	*10*	NS	0.60	UJ		0.30	0.96	UJ		0.48					0.48	0.30	0.48	0.39
bis(2-Chloroisopropyl)ether	NS	**0.27**	*51*	NS	0.60	UJ		0.30	0.96	UJ		0.48					0.48	0.30	0.48	0.39
bis(2-Ethylhexyl)phthalate	6	**4.8**	NS	6.0	**12**			**12**	0.96	UJ		0.48	2.3	U		1.2	12.00	0.48	1.15	4.54
Bromophenyl-phenylether (4-)	NS	NS	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Butylbenzylphthalate	NS	**730**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Carbazole	NS	**3.4**	NS	NS	0.68	J		0.68	0.96	UJ		0.48	2.3	U		1.2	1.15	0.48	1.15	0.77
Chloro-3-methylphenol (4-)	NS	NS	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Chloroaniline (4-)	NS	**15**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Chloronaphthalene (2-)	NS	**49**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Chlorophenol (2-)	NS	**3.0**	*110*	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Chlorophenyl-phenylether (4-)	NS	NS	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dibenzofuran	NS	**1.2**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dichlorobenzene (1,2-)	600	**37**	*260*	600	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dichlorobenzene (1,3-)	NS	**18**	*83*	320	0.60	UJ		0.30	0.96	UJ		0.48					0.48	0.30	0.48	0.39
Dichlorobenzene (1,4-)	75	**0.50**	*820*	5.0	0.60	UJ		0.30	0.96	UJ		0.48					0.48	0.30	0.48	0.39
Dichlorobenzidine (3,3'-)	NS	**0.15**	NS	NS	0.60	UJ		0.30	4.1	UJ		2.1					2.05	0.30	2.05	1.18
Dichlorophenol (2,4-)	NS	**11**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Diethylphthalate	NS	**2,900**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dimethylphenol (2,4-)	NS	**73**	NS	NS	2.0	U		1.0	5.2	U		2.6					2.60	1.00	2.60	1.80
Dimethylphthalate	NS	**36,000**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Di-n-butylphthalate	NS	**360**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dinitro-2-methylphenol (4,6-)	NS	**0.36**	NS	NS	5.0	U		2.5	5.2	U		2.6					2.60	2.50	2.60	2.55
Dinitrophenol (2,4-)	NS	**7.3**	NS	NS	2.0	UJ	I	1.0	5.2	UJ	I	2.6					2.60	1.00	2.60	1.80
Dinitrotoluene (2,4-)	NS	**7.3**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dinitrotoluene (2,6-)	NS	**3.6**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Di-n-octylphthalate	NS	**150**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Hexachlorobenzene $	1	**0.042**	*1*	NS	0.60	UJ		0.30	0.96	UJ		0.48					0.48	0.30	0.48	0.39
Hexachlorobutadiene	NS	**0.86**	*0.33*	NS	0.60	UJ		0.30	0.96	UJ		0.48					0.48	0.30	0.48	0.39
Hexachlorocyclopentadiene $	50	**22**	*50*	NS	5.0	U		2.5	2.1	U		1.1					2.50	1.05	1.05	1.78
Hexachloroethane	NS	**3.6**	*3.8*	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Isophorone	NS	**71**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Methylphenol (2-)	NS	**180**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Methylphenol (4-)	NS	**18**	NS	NS	1.1	J		1.1	2.1	U		1.1					1.10	1.05	1.05	1.08
Nitroaniline (2-)	NS	**11**	NS	NS	0.60	UJ		0.30	0.96	UJ		0.48					0.48	0.30	0.48	0.39
Nitroaniline (3-)	NS	**1.1**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Nitroaniline (4-)	NS	**3.2**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Nitrobenzene	NS	**0.34**	*200*	NS	0.60	UJ		0.30	0.96	UJ		0.48					0.48	0.30	0.48	0.39
Nitrophenol (2-)	NS	NS	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Nitrophenol (4-)	NS	NS	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Nitroso-di-n-propylamine (N-)	NS	**0.0096**	NS	NS	0.60	UJ		0.30	0.96	UJ		0.48					0.48	0.30	0.48	0.39
Nitrosodiphenylamine (N-)	NS	**14**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Pentachlorophenol	1	**0.56**	NS	1.0	0.60	UJ		0.30	0.96	UJ		0.48					0.48	0.30	0.48	0.39
Phenol	NS	**1,100**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Trichlorobenzene (1,2,4-)	NS	**0.72**	*340*	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Trichlorophenol (2,4,5-)	NS	**360**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Trichlorophenol (2,4,6-)	NS	**0.36**	NS	NS	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Total Phenols	NS	NS	NS	300	1.1			1.1	-			-					1.10	1.10	-	1.10
Total Other SVOCs	NS	NS	NS	NS	14.78			14.78	1.1			1.1	-			-	14.78	1.10	1.10	7.94
Total SVOCs	NS	NS	NS	NS	63.916			63.916	43.852			43.852	53.21			53.21	63.92	43.85	43.85	53.66

Analytes	SH-16S															
	9/11/2001				5/17/2002				11/19/2003				SH-16S Summary			
	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
PAHs																
Acenaphthene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Acenaphthylene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Anthracene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Benzo(a)anthracene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Benzo(a)pyrene	0.0029	UJ		0.0015	0.0018	UJ		0.0009	0.0031	UJ		0.0016	0.00	0.00	0.00	0.00
Benzo(b)fluoranthene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Benzo(g,h,i)perylene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Benzo(k)fluoranthene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Chrysene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Dibenz(a,h)anthracene	0.0044	UJ		0.0022	0.0026	UJ		0.0013	0.0022	UJ		0.0011	0.00	0.00	0.00	0.00
Fluoranthene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Fluorene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Indeno(1,2,3-cd)pyrene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Methylnaphthalene (2-)	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Naphthalene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Phenanthrene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Pyrene	0.051	U		0.026	0.052	U		0.026	0.053	U		0.027	0.03	0.03	0.03	0.03
Group I PAHs	-			-	-			-	-			-	-	-	-	-
Group II PAHs	-			-	-			-	-			-	-	-	-	-
Total PAHs	-			-	-			-	-			-	-	-	-	-
Other SVOCs																
Benzoic acid		R				R							0.00	0.00	0.00	0.00
Benzyl Alcohol	2.0	U		1.0	5.2	UJ	L	2.6					2.60	1.00	2.60	1.80
bis(2-Chloroethoxy)methane	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
bis(2-Chloroethyl)ether	0.60	UJ		0.30	0.97	UJ		0.49					0.49	0.30	0.49	0.39
bis(2-Chloroisopropyl)ether	0.60	UJ		0.30	0.97	UJ		0.49					0.49	0.30	0.49	0.39
bis(2-Ethylhexyl)phthalate	0.60	UJ		0.30	0.97	UJ		0.49	0.53	U		0.27	0.49	0.27	0.27	0.35
Bromophenyl-phenylether (4-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Butylbenzylphthalate	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Carbazole	0.60	UJ		0.30	0.97	UJ		0.49	0.53	U		0.27	0.49	0.27	0.27	0.35
Chloro-3-methylphenol (4-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Chloroaniline (4-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Chloronaphthalene (2-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Chlorophenol (2-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Chlorophenyl-phenylether (4-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dibenzofuran	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dichlorobenzene (1,2-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dichlorobenzene (1,3-)	0.60	UJ		0.30	0.97	UJ		0.49					0.49	0.30	0.49	0.39
Dichlorobenzene (1,4-)	0.60	UJ		0.30	0.97	UJ		0.49					0.49	0.30	0.49	0.39
Dichlorobenzidine (3,3'-)	0.60	UJ		0.30	4.1	UJ		2.1					2.05	0.30	2.05	1.18
Dichlorophenol (2,4-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Diethylphthalate	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dimethylphenol (2,4-)	2.0	U		1.0	5.2	U		2.6					2.60	1.00	2.60	1.80
Dimethylphthalate	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Di-n-butylphthalate	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dinitro-2-methylphenol (4,6-)	5.1	U		2.6	5.2	U		2.6					2.60	2.55	2.60	2.58
Dinitrophenol (2,4-)	2.0	UJ	I	1.0	5.2	UJ	I	2.6					2.60	1.00	2.60	1.80
Dinitrotoluene (2,4-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Dinitrotoluene (2,6-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Di-n-octylphthalate	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Hexachlorobenzene $	0.60	UJ		0.30	0.97	UJ		0.49					0.49	0.30	0.49	0.39
Hexachlorobutadiene	0.60	UJ		0.30	0.97	UJ		0.49					0.49	0.30	0.49	0.39
Hexachlorocyclopentadiene $	5.1	U		2.6	2.1	U		1.1					2.55	1.05	1.05	1.80
Hexachloroethane	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Isophorone	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Methylphenol (2-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Methylphenol (4-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Nitroaniline (2-)	0.60	UJ		0.30	0.97	UJ		0.49					0.49	0.30	0.49	0.39
Nitroaniline (3-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Nitroaniline (4-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Nitrobenzene	0.60	UJ		0.30	0.97	UJ		0.49					0.49	0.30	0.49	0.39
Nitrophenol (2-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Nitrophenol (4-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Nitroso-di-n-propylamine (N-)	0.60	UJ		0.30	0.97	UJ		0.49					0.49	0.30	0.49	0.39
Nitrosodiphenylamine (N-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Pentachlorophenol	0.60	UJ		0.30	0.97	UJ		0.49					0.49	0.30	0.49	0.39
Phenol	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Trichlorobenzene (1,2,4-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Trichlorophenol (2,4,5-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Trichlorophenol (2,4,6-)	2.0	U		1.0	2.1	U		1.1					1.05	1.00	1.05	1.03
Total Phenols	-			-	-			-	-			-	-	-	-	-
Total Other SVOCs	-			-	-			-	-			-	-	-	-	-
Total SVOCs	-			-	-			-	-			-	-	-	-	-

TABLE C-2.3
Summary of Groundwater Data - Semi-Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l																			
					SH-05D																			
					9/11/2001				5/21/2002				11/4/2003				10/2/2006				SH-05D Summary			
	EPA MCLs	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening Values		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
PAHs																								
Acenaphthene	NS	**37**	NS	Group II	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Acenaphthylene	NS	NS	NS	Group II	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Anthracene	NS	**180**	NS	Group II	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Benzo(a)anthracene	NS	**0.092**	NS	0.0038 & Group I	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Benzo(a)pyrene	0.2	**0.0092**	NS	0.0038 & Group I	0.0030	UJ		0.0015	0.0019	UJ		0.0010	0.0031	UJ		0.0016	0.010	U		0.005	0.005	0.001	0.005	0.002
Benzo(b)fluoranthene	NS	**0.092**	NS	0.0038 & Group I	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Benzo(g,h,i)perylene	NS	NS	NS	Group II	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Benzo(k)fluoranthene	NS	**0.92**	NS	0.0038 & Group I	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Chrysene	NS	**9.2**	NS	0.0038 & Group I	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Dibenz(a,h)anthracene	NS	**0.0092**	NS	0.0038 & Group I	0.0046	UJ		0.0023	0.0038	J		0.0038	0.0022	UJ		0.0011	0.010	U		0.005	0.005	0.001	0.005	0.003
Fluoranthene	NS	**150**	NS	Group II	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Fluorene	NS	**24**	NS	Group II	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Indeno(1,2,3-cd)pyrene	NS	**0.092**	NS	0.0038 & Group I	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Methylnaphthalene (2-)	NS	NS	*330*	NS	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Naphthalene	NS	**0.62**	*15*	20 & Group II	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Phenanthrene	NS	NS	NS	Group II	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Pyrene	NS	**18**	NS	Group II	0.053	U		0.027	0.057	U		0.029	0.053	U		0.027	0.010	U		0.005	0.029	0.005	0.005	0.022
Group I PAHs	NS	NS	NS	10.0	-			-	0.0038			0.0038	-			-	-			-	0.004	0.004	-	0.004
Group II PAHs	NS	NS	NS	100	-			-	-			-	-			-	-			-	-	-	-	-
Total PAHs	NS	NS	NS	NS	-			-	0.0038			0.0038	-			-	-			-	0.004	0.004	-	0.004
Other SVOCs																								
Benzoic acid	NS	**15,000**	NS	NS		R				R											0.00	0.00	0.00	0.00
Benzyl Alcohol	NS	**1,100**	NS	NS	2.1	U		1.1	5.7	UJ	L	2.9									2.85	1.05	2.85	1.95
bis(2-Chloroethoxy)methane	NS	NS	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
bis(2-Chloroethyl)ether	NS	**0.01**	*10*	NS	0.63	UJ		0.32	1.1	UJ		0.6									0.55	0.32	0.55	0.43
bis(2-Chloroisopropyl)ether	NS	**0.27**	*51*	NS	0.63	UJ		0.32	1.1	UJ		0.6									0.55	0.32	0.55	0.43
bis(2-Ethylhexyl)phthalate	6	**4.8**	NS	6.0	0.63	UJ		0.32	1.1	UJ		0.6	0.71	U		0.36	1.0	U		0.5	0.55	0.32	0.50	0.43
Bromophenyl-phenylether (4-)	NS	NS	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Butylbenzylphthalate	NS	**730**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Carbazole	NS	**3.4**	NS	NS	0.63	UJ		0.32	1.1	UJ		0.6	0.53	U		0.27	0.010	U		0.005	0.55	0.01	0.01	0.28
Chloro-3-methylphenol (4-)	NS	NS	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Chloroaniline (4-)	NS	**15**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Chloronaphthalene (2-)	NS	**49**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Chlorophenol (2-)	NS	**3.0**	*110*	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Chlorophenyl-phenylether (4-)	NS	NS	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Dibenzofuran	NS	**1.2**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Dichlorobenzene (1,2-)	600	**37**	*260*	600	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Dichlorobenzene (1,3-)	NS	**18**	*83*	320	0.63	UJ		0.32	1.1	UJ		0.6									0.55	0.32	0.55	0.43
Dichlorobenzene (1,4-)	75	**0.50**	*820*	5.0	0.63	UJ		0.32	1.1	UJ		0.6									0.55	0.32	0.55	0.43
Dichlorobenzidine (3,3'-)	NS	**0.15**	NS	NS	0.63	UJ		0.32	4.5	UJ		2.3									2.25	0.32	2.25	1.28
Dichlorophenol (2,4-)	NS	**11**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Diethylphthalate	NS	**2,900**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Dimethylphenol (2,4-)	NS	**73**	NS	NS	2.1	U		1.1	5.7	U		2.9									2.85	1.05	2.85	1.95
Dimethylphthalate	NS	**36,000**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Di-n-butylphthalate	NS	**360**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Dinitro-2-methylphenol (4,6-)	NS	**0.36**	NS	NS	5.3	U		2.7	5.7	U		2.9									2.85	2.65	2.85	2.75
Dinitrophenol (2,4-)	NS	**7.3**	NS	NS	2.1	UJ	I	1.1	5.7	UJ	I	2.9									2.85	1.05	2.85	1.95
Dinitrotoluene (2,4-)	NS	**7.3**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Dinitrotoluene (2,6-)	NS	**3.6**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Di-n-octylphthalate	NS	**150**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Hexachlorobenzene $	1	**0.042**	*1*	NS	0.63	UJ		0.32	1.1	UJ		0.6									0.55	0.32	0.55	0.43
Hexachlorobutadiene	NS	**0.86**	*0.33*	NS	0.63	UJ		0.32	1.1	UJ		0.6									0.55	0.32	0.55	0.43
Hexachlorocyclopentadiene $	50	**22**	*50*	NS	5.3	U		2.7	2.3	U		1.2									2.65	1.15	1.15	1.90
Hexachloroethane	NS	**3.6**	*3.8*	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Isophorone	NS	**71**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Methylphenol (2-)	NS	**180**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Methylphenol (4-)	NS	**18**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Nitroaniline (2-)	NS	**11**	NS	NS	0.63	UJ		0.32	1.1	UJ		0.6									0.55	0.32	0.55	0.43
Nitroaniline (3-)	NS	**1.1**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Nitroaniline (4-)	NS	**3.2**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Nitrobenzene	NS	**0.34**	*200*	NS	0.63	UJ		0.32	1.1	UJ		0.6									0.55	0.32	0.55	0.43
Nitrophenol (2-)	NS	NS	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Nitrophenol (4-)	NS	NS	NS	NS	2.1	UJ	L	1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Nitroso-di-n-propylamine (N-)	NS	**0.0096**	NS	NS	0.63	UJ		0.32	1.1	UJ		0.6									0.55	0.32	0.55	0.43
Nitrosodiphenylamine (N-)	NS	**14**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Pentachlorophenol	1	**0.56**	NS	1.0	0.63	UJ		0.32	1.1	UJ		0.6									0.55	0.32	0.55	0.43
Phenol	NS	**1,100**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Trichlorobenzene (1,2,4-)	NS	**0.72**	*340*	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Trichlorophenol (2,4,5-)	NS	**360**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Trichlorophenol (2,4,6-)	NS	**0.36**	NS	NS	2.1	U		1.1	2.3	U		1.2									1.15	1.05	1.15	1.10
Total Phenols	NS	NS	NS	300	-			-	-			-	-			-	-			-	-	-	-	-
Total Other SVOCs	NS	NS	NS	NS	-			-	-			-	-			-	-			-	-	-	-	-
Total SVOCs	NS	NS	NS	NS	-			-	0.0038			0.0038	-			-	-			-	0.0038	0.0038	0.0038	0.0038

TABLE C-2.3
Summary of Groundwater Data - Semi-Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l															
					SH-06D															
	EPA MCLs	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening Values		9/6/2001				5/22/2002				10/29/2003				SH-06D Summary			
					Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
PAHs																				
Acenaphthene	NS	**37**	NS	Group II	5.1			5.1	6.1			6.1	8.2			8.2	8.20	5.10	8.20	6.47
Acenaphthylene	NS	NS	NS	Group II	4.4			4.4	4.0			4.0	6.4			6.4	6.40	4.00	6.40	4.93
Anthracene	NS	**180**	NS	Group II	1.4			1.4	2.4			2.4	4.1			4.1	4.10	1.40	4.10	2.63
Benzo(a)anthracene	NS	**0.092**	NS	0.0038 & Group I	**0.44**			**0.44**	**0.83**			**0.83**	**1.1**			**1.1**	1.10	0.44	1.10	0.79
Benzo(a)pyrene	0.2	**0.0092**	NS	0.0038 & Group I	**0.32**			**0.32**	**0.45**			**0.45**	**0.72**			**0.72**	0.72	0.32	0.72	0.50
Benzo(b)fluoranthene	NS	**0.092**	NS	0.0038 & Group I	**0.26**			**0.26**	**0.23**			**0.23**	0.54	U		0.27	0.27	0.23	0.27	0.25
Benzo(g,h,i)perylene	NS	NS	NS	Group II	0.075			0.075	0.15			0.15	0.54	U		0.27	0.27	0.08	0.27	0.17
Benzo(k)fluoranthene	NS	**0.92**	NS	0.0038 & Group I	0.12			0.12	0.24			0.24	0.54	U		0.27	0.27	0.12	0.27	0.21
Chrysene	NS	**9.2**	NS	0.0038 & Group I	0.43			0.43	0.67			0.67	1.2			1.2	1.20	0.43	1.20	0.77
Dibenz(a,h)anthracene	NS	**0.0092**	NS	0.0038 & Group I	**0.020**	J		**0.020**	**0.048**	J		**0.048**	**0.074**	J	I	**0.074**	0.07	0.02	0.07	0.05
Fluoranthene	NS	**150**	NS	Group II	2.3			2.3	3.1			3.1	4.8			4.8	4.80	2.30	4.80	3.40
Fluorene	NS	**24**	NS	Group II	4.9			4.9	6.4			6.4	9.8			9.8	9.80	4.90	9.80	7.03
Indeno(1,2,3-cd)pyrene	NS	**0.092**	NS	0.0038 & Group I	0.058			0.058	**0.12**			**0.12**	0.54	U		0.27	0.27	0.06	0.27	0.15
Methylnaphthalene (2-)	NS	NS	*330*	NS	26			26	21			21	42			42	42.00	21.00	42.00	29.67
Naphthalene	NS	**0.62**	*15*	20 & Group II	**140**			**140**	**100**			**100**	**150**			**150**	150.00	100.00	150.00	130.00
Phenanthrene	NS	NS	NS	Group II	12			12	16			16	33			33	33.00	12.00	33.00	20.33
Pyrene	NS	**18**	NS	Group II	2.5			2.5	4.2			4.2	8.2			8.2	8.20	2.50	8.20	4.97
Group I PAHs	NS	NS	NS	10.0	1.648			1.648	2.59			2.59	3.094			3.094	3.09	1.65	3.09	2.44
Group II PAHs	NS	NS	NS	100	172.675			172.675	142.35			142.35	224.5			224.5	224.50	142.35	224.50	179.84
Total PAHs	NS	NS	NS	NS	200.323			200.323	165.938			165.938	269.594			269.594	269.59	165.94	269.59	211.95
Other SVOCs																				
Benzoic acid	NS	**15,000**	NS	NS	13	J	L	13	5.4	J	L	5.4					13.00	5.40	5.40	0.00
Benzyl Alcohol	NS	**1,100**	NS	NS	10	U		5	5.0	UJ	L	2.5					5.00	2.50	2.50	3.75
bis(2-Chloroethoxy)methane	NS	NS	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
bis(2-Chloroethyl)ether	NS	**0.01**	*10*	NS	3.0	UJ		1.5	0.93	UJ		0.47					1.50	0.47	0.47	0.98
bis(2-Chloroisopropyl)ether	NS	**0.27**	*51*	NS	3.0	UJ		1.5	0.93	UJ		0.47					1.50	0.47	0.47	0.98
bis(2-Ethylhexyl)phthalate	6	**4.8**	NS	6.0	3.0	UJ	I	1.5	1.1	J		1.1	5.4	U		2.7	2.70	1.10	2.70	1.77
Bromophenyl-phenylether (4-)	NS	NS	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Butylbenzylphthalate	NS	**730**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Carbazole	NS	**3.4**	NS	NS	3.0	UJ		1.5	1.0	J		1.0	5.4	U		2.7	2.70	1.00	2.70	1.73
Chloro-3-methylphenol (4-)	NS	NS	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Chloroaniline (4-)	NS	**15**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Chloronaphthalene (2-)	NS	**49**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Chlorophenol (2-)	NS	**3.0**	*110*	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Chlorophenyl-phenylether (4-)	NS	NS	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Dibenzofuran	NS	**1.2**	NS	NS	10	U		5	1.1	J		1.1					5.00	1.10	1.10	3.05
Dichlorobenzene (1,2-)	600	**37**	*260*	600	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Dichlorobenzene (1,3-)	NS	**18**	*83*	320	3.0	UJ		1.5	0.93	UJ		0.47					1.50	0.47	0.47	0.98
Dichlorobenzene (1,4-)	75	**0.50**	*820*	5.0	3.0	UJ		1.5	0.93	UJ		0.47					1.50	0.47	0.47	0.98
Dichlorobenzidine (3,3'-)	NS	**0.15**	NS	NS	3.0	UJ		1.5	4.0	UJ		2.0					2.00	1.50	2.00	1.75
Dichlorophenol (2,4-)	NS	**11**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Diethylphthalate	NS	**2,900**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Dimethylphenol (2,4-)	NS	**73**	NS	NS	7.4	J		7.4	3.0	J		3.0					7.40	3.00	3.00	5.20
Dimethylphthalate	NS	**36,000**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Di-n-butylphthalate	NS	**360**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Dinitro-2-methylphenol (4,6-)	NS	**0.36**	NS	NS	25	U		12.5	5.0	U		2.5					12.50	2.50	2.50	7.50
Dinitrophenol (2,4-)	NS	**7.3**	NS	NS	10	UJ	I	5	5.0	UJ	I	2.5					5.00	2.50	2.50	3.75
Dinitrotoluene (2,4-)	NS	**7.3**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Dinitrotoluene (2,6-)	NS	**3.6**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Di-n-octylphthalate	NS	**150**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Hexachlorobenzene $	1	**0.042**	*1*	NS	3.0	UJ		1.5	0.93	UJ		0.47					1.50	0.47	0.47	0.98
Hexachlorobutadiene	NS	**0.86**	*0.33*	NS	3.0	UJ		1.5	0.93	UJ		0.47					1.50	0.47	0.47	0.98
Hexachlorocyclopentadiene $	50	**22**	*50*	NS	25	U		12.5	2.0	U		1.0					12.50	1.00	1.00	6.75
Hexachloroethane	NS	**3.6**	*3.8*	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Isophorone	NS	**71**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Methylphenol (2-)	NS	**180**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Methylphenol (4-)	NS	**18**	NS	NS	7.7	J		7.7	5.3			5.3					7.70	5.30	5.30	6.50
Nitroaniline (2-)	NS	**11**	NS	NS	3.0	UJ		1.5	0.93	UJ		0.47					1.50	0.47	0.47	0.98
Nitroaniline (3-)	NS	**1.1**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Nitroaniline (4-)	NS	**3.2**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Nitrobenzene	NS	**0.34**	*200*	NS	3.0	UJ		1.5	0.93	UJ		0.47					1.50	0.47	0.47	0.98
Nitrophenol (2-)	NS	NS	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Nitrophenol (4-)	NS	NS	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Nitroso-di-n-propylamine (N-)	NS	**0.0096**	NS	NS	3.0	UJ		1.5	0.93	UJ		0.47					1.50	0.47	0.47	0.98
Nitrosodiphenylamine (N-)	NS	**14**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Pentachlorophenol	1	**0.56**	NS	1.0	3.0	UJ		1.5	0.93	UJ		0.47					1.50	0.47	0.47	0.98
Phenol	NS	**1,100**	NS	NS	3.8	J		3.8	2.0	U		1.0					3.80	1.00	1.00	2.40
Trichlorobenzene (1,2,4-)	NS	**0.72**	*340*	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Trichlorophenol (2,4,5-)	NS	**360**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Trichlorophenol (2,4,6-)	NS	**0.36**	NS	NS	10	U		5	2.0	U		1.0					5.00	1.00	1.00	3.00
Total Phenols	NS	NS	NS	300	18.9			18.9	8.3			8.3					18.90	8.30	8.30	13.60
Total Other SVOCs	NS	NS	NS	NS	31.9			31.9	16.9			16.9	-			-	31.90	16.90	16.90	24.40
Total SVOCs	NS	NS	NS	NS	232.223			232.223	182.838			182.838	269.594			269.594	269.59	182.84	182.84	228.22

TABLE C-2.3
Summary of Groundwater Data - Semi-Volatile Organic Compounds
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l								Concentrations in µg/l			
					Shallow Well Summary				Deep Well Summary				Estimated Influent Conc			
	EPA MCLs	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening Values		Maximum	Minimum	Most Recent	Mean	Maximum	Minimum	Most Recent	Mean	Maximum	Minimum	Most Recent	Mean
PAHs																
Acenaphthene	NS	**37**	NS	Group II	8.61	3.38	4.11	5.58	4.11	2.55	4.10	3.24	8.16	3.30	4.11	5.35
Acenaphthylene	NS	NS	NS	Group II	3.21	0.94	1.11	1.96	3.21	2.00	3.20	2.48	3.21	1.05	1.32	2.01
Anthracene	NS	**180**	NS	Group II	1.98	0.65	0.73	1.24	2.06	0.70	2.05	1.33	1.99	0.65	0.86	1.24
Benzo(a)anthracene	NS	**0.092**	NS	0.0038 & Group I	0.37	0.11	0.13	0.24	0.56	0.22	0.55	0.41	0.39	0.12	0.17	0.26
Benzo(a)pyrene	0.2	**0.0092**	NS	0.0038 & Group I	0.24	0.05	0.07	0.14	0.36	0.16	0.36	0.25	0.25	0.07	0.10	0.15
Benzo(b)fluoranthene	NS	**0.092**	NS	0.0038 & Group I	0.23	0.05	0.06	0.13	0.15	0.12	0.14	0.14	0.22	0.06	0.07	0.13
Benzo(g,h,i)perylene	NS	NS	NS	Group II	0.23	0.04	0.05	0.12	0.15	0.04	0.14	0.09	0.22	0.04	0.06	0.12
Benzo(k)fluoranthene	NS	**0.92**	NS	0.0038 & Group I	0.23	0.04	0.06	0.12	0.15	0.06	0.14	0.12	0.22	0.04	0.07	0.12
Chrysene	NS	**9.2**	NS	0.0038 & Group I	0.34	0.11	0.12	0.23	0.61	0.22	0.60	0.39	0.37	0.12	0.17	0.24
Dibenz(a,h)anthracene	NS	**0.0092**	NS	0.0038 & Group I	0.05	0.01	0.01	0.02	0.04	0.01	0.04	0.03	0.05	0.01	0.01	0.02
Fluoranthene	NS	**150**	NS	Group II	1.55	0.44	0.63	0.96	2.41	1.15	2.40	1.71	1.64	0.51	0.81	1.03
Fluorene	NS	**24**	NS	Group II	5.73	2.51	3.41	4.04	4.91	2.45	4.90	3.53	5.65	2.50	3.56	3.98
Indeno(1,2,3-cd)pyrene	NS	**0.092**	NS	0.0038 & Group I	0.23	0.03	0.05	0.11	0.15	0.03	0.14	0.09	0.22	0.03	0.06	0.11
Methylnaphthalene (2-)	NS	NS	*330*	NS	34.33	8.81	10.78	20.10	21.01	10.50	21.00	14.84	33.00	8.98	11.80	19.57
Naphthalene	NS	**0.62**	*15*	20 & Group II	104.51	31.51	37.26	65.30	75.01	50.00	75.00	65.01	101.56	33.36	41.03	65.27
Phenanthrene	NS	NS	NS	Group II	12.31	4.41	5.63	7.84	16.51	6.00	16.50	10.18	12.73	4.57	6.72	8.08
Pyrene	NS	**18**	NS	Group II	1.88	0.56	0.81	1.22	4.11	1.25	4.10	2.49	2.10	0.63	1.14	1.35
Group I PAHs	NS	NS	NS	10.0	1.48	0.12	0.43	0.77	1.55	0.83	3.09	1.22	1.49	0.19	0.70	0.82
Group II PAHs	NS	NS	NS	100	186.00	59.44	71.54	116.76	224.50	142.35	224.50	179.84	189.85	67.73	86.84	123.07
Total PAHs	NS	NS	NS	NS	232.83	72.11	86.86	145.16	134.80	82.97	269.59	105.98	223.02	73.20	105.14	141.24
Other SVOCs																
Benzoic acid	NS	**15,000**	NS	NS	1.20	1.18	1.20	1.19	6.50	2.70	2.70	0.00	1.73	1.33	1.35	1.07
Benzyl Alcohol	NS	**1,100**	NS	NS	4.85	1.80	2.60	3.33	3.93	1.78	2.68	2.85	4.76	1.80	2.61	3.28
bis(2-Chloroethoxy)methane	NS	NS	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
bis(2-Chloroethyl)ether	NS	**0.01**	*10*	NS	1.30	0.39	0.48	0.85	1.03	0.39	0.51	0.71	1.28	0.39	0.49	0.83
bis(2-Chloroisopropyl)ether	NS	**0.27**	*51*	NS	1.30	0.39	0.48	0.85	1.03	0.39	0.51	0.71	1.28	0.39	0.49	0.83
bis(2-Ethylhexyl)phthalate	6	**4.8**	NS	6.0	5.02	0.43	0.60	2.09	1.63	0.71	1.60	1.10	4.68	0.46	0.70	1.99
Bromophenyl-phenylether (4-)	NS	NS	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Butylbenzylphthalate	NS	**730**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Carbazole	NS	**3.4**	NS	NS	2.31	0.58	0.75	1.28	1.63	0.50	1.35	1.01	2.24	0.57	0.81	1.25
Chloro-3-methylphenol (4-)	NS	NS	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Chloroaniline (4-)	NS	**15**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Chloronaphthalene (2-)	NS	**49**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Chlorophenol (2-)	NS	**3.0**	*110*	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Chlorophenyl-phenylether (4-)	NS	NS	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Dibenzofuran	NS	**1.2**	NS	NS	4.08	1.04	1.06	2.56	3.08	1.08	1.13	2.08	3.98	1.04	1.07	2.51
Dichlorobenzene (1,2-)	600	**37**	*260*	600	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Dichlorobenzene (1,3-)	NS	**18**	*83*	320	1.30	0.39	0.48	0.85	1.03	0.39	0.51	0.71	1.28	0.39	0.49	0.83
Dichlorobenzene (1,4-)	75	**0.50**	*820*	5.0	1.30	0.39	0.48	0.85	1.03	0.39	0.51	0.71	1.28	0.39	0.49	0.83
Dichlorobenzidine (3,3'-)	NS	**0.15**	NS	NS	2.29	0.98	2.05	1.63	2.13	0.91	2.13	1.52	2.27	0.97	2.06	1.62
Dichlorophenol (2,4-)	NS	**11**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Diethylphthalate	NS	**2,900**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Dimethylphenol (2,4-)	NS	**73**	NS	NS	4.65	1.85	2.65	3.25	5.13	2.03	2.93	3.58	4.70	1.87	2.68	3.28
Dimethylphthalate	NS	**36,000**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Di-n-butylphthalate	NS	**360**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Dinitro-2-methylphenol (4,6-)	NS	**0.36**	NS	NS	10.30	2.56	2.60	6.43	7.68	2.58	2.68	5.13	10.04	2.56	2.61	6.30
Dinitrophenol (2,4-)	NS	**7.3**	NS	NS	4.85	1.80	2.60	3.33	3.93	1.78	2.68	2.85	4.76	1.80	2.61	3.28
Dinitrotoluene (2,4-)	NS	**7.3**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Dinitrotoluene (2,6-)	NS	**3.6**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Di-n-octylphthalate	NS	**150**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Hexachlorobenzene $	1	**0.042**	*1*	NS	1.30	0.39	0.48	0.85	1.03	0.39	0.51	0.71	1.28	0.39	0.49	0.83
Hexachlorobutadiene	NS	**0.86**	*0.33*	NS	1.30	0.39	0.48	0.85	1.03	0.39	0.51	0.71	1.28	0.39	0.49	0.83
Hexachlorocyclopentadiene $	50	**22**	*50*	NS	10.26	1.05	1.05	5.66	7.58	1.08	1.08	4.33	9.99	1.05	1.05	5.52
Hexachloroethane	NS	**3.6**	*3.8*	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Isophorone	NS	**71**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Methylphenol (2-)	NS	**180**	NS	NS	4.08	1.11	1.14	2.59	3.08	1.03	1.08	2.05	3.98	1.10	1.13	2.54
Methylphenol (4-)	NS	**18**	NS	NS	3.71	2.14	2.15	2.93	4.43	3.18	3.23	3.80	3.78	2.24	2.26	3.01
Nitroaniline (2-)	NS	**11**	NS	NS	1.30	0.39	0.48	0.85	1.03	0.39	0.51	0.71	1.28	0.39	0.49	0.83
Nitroaniline (3-)	NS	**1.1**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Nitroaniline (4-)	NS	**3.2**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Nitrobenzene	NS	**0.34**	*200*	NS	1.30	0.39	0.48	0.85	1.03	0.39	0.51	0.71	1.28	0.39	0.49	0.83
Nitrophenol (2-)	NS	NS	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Nitrophenol (4-)	NS	NS	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Nitroso-di-n-propylamine (N-)	NS	**0.0096**	NS	NS	1.30	0.39	0.48	0.85	1.03	0.39	0.51	0.71	1.28	0.39	0.49	0.83
Nitrosodiphenylamine (N-)	NS	**14**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Pentachlorophenol	1	**0.56**	NS	1.0	1.30	0.39	0.48	0.85	1.03	0.39	0.51	0.71	1.28	0.39	0.49	0.83
Phenol	NS	**1,100**	NS	NS	4.08	1.03	1.05	2.55	2.48	1.03	1.08	1.75	3.92	1.03	1.05	2.47
Trichlorobenzene (1,2,4-)	NS	**0.72**	*340*	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Trichlorophenol (2,4,5-)	NS	**360**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Trichlorophenol (2,4,6-)	NS	**0.36**	NS	NS	4.08	1.03	1.05	2.55	3.08	1.03	1.08	2.05	3.98	1.03	1.05	2.50
Total Phenols	NS	NS	NS	300	7.07	4.80	6.65	5.93	18.90	8.30	8.30	13.60	8.25	5.15	6.82	6.70
Total Other SVOCs	NS	NS	NS	NS	12.36	0.89	7.23	7.37	31.90	16.90	16.90	24.40	14.31	2.49	8.20	9.08
Total SVOCs	NS	NS	NS	NS	242.30	72.76	128.62	150.24	134.80	91.42	91.42	114.11	231.55	74.62	124.90	146.63

TABLE C-2.4
Summary of Groundwater Data - Inorganic Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Concentrations in µg/l (except as noted)																							
	COPC Screening Levels			RGP Effluent Criteria	SH-04S																			
					9/11/2001				5/20/2002				10/28/2003				10/4/2006				SH-04S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Metals																								
Aluminum	NS	**3,600**	NS	NS	1,120			1,120	480			480	500	U		250	380			380	1120	250	380	557.5
Antimony	6	**1.5**	NS	5.60	11.1	U		5.6	1.1			1.1	1.2			1.2	0.74			0.74	5.55	0.74	0.74	2.1475
Arsenic	10	**0.045**	NS	10.00	**61.4**			**61.4**	**38.0**			**38.0**	**35.0**			**35.0**	**17.0**			**17.0**	61.4	17	17	37.9
Barium	2,000	**260**	NS	NS	9.7	J	I	9.7	11.0			11.0	17.0			17.0	17.0			17.0	17.0	9.7	17	13.7
Beryllium	4	**7.3**	NS	NS	1.1	U		0.6	0.56	U		0.28	1.0	U		0.5	0.20	U		0.10	0.55	0.1	0.1	0.36
Cadmium	5	**1.8**	NS	0.20	1.1	U		0.6	0.11	U		0.06	1.0	U		0.5	0.10	U		0.05	0.55	0.05	0.05	0.29
Calcium	NS	NS	NS	NS	6,850	U		3,425	12,000			12,000	10,000			10,000	6,800	J	L	6,800	12,000	3,425	6,800	8,056
Chromium[%]	100	**11**	NS	48.8/11.4	9.6	J	I	9.6	3.4			3.4	3.1			3.1	5.0			5.0	9.6	3.1	5	5.3
Cobalt	NS	**73**	NS	NS	1.7			1.7	0.87			0.87	1.3			1.3	1.4			1.4	1.7	0.87	1.4	1.3175
Copper[&]	1,300	**150**	NS	5.2	19.9			19.9	10.0			10.0	8.8			8.8	17.0			17.0	19.9	8.8	17	13.9
Iron	NS	**1,100**	NS	1,000	**1,240**	J	L	**1,240**	760			760	**1,600**			**1,600**	**1,900**			**1,900**	1,900	760	1,900	1,375
Lead[&]	15	NS	NS	1.3	6.2	J	I	6.2	2.2	U		1.1	6.5			6.5	8.0			8.0	8.0	1.1	8	5.5
Magnesium	NS	NS	NS	NS	482	U		241	2,800			2,800	1,300	JB	H	1,300	560			560	2800	241	560	1225.25
Manganese	NS	**88**	NS	NS	57.6			57.6	69.0			69.0	79.0			79.0	73.0			73.0	79.0	57.6	73	69.7
Mercury	2	**1.1**	*0.068*	0.9	*0.20*			*0.20*	0.20	U		0.10	0.20	U		0.10	0.20	U		0.10	0.20	0.1	0.1	0.13
Nickel	NS	**73**	NS	29	47.8			47.8	24.0			24.0	24.0			24.0	10.0			10.0	47.8	10	10	26.5
Potassium	NS	NS	NS	NS	2,010	U		1,005	2,000			2,000	2,000	B	H	2,000	1,300	J	L	1,300	2,000	1,005	1,300	1,576
Selenium	50	**18**	NS	5	1.1	J	H	1.1	1.4			1.4	1.4			1.4	2.4			2.4	2.4	1.1	2.4	1.575
Silver	NS	**18**	NS	1.2	1.1	U		0.6	0.11	U		0.06	1.0	U		0.5	0.10	U		0.05	0.55	0.05	0.05	0.29
Sodium	NS	NS	NS	NS	899,000			899,000	560,000			560,000	710,000			710,000	390,000			390,000	899,000	390,000	390,000	639,750
Thallium	2	**0.24**	NS	NS	0.32	UJ	I	0.16	0.17	UJ	I	0.09	0.075	UJ	I	0.038	0.10	U		0.05	0.16	0.0375	0.05	0.08
Vanadium	NS	**3.6**	NS	NS	**140**	J	H	**140**	**78.0**			**78.0**	**84.0**	J	I	**84.0**	**36.0**	J	L	**36.0**	140.0	36	36	84.5
Zinc	NS	**1,100**	NS	66.6	19.5	U		9.8	11.0	U		5.5	10.0	U		5.0	6.9	U		3.45	9.75	3.45	3.45	5.925
Cyanide (weak acid dissociable)*	200	**0.62**	NS	5.2		R			5.0	U		2.5									2.5	2.5	2.5	2.5
Natural Attenuation Parameters																								
Alkalinity (mg/l)	NS	NS	NS		1,700			1,700	1,200			1,200	1,400			1,400	810			810	1700	810	810	1277.5
Chloride (mg/l)	NS	NS	NS		47.0			47.0	47.0			47.0	46.0			46.0	24.0			24.0	47.0	24	24	41.0
Ethane (µg/l)	NS	NS	NS														0.23			0.23	0.23	0.23	0.23	0.23
Ethene (µg/l)	NS	NS	NS														0.12			0.12	0.12	0.12	0.12	0.12
Iron, Ferrous (mg/l)	NS	NS	NS														1.0	UJ	L	0.5	0.5	0.5	0.5	0.5
Methane (µg/l)	NS	NS	NS														2,800			2,800	2,800	2800	2800	2,800
Nitrate (mg/l)	10,000	**10,000**	NS		0.10	U		0.05	0.10	U		0.05	0.050	U		0.025	0.50	U		0.25	0.25	0.025	0.25	0.09
Sulfate (mg/l)	NS	NS	NS		52.0			52.0	41.0			41.0	42.0			42.0	24.0			24.0	52.0	24.0	24	39.8
Sulfide (mg/l)	NS	NS	NS										0.27	J	L	0.27	0.35	J	H	0.35	0.35	0.27	0.35	0.31
Total Dissolved Solids (mg/l)	NS	NS	NS										2,200			2,200	1,300			1,300	2,200	1,300	1,300	1,750
TKN (mg/l)	NS	NS	NS		2.0	J	I	2.0	1.7			1.7	2.1			2.1	1.7			1.7	2.1	1.7	1.7	1.875
Total Organic Carbon (mg/l)	NS	NS	NS										15.0			15.0	18.0			18.0	18.0	15.0	18.0	16.5

TABLE C-2.4
Summary of Groundwater Data - Inorganic Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l (except as noted)																			
					SH-05S																			
					9/11/2001				5/21/2002				10/29/2003				10/4/2006				SH-05S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Metals																								
Aluminum	NS	**3,600**	NS	NS	1,190			1,190	490			490	500	U		250	840			840	1190	250	840	692.5
Antimony	6	**1.5**	NS	5.60	11.1	U		5.6	**2.8**			**2.8**	1.0	U		0.5	**2.2**			**2.2**	5.55	0.5	2.2	2.7625
Arsenic	10	**0.045**	NS	10.00	**27.3**			**27.3**	**21.0**			**21.0**	**6.4**			**6.4**	**11.0**			**11.0**	27.3	6.4	11	16.4
Barium	2,000	**260**	NS	NS	11.4	J	I	11.4	10.0			10.0	9.1			9.1	9.3			9.3	11.4	9.1	9.3	10.0
Beryllium	4	**7.3**	NS	NS	1.1	U		0.6	0.56	U		0.28	1.0	U		0.5	0.20	U		0.10	0.55	0.1	0.1	0.36
Cadmium	5	**1.8**	NS	0.20	1.1	U		0.6	0.11	U		0.06	1.0	U		0.5	0.15			0.15	0.55	0.055	0.15	0.31
Calcium	NS	NS	NS	NS	4,650	U		2,325	6,200			6,200	30,000			30,000	2,700	J	L	2,700	30,000	2,325	2,700	10,306
Chromium[%]	100	**11**	NS	48.8/11.4	5.9	J	I	5.9	5.2	J	I	5.2	2.5			2.5	5.4			5.4	5.9	2.5	5.4	4.8
Cobalt	NS	**73**	NS	NS	2.3			2.3	1.6			1.6	1.0	U		0.5	2.0			2.0	2.3	0.5	2	1.6
Copper[&]	1,300	**150**	NS	5.2	24.5			24.5	12.0			12.0	6.7			6.7	29.0			29.0	29.0	6.7	29	18.1
Iron	NS	**1,100**	NS	1,000	**2,080**	J	L	**2,080**	**1,200**			**1,200**	920			920	**2,100**			**2,100**	2,100	920	2,100	1,575
Lead[&]	15	NS	NS	1.3	25.7	J	I	25.7	23.0			23.0	12.0			12.0	26.0			26.0	26.0	12	26	21.7
Magnesium	NS	NS	NS	NS	562	U		281	2,200	U		1,100	5,300	J	H	5,300	410			410	5300	281	410	1772.75
Manganese	NS	**88**	NS	NS	**90.7**			**90.7**	**93.0**			**93.0**	**170**			**170**	**150**			**150**	170.0	90.7	150	125.9
Mercury	2	**1.1**	*0.068*	0.9	0.20	U		0.10	0.20	U		0.10	0.20	U		0.10	0.20	U		0.10	0.10	0.1	0.1	0.10
Nickel	NS	**73**	NS	29	21.2			21.2	15.0			15.0	10.0	U		5.0	8.3			8.3	21.2	5	8.3	12.4
Potassium	NS	NS	NS	NS	1,040	U		520	1,100	U		550	3,100			3,100	400	UJ	I	200	3,100	200	200	1,093
Selenium	50	**18**	NS	5	2.4	J	H	2.4	1.1	U		0.6	1.0	U		0.5	1.3			1.3	2.4	0.5	1.3	1.1875
Silver	NS	**18**	NS	1.2	1.1	U		0.6	0.11	U		0.06	1.0	U		0.5	0.13			0.13	0.55	0.055	0.13	0.31
Sodium	NS	NS	NS	NS	660,000			660,000	590,000			590,000	230,000			230,000	260,000			260,000	660,000	230,000	260,000	435,000
Thallium	2	**0.24**	NS	NS	0.32	UJ	I	0.16	0.21	J	I	0.21	0.075	UJ	I	0.038	0.10	U		0.05	0.21	0.0375	0.05	0.11
Vanadium	NS	**3.6**	NS	NS	**96.7**	J	H	**96.7**	**58.0**			**58.0**	**15.0**	J	I	**15.0**	**25.0**	J	L	**25.0**	96.7	15	25	48.7
Zinc	NS	**1,100**	NS	66.6	11.8	U		5.9	11.0	U		5.5	20.0			20.0	9.6	U		4.8	20	4.8	4.8	9.05
Cyanide (weak acid dissociable)*	200	**0.62**	NS	5.2		R			5.0	U		2.5									2.5	2.5	2.5	2.5
Natural Attenuation Parameters																								
Alkalinity (mg/l)	NS	NS	NS		1,200			1,200	1,200			1,200	540			540	610			610	1200	540	610	887.5
Chloride (mg/l)	NS	NS	NS		22.0			22.0	23.0			23.0	5.9			5.9	6.6			6.6	23.0	5.9	6.6	14.4
Ethane (µg/l)	NS	NS	NS														0.22	J	I	0.22	0.22	0.22	0.22	0.22
Ethene (µg/l)	NS	NS	NS														0.48	J	I	0.48	0.48	0.48	0.48	0.48
Iron, Ferrous (mg/l)	NS	NS	NS														1.0	UJ	L	0.5	0.5	0.5	0.5	0.5
Methane (µg/l)	NS	NS	NS														1,600			1,600	1,600	1600	1600	1,600
Nitrate (mg/l)	10,000	**10,000**	NS		0.10	U		0.05	0.10	U		0.05	0.050	U		0.025	0.50	U		0.25	0.25	0.025	0.25	0.09
Sulfate (mg/l)	NS	NS	NS		28.0			28.0	18.0			18.0	8.2			8.2	10.0			10.0	28.0	8.2	10	16.1
Sulfide (mg/l)	NS	NS	NS										0.20	UJ	L	0.1	0.20	U		0.10	0.1	0.10	0.1	0.1
Total Dissolved Solids (mg/l)	NS	NS	NS										730			730	870			870	870	730	870	800
TKN (mg/l)	NS	NS	NS		1.3	J	I	1.3	1.1			1.1	5.0	U		3	0.70			0.70	2.5	0.7	0.7	1.4
Total Organic Carbon (mg/l)	NS	NS	NS										9.9			9.9	7.2			7.2	9.9	7.2	7.2	8.6

TABLE C-2.4
Summary of Groundwater Data - Inorganic Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l (except as noted)															
					SH-06S															
					9/6/2001				5/22/2002				10/29/2003				SH-06S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Metals																				
Aluminum	NS	**3,600**	NS	NS	**10,200**			**10,200**	1,500	J	L	1,500	660			660	10,200	660	660	4120.0
Antimony	6	**1.5**	NS	5.60	11.1	U		5.6	**5.3**			**5.3**	**4.8**			**4.8**	5.55	4.8	4.8	5.22
Arsenic	10	**0.045**	NS	10.00	**14.2**			**14.2**	8.4	U		4.2	**7.7**			**7.7**	14.2	4.2	7.7	8.7
Barium	2,000	**260**	NS	NS	111			111	39.0	U		19.5	26.0			26.0	111.0	19.5	26	52.2
Beryllium	4	**7.3**	NS	NS	1.1	U		0.6	1.1	U		0.6	1.0	U		0.5	0.55	0.5	0.5	0.53
Cadmium	5	**1.8**	NS	0.20	1.1	U		0.6	0.20			0.20	1.0	U		0.5	0.55	0.2	0.5	0.42
Calcium	NS	NS	NS	NS	11,800			11,800	18,000	UJ	I	9,000	19,000			19,000	19,000	9,000	19,000	13,267
Chromium[%]	100	**11**	NS	48.8/11.4	**25.9**	J	I	**25.9**	10.0	J	I	10.0	7.0			7.0	25.9	7	7	14.3
Cobalt	NS	**73**	NS	NS	7.2			7.2	3.2	U		1.6	1.9			1.9	7.2	1.6	1.9	3.57
Copper[&]	1,300	**150**	NS	5.2	96.3			96.3	33.0			33.0	20.0			20.0	96.3	20	20	49.8
Iron	NS	**1,100**	NS	1,000	**8,290**			**8,290**	**2,100**	J	L	**2,100**	**1,800**			**1,800**	8,290	1800	1,800	4,063
Lead[&]	15	NS	NS	1.3	575			575	190			190	140			140	575.0	140	140	301.7
Magnesium	NS	NS	NS	NS	2,130			2,130	2,500	UJ	I	1,250	2,200	J	H	2,200	2200	1250	2200	1860
Manganese	NS	**88**	NS	NS	**241**			**241**	**320**			**320**	**120**			**120**	320.0	120.0	120	227.0
Mercury	2	**1.1**	*0.068*	0.9	0.20	U		0.10	0.20	U		0.10	0.20	U		0.10	0.10	0.1	0.1	0.10
Nickel	NS	**73**	NS	29	29.6	J	I	29.6	16.0	U		8.0	15.0			15.0	29.6	8	15	17.5
Potassium	NS	NS	NS	NS	4,620			4,620	4,300	U		2,150	6,300			6,300	6,300	2,150	6,300	4,357
Selenium	50	**18**	NS	5	2.4			2.4	2.4			2.4	1.2			1.2	2.4	1.2	1.2	2
Silver	NS	**18**	NS	1.2	1.1	U		0.6	0.13			0.13	1.0	U		0.5	0.55	0.13	0.5	0.39
Sodium	NS	NS	NS	NS	427,000			427,000	410,000			410,000	410,000			410,000	427,000	410,000	410,000	415,667
Thallium	2	**0.24**	NS	NS	0.32	UJ	I	0.16	0.17	UJ	I	0.09	0.075	UJ	I	0.038	0.16	0.0375	0.0375	0.09
Vanadium	NS	**3.6**	NS	NS	**68.5**			**68.5**	**28.0**			**28.0**	**30.0**	J	I	**30.0**	68.5	28	30	42.2
Zinc	NS	**1,100**	NS	66.6	182	UJ	I	91	79.0	U		39.5	42.0			42.0	91	39.5	42	57.5
Cyanide (weak acid dissociable)*	200	**0.62**	NS	5.2	5.0	U		2.5	5.0	U		2.5					2.5	2.5	2.5	2.5
Natural Attenuation Parameters																				
Alkalinity (mg/l)	NS	NS	NS		880			880	810			810	850			850	880	810	850	847
Chloride (mg/l)	NS	NS	NS		20.0			20.0	15.0	B	H	15.0	9.4			9.4	20.0	9.4	9.4	14.8
Ethane (µg/l)	NS	NS	NS																	
Ethene (µg/l)	NS	NS	NS																	
Iron, Ferrous (mg/l)	NS	NS	NS																	
Methane (µg/l)	NS	NS	NS																	
Nitrate (mg/l)	10,000	**10,000**	NS		0.10	U		0.05	0.10	U		0.05	0.050	U		0.025	0.05	0.025	0.025	0.04
Sulfate (mg/l)	NS	NS	NS		31.0			31.0	41.0	JB	I	41.0	30.0			30.0	41.0	30.0	30.0	34.0
Sulfide (mg/l)	NS	NS	NS										0.20	UJ	L	0.10	0.1	0.10	0.1	0.1
Total Dissolved Solids (mg/l)	NS	NS	NS										1,000			1,000	1,000	1,000	1,000	1,000
TKN (mg/l)	NS	NS	NS		4.2			4.2	5.9			5.9	4.1			4.1	5.9	4.1	4.1	4.73
Total Organic Carbon (mg/l)	NS	NS	NS										34.0			34.0	34.0	34.0	34.0	34.0

TABLE C-2.4
Summary of Groundwater Data - Inorganic Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Concentrations in µg/l (except as noted)																			
	COPC Screening Levels			RGP Effluent Criteria	SH-16S															
					9/11/2001				5/17/2002				11/19/2003				SH-16S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Metals																				
Aluminum	NS	**3,600**	NS	NS	1,210			1,210	1,700			1,700	630	J	L	630	1,700	630	630	1180.0
Antimony	6	**1.5**	NS	5.60	11.10	U		5.55	1.1	U		0.6	1.0	U		0.5	5.55	0.5	0.5	2.2
Arsenic	10	**0.045**	NS	10.00	**17.4**			**17.4**	**4.7**	J	I	**4.7**	**4.0**			**4.0**	17.4	4	4	8.7
Barium	2,000	**260**	NS	NS	10.6			10.6	9.1	U		4.6	7.7			7.7	10.6	4.55	7.7	7.6
Beryllium	4	**7.3**	NS	NS	1.1	U		0.6	0.56	U		0.28	1.0	U		0.5	0.55	0.28	0.5	0.44
Cadmium	5	**1.8**	NS	0.20	1.1	U		0.6	0.11	U		0.06	1.0	U		0.5	0.55	0.055	0.5	0.37
Calcium	NS	NS	NS	NS	5,170	J	H	5,170	1,200	U		600	3,200			3,200	5,170	600	3,200	2,990
Chromium[%]	100	**11**	NS	48.8/11.4	4.8	J	I	4.8	4.3			4.3	1.4			1.4	4.8	1.4	1.4	3.5
Cobalt	NS	**73**	NS	NS	1.3			1.3	0.70	U		0.35	1.0	U		0.5	1.3	0.35	0.5	0.72
Copper[&]	1,300	**150**	NS	5.2	15.1			15.1	7.3	U		3.7	12.0			12.0	15.1	3.65	12	10.3
Iron	NS	**1,100**	NS	1,000	961	U		481	730			730	500			500	730	480.5	500	570
Lead[&]	15	NS	NS	1.3	1.6			1.6	2.1	U		1.1	2.5			2.5	2.5	1.05	2.5	1.7
Magnesium	NS	NS	NS	NS	1,250			1,250	290	U		145	440	J	L	440	1250	145	440	611.67
Manganese	NS	**88**	NS	NS	**102**			**102**	16.0	U		8.0	24.0			24.0	102.0	8.0	24	44.7
Mercury	2	**1.1**	*0.068*	0.9	0.20	U		0.10	0.20	U		0.10	0.20	UJ	L	0.10	0.10	0.1	0.1	0.10
Nickel	NS	**73**	NS	29	5.5	J	I	5.5	2.7	U		1.4	10.0	U		5.0	5.5	1.35	5	4.0
Potassium	NS	NS	NS	NS	1,630			1,630	1,000	U		500	1,400	J	L	1,400	1,630	500	1,400	1,177
Selenium	50	**18**	NS	5	2.0			2.0	1.2			1.2	1.0	U		0.5	2	0.5	0.5	1.23
Silver	NS	**18**	NS	1.2	1.1	U		0.6	0.11	U		0.06	1.0	U		0.5	0.55	0.055	0.5	0.37
Sodium	NS	NS	NS	NS	169,000			169,000	110,000	U		55,000	190,000			190,000	190,000	55,000	190,000	138,000
Thallium	2	**0.24**	NS	NS	0.32	UJ	I	0.16	0.17	UJ	I	0.09	0.075	UJ	I	0.038	0.16	0.0375	0.0375	0.09
Vanadium	NS	**3.6**	NS	NS	**57.3**			**57.3**	**16.0**			**16.0**	**11.0**			**11.0**	57.3	11	11	28.1
Zinc	NS	**1,100**	NS	66.6	91.6	UJ	I	45.8	54.0	U		27.0	10.0	UJ	L	5.0	45.8	5	5	25.93
Cyanide (weak acid dissociable)*	200	**0.62**	NS	5.2	5.0	U		2.5	5.0	U		2.5					2.5	2.5	2.5	2.5
Natural Attenuation Parameters																				
Alkalinity (mg/l)	NS	NS	NS		310			310	180			180	310			310	310	180	310	266.67
Chloride (mg/l)	NS	NS	NS		34.0			34.0	31.0	B	H	31.0	9.5			9.5	34.0	9.5	9.5	24.8
Ethane (µg/l)	NS	NS	NS																	
Ethene (µg/l)	NS	NS	NS																	
Iron, Ferrous (mg/l)	NS	NS	NS																	
Methane (µg/l)	NS	NS	NS																	
Nitrate (mg/l)	10,000	**10,000**	NS		0.10	U		0.05	1.1			1.1	0.28			0.28	1.10	0.05	0.280	0.48
Sulfate (mg/l)	NS	NS	NS		38.0			38.0	16.0	B	H	16.0	21.0			21.0	38.0	16.0	21.0	25.0
Sulfide (mg/l)	NS	NS	NS										0.20	U		0.10	0.1	0.10	0.1	0.1
Total Dissolved Solids (mg/l)	NS	NS	NS										400			400	400	400	400	400
TKN (mg/l)	NS	NS	NS		0.90			0.90	0.70			0.70	0.50	U		0.25	0.9	0.3	0.3	0.62
Total Organic Carbon (mg/l)	NS	NS	NS										6.8			6.8	6.8	6.8	6.8	6.8

TABLE C-2.4
Summary of Groundwater Data - Inorganic Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	COPC Screening Levels			RGP Effluent Criteria	Concentrations in µg/l (except as noted)																			
					SH-05D																			
					9/11/2001				5/21/2002				11/4/2003				10/2/2006				SH-05D Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Metals																								
Aluminum	NS	**3,600**	NS	NS	66.3			66.3	220			220	160	J	L	160	50.0	U		25.0	220	25	25	117.8
Antimony	6	**1.5**	NS	5.60	11.1	U		5.6	1.1	U		0.6	1.0	U		0.5	0.50	U		0.25	5.6	0.25	0.25	1.7125
Arsenic	10	**0.045**	NS	10.00	**0.33**	J	I	**0.33**	0.45	UJ	I	0.23	**0.27**			**0.27**	**0.74**			**0.74**	0.7	0.225	0.74	0.4
Barium	2,000	**260**	NS	NS	16.8			16.8	14.0	U		7.0	12.0			12.0	10.0			10.0	16.8	7	10.0	11.5
Beryllium	4	**7.3**	NS	NS	1.1	U		0.6	0.56	U		0.28	1.0	U		0.5	0.20	U		0.10	0.55	0.1	0.10	0.36
Cadmium	5	**1.8**	NS	0.20	1.1	U		0.6	0.11	U		0.06	1.0	U		0.5	0.10	U		0.05	0.55	0.05	0.05	0.29
Calcium	NS	NS	NS	NS	37,500	J	H	37,500	29,000	U		14,500	37,000			37,000	41,000			41,000	41,000	14,500	41,000	32,500
Chromium[%]	100	**11**	NS	48.8/11.4	6.3	J	I	6.3	1.1	U		0.6	1.0	U		0.5	0.66			0.66	6.3	0.5	0.66	2.0
Cobalt	NS	**73**	NS	NS	1.1	U		0.6	0.52	U		0.26	1.1			1.1	0.79			0.79	1.1	0.3	0.79	0.675
Copper[&]	1,300	**150**	NS	5.2	1.1	U		0.6	0.56	U		0.28	1.1			1.1	1.0	U		0.5	1.1	0.28	0.5	0.6
Iron	NS	**1,100**	NS	1,000	211	U		105.5	310			310	560			560	410			410	560	105.5	410	346
Lead[&]	15	NS	NS	1.3	1.1	U		0.6	0.27	U		0.14	1.0	U		0.5	0.50	U		0.25	0.6	0.135	0.25	0.4
Magnesium	NS	NS	NS	NS	16,000			16,000	16,000	U		8,000	17,000	J	L	17,000	21,000			21,000	21000	8,000	21000	15500
Manganese	NS	**88**	NS	NS	62.6			62.6	51.0	U		25.5	64.0			64.0	66.0			66.0	66.0	25.5	66	54.5
Mercury	2	**1.1**	*0.068*	0.9	0.20	U		0.10	0.20	U		0.10	0.20	UJ	L	0.10	0.20	U		0.10	0.10	0.1	0.1	0.10
Nickel	NS	**73**	NS	29	4.2	J	I	4.2	4.0	U		2.0	10.0	U		5.0	5.8			5.8	5.8	2	5.8	4.3
Potassium	NS	NS	NS	NS	834	U		417	730	U		365	760	J	L	760	900			900	900	365	900	611
Selenium	50	**18**	NS	5	1.9			1.9	2.8			2.8	2.0			2.0	2.8			2.8	2.8	1.9	2.8	2.375
Silver	NS	**18**	NS	1.2	1.1	U		0.6	0.11	U		0.06	1.0	U		0.5	0.10	U		0.05	0.55	0.05	0.05	0.29
Sodium	NS	NS	NS	NS	14,600			14,600	14,000	U		7,000	16,000			16,000	16,000			16,000	16,000	7,000	16,000	13,400
Thallium	2	**0.24**	NS	NS	0.32	UJ	I	0.16	0.17	UJ	I	0.09	0.075	UJ	I	0.038	0.20	U		0.10	0.16	0.0375	0.1	0.10
Vanadium	NS	**3.6**	NS	NS	11.1	U		5.6	1.1	U		0.6	1.0	U		0.5	1.0	U		0.5	5.6	0.5	0.5	1.8
Zinc	NS	**1,100**	NS	66.6	28.5	UJ	I	14.3	13.0	U		6.5	10.0	UJ	L	5.0	5.8	U		2.9	14.25	2.9	2.9	7.1625
Cyanide (weak acid dissociable)*	200	**0.62**	NS	5.2	5.0	U		2.5	5.0	U		2.5									2.5	2.5	2.5	2.5
Natural Attenuation Parameters																								
Alkalinity (mg/l)	NS	NS	NS		71.0			71.0	67.0			67.0	76.0			76.0	85.0			85.0	85	67	85.0	74.75
Chloride (mg/l)	NS	NS	NS		44.0			44.0	43.0	B	H	43.0	50.0			50.0	53.0			53.0	53.0	43	53	47.5
Ethane (µg/l)	NS	NS	NS														0.025	U		0.0125	0.0125	0.0125	0.0125	0.0125
Ethene (µg/l)	NS	NS	NS														1.0			1.0	1	1	1	1
Iron, Ferrous (mg/l)	NS	NS	NS														1.0	U		0.5	0.5	0.5	0.5	0.5
Methane (µg/l)	NS	NS	NS														20.0			20.0	20	20	20	20
Nitrate (mg/l)	10,000	**10,000**	NS		0.72			0.72	0.77			0.77	0.76			0.76	0.75			0.75	0.77	0.72	0.75	0.75
Sulfate (mg/l)	NS	NS	NS		38.0			38.0	56.0			56.0	72.0			72.0	71.0			71.0	72.0	38.0	71	59.3
Sulfide (mg/l)	NS	NS	NS										0.20	U		0.10	0.20	UJ	L	0.10	0.1	0.10	0.1	0.1
Total Dissolved Solids (mg/l)	NS	NS	NS										280			280	330			330	330	280	330	305
TKN (mg/l)	NS	NS	NS		0.50	U		0.25	0.50	U		0.25	0.50	U		0.25	0.50	U		0.25	0.25	0.3	0.25	0.25
Total Organic Carbon (mg/l)	NS	NS	NS										1.2			1.2	1.0	U		0.5	1.2	0.5	0.5	0.9

TABLE C-2.4
Summary of Groundwater Data - Inorganic Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Concentrations in µg/l (except as noted)																			
	COPC Screening Levels			RGP Effluent Criteria	SH-06D															
					9/6/2001				5/22/2002				10/29/2003				SH-06D Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Metals																				
Aluminum	NS	**3,600**	NS	NS	**3,880**	J	I	**3,880**	5,000	UJ	I	2,500	12,000	U		6,000	6,000	2,500	6,000	4126.7
Antimony	6	**1.5**	NS	5.60	**14.0**	J	I	**14.0**	**14.0**	J	I	**14.0**	**20.0**			**20.0**	20	14	20	16
Arsenic	10	**0.045**	NS	10.00	**539**	J	I	**539**	**520**	J	H	**520**	**800**	J	H	**800**	800.0	520	800	619.7
Barium	2,000	**260**	NS	NS	5.8	J	I	5.8	25.0	UJ	I	12.5	12.0			12.0	12.5	5.8	12	10.1
Beryllium	4	**7.3**	NS	NS	1.1	UJ	I	0.6	5.0	UJ	I	2.5	5.0	U		2.5	2.50	0.55	2.5	1.85
Cadmium	5	**1.8**	NS	0.20	1.1	UJ	I	0.6	0.50	UJ	I	0.25	5.0	U		2.5	2.50	0.25	2.5	1.10
Calcium	NS	NS	NS	NS	19,800	J	I	19,800	100,000	UJ	I	50,000	59,000			59,000	59,000	19,800	59,000	42,933
Chromium[%]	100	**11**	NS	48.8/11.4	**11.3**	J	I	**11.3**	9.4	J	I	9.4	10.0			10.0	11.3	9.4	10	10.2
Cobalt	NS	**73**	NS	NS	6.2	J	I	6.2	6.5	UJ	I	3.3	5.0	U		2.5	6.2	2.5	2.5	3.98
Copper[&]	1,300	**150**	NS	5.2	108	J	I	108	56.0	J	I	56.0	61.0			61.0	108.0	56.0	61	75.0
Iron	NS	**1,100**	NS	1,000	231	J	I	231	10,000	UJ	I	5,000	**1,600**			**1,600**	5,000	231	1,600	2,277
Lead[&]	15	NS	NS	1.3	10.5	J	I	10.5	17.0	J	I	17.0	6.8			6.8	17.0	6.8	6.8	11.4
Magnesium	NS	NS	NS	NS	1,390	UJ	I	695	50,000	UJ	I	25,000	12,000	U		6,000	25000	695	6000	10565
Manganese	NS	**88**	NS	NS	**205**	J	I	**205**	180	UJ	I	90	**140**			**140**	205.0	90.0	140	145.0
Mercury	2	**1.1**	*0.068*	0.9	0.20	U		0.10	0.20	U		0.10	0.20	U		0.10	0.10	0.1	0.1	0.10
Nickel	NS	**73**	NS	29	**261**	J	I	**261**	200	UJ	I	100	**230**			**230**	261.0	100	230	197.0
Potassium	NS	NS	NS	NS	7,330	J	I	7,330	25,000	UJ	I	12,500	12,000	U		6,000	12,500	6,000	6,000	8,610
Selenium	50	**18**	NS	5	11.7	J	I	11.7	7.4	J	I	7.4	7.3			7.3	11.7	7.3	7.3	8.8
Silver	NS	**18**	NS	1.2	1.1	UJ	I	0.6	0.80	J	I	0.80	5.0	U		2.5	2.50	0.55	2.5	1.28
Sodium	NS	NS	NS	NS	7,190,000	J	I	7,190,000	5,500,000	J	I	5,500,000	8,300,000			8,300,000	8,300,000	5,500,000	8,300,000	6,996,667
Thallium	2	**0.24**	NS	NS	0.32	UJ	I	0.16	0.75	UJ	I	0.38	0.38	UJ	I	0.19	0.38	0.16	0.19	0.24
Vanadium	NS	**3.6**	NS	NS	**2,860**	J	I	**2,860**	**1,700**	J	H	**1,700**	**2,800**	J	H	**2,800**	2860.0	1700	2800	2453.3
Zinc	NS	**1,100**	NS	66.6	12.9	UJ	I	6.5	50.0	UJ	I	25.0	50.0	U		25.0	25	6.45	25	18.82
Cyanide (weak acid dissociable)*	200	**0.62**	NS	5.2	5.0	UJ	L	2.5	5.0	U		2.5					2.5	2.5	2.5	2.5
Natural Attenuation Parameters																				
Alkalinity (mg/l)	NS	NS	NS		17,000			17,000	13,000			13,000	18,000			18,000	18000	13000	18000	16000
Chloride (mg/l)	NS	NS	NS		120			120	140			140	130			130	140.0	120	130.0	130.0
Ethane (µg/l)	NS	NS	NS																	
Ethene (µg/l)	NS	NS	NS																	
Iron, Ferrous (mg/l)	NS	NS	NS																	
Methane (µg/l)	NS	NS	NS																	
Nitrate (mg/l)	10,000	**10,000**	NS		0.32			0.32	1.0	UJ	I	0.5	0.50	U		0.25	0.50	0.25	0.250	0.36
Sulfate (mg/l)	NS	NS	NS		150			150	180	J	L	180	180			180	180.0	150.0	180.0	170.0
Sulfide (mg/l)	NS	NS	NS										0.20	UJ	L	0.10	0.1	0.10	0.10	0.1
Total Dissolved Solids (mg/l)	NS	NS	NS										32,000			32,000	32,000	32,000	32,000	32,000
TKN (mg/l)	NS	NS	NS		8.7			8.7	5.6	J	I	5.6	5.8			5.8	8.7	5.6	5.8	6.7
Total Organic Carbon (mg/l)	NS	NS	NS										74.0			74.0	74.0	74.0	74.0	74.0

TABLE C-2.4
Summary of Groundwater Data - Inorganic Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Concentrations in µg/l (except as noted)												Concentrations in µg/l (except as noted)			
	COPC Screening Levels			RGP Effluent Criteria	Shallow Well Summary				Deep Well Summary				Estimated Influent Conc			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Maximum	Minimum	Most Recent	Mean	Maximum	Minimum	Most Recent	Mean	Maximum	Minimum	Most Recent	Mean
Metals																
Aluminum	NS	**3,600**	NS	NS	3,553	448	628	1637.5	3,110	1,263	3,013	2122.2	3508.3	529.0	866	1686.0
Antimony	6	**1.5**	NS	5.60	5.6	1.635	2.06	3.08	12.78	7.13	10.13	8.86	6.27	2.18	2.87	3.66
Arsenic	10	**0.045**	NS	10.00	30.1	7.9	9.925	17.9	400.4	260.1125	400.37	310.0	67.1	33.12	48.97	47.1
Barium	2,000	**260**	NS	NS	37.5	10.7125	15.0	20.9	14.7	6.4	11	10.8	35.2	10.28125	14.6	19.8
Beryllium	4	**7.3**	NS	NS	0.55	0.245	0.30	0.42	1.53	0.325	1.3	1.10	0.65	0.253	0.4	0.49
Cadmium	5	**1.8**	NS	0.20	0.55	0.09	0.3	0.35	1.53	0.15	1.275	0.69	0.65	0.096	0.40	0.38
Calcium	NS	NS	NS	NS	16,543	3,838	7,925	8,655	50,000	17,150	50,000	37,717	19,888	5,169	12,133	11,561
Chromium[%]	100	**11**	NS	48.8/11.4	11.6	3.5	4.7	7.0	8.8	5.0	5.33	6.1	11.3	3.6	4.763	6.9
Cobalt	NS	**73**	NS	NS	3.125	0.8	1.45	1.80	3.65	1.38	1.645	2.33	3.18	0.89	1.47	1.85
Copper[&]	1,300	**150**	NS	5.2	40.1	9.7875	19.5	23.0	54.6	28.1	30.75	37.8	41.5	11.6	20.63	24.5
Iron	NS	**1,100**	NS	1,000	3,255	990.125	1,575	1,896	2,780	168.25	1,005	1,312	3,208	907.94	1,518	1,837
Lead[&]	15	NS	NS	1.3	152.9	38.5375	44.125	82.6	8.8	3.4675	3.5	5.9	138.5	35.0305	40.1	75.0
Magnesium	NS	NS	NS	NS	2887.5	479	902.5	1367.42	23000	4347.5	13500	13032.5	4898.75	866.08	2162.25	2533.93
Manganese	NS	**88**	NS	NS	167.8	69.1	91.75	116.8	135.5	57.8	103	99.8	164.5	67.9	92.875	115.1
Mercury	2	**1.1**	*0.068*	0.9	0.13	0.1	0.1	0.11	0.10	0.1	0.1	0.10	0.12	0.1	0.1	0.11
Nickel	NS	**73**	NS	29	26.0	6.0875	9.575	15.1	133.4	51	117.9	100.6	36.8	10.58	20.41	23.6
Potassium	NS	NS	NS	NS	3,258	964	2,300	2,051	6,700	3,183	3,450	4,610	3,602	1,186	2,415	2,306
Selenium	50	**18**	NS	5	2.3	0.825	1.35	1.50	7.25	4.6	5.05	5.5875	2.795	1.2025	1.72	1.91
Silver	NS	**18**	NS	1.2	0.55	0.0725	0.295	0.34	1.53	0.3	1.275	0.79	0.65	0.10	0.393	0.38
Sodium	NS	NS	NS	NS	544,000	271,250	312,500	407,104	4,158,000	2,753,500	4,158,000	3,505,033	905,400	519,475	697,050	716,897
Thallium	2	**0.24**	NS	NS	0.17	0.0375	0.04375	0.10	0.27	0.09875	0.145	0.17	0.18	0.044	0.054	0.10
Vanadium	NS	**3.6**	NS	NS	90.6	22.5	25.5	50.9	1432.8	850.25	1400.25	1227.6	224.8	105.28	162.98	168.5
Zinc	NS	**1,100**	NS	66.6	41.6375	13.1875	13.8125	24.60	19.625	4.675	13.95	12.99	39.44	12.34	13.83	23.44
Cyanide (weak acid dissociable)*	200	**0.62**	NS	5.2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Natural Attenuation Parameters																
Alkalinity (mg/l)	NS	NS	NS		1022.5	585	645.0	819.58	9042.5	6533.5	9042.5	8037.38	1824.5	1179.85	1484.75	1541.36
Chloride (mg/l)	NS	NS	NS		31.0	12.2	12.375	23.8	96.5	81.5	91.5	88.8	37.6	19.13	20.3	30.3
Ethane (µg/l)	NS	NS	NS		0.225	0.225	0.225	0.225	0.0125	0.0125	0.0125	0.0125	0.20	0.20	0.20	0.20
Ethene (µg/l)	NS	NS	NS		0.3	0.3	0.3	0.3	1	1	1	1	0.37	0.37	0.37	0.37
Iron, Ferrous (mg/l)	NS	NS	NS		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Methane (µg/l)	NS	NS	NS		2,200	2200	2200	2,200	20	20	20	20	1,982	1982	1982	1,982
Nitrate (mg/l)	10,000	**10,000**	NS		0.41	0.03125	0.20125	0.18	0.64	0.485	0.500	0.55	0.43	0.08	0.231	0.21
Sulfate (mg/l)	NS	NS	NS		39.8	19.6	21.25	28.7	126.0	94.0	125.5	114.6	48.4	27.0	31.7	37.3
Sulfide (mg/l)	NS	NS	NS		0.1625	0.14	0.1625	0.1525	0.1	0.10	0.10	0.1	0.16	0.14	0.16	0.15
Total Dissolved Solids (mg/l)	NS	NS	NS		1,118	858	893	988	16,165	16,140	16,165	16,153	2,622	2,386	2,420	2,504
TKN (mg/l)	NS	NS	NS		2.85	1.7	1.6875	2.16	4.475	2.9	3.0	3.475	3.01	1.8	1.8	2.29
Total Organic Carbon (mg/l)	NS	NS	NS		17.2	15.8	16.5	16.5	37.6	37.3	37.3	37.4	19.2	17.9	18.6	18.6

TABLE C-2.5
Summary of Groundwater Data - Field Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Units as noted																							
	COPC Screening Levels			RGP Effluent Criteria	SH-04S																			
					9/11/2001				5/20/2002				10/28/2003				10/4/2006				SH-04S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Field Parameters																								
pH (S.U.)	NS	NS	NS	NS	11.9			11.9	11.4			11.4	11.3			11.3		R			11.9	11	11.3	11.6
Temperature (^{o}C)	NS	NS	NS	NS	13.5			13.5	10.1			10.1	12.5			12.5	13.6			13.6	13.6	10.1	13.57	12.4
Specific Conductivity (µS/cm)	NS	NS	NS	NS	3,900			3,900	2,200			2,200	2,600			2,600	1,525			1,525	3,900	1525	1525	2,556
Dissolved Oxygen (mg/l)	NS	NS	NS	NS	0.6			0.6	0.1			0.1	0.2			0.2	0.3			0.3	0.6	0.12	0.3	0.3
ORP (mV)	NS	NS	NS	NS	-189			-189	-57			-57	-212			-212	-135.8			-135.8	-57	-212	-135.8	-148.45
Turbidity (NTU)	NS	NS	NS	NS	33			33	11			11	9.0			9.0	3.6			3.6	33.0	3.59	3.59	14.1

TABLE C-2.5
Summary of Groundwater Data - Field Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Units as noted																							
	COPC Screening Levels			RGP Effluent Criteria	SH-05S																			
					9/11/2001				5/21/2002				10/29/2003				10/4/2006				SH-05S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Field Parameters																								
pH (S.U.)	NS	NS	NS	NS	12.0			12.0	11.7			11.7	9.7			9.7	10.7			10.7	12.0	10	9.7	11.6
Temperature (^{o}C)	NS	NS	NS	NS	13.7			13.7	10.7			10.7	13.6			13.6	15.49			15.49	15.5	10.65	15.49	13.4
Specific Conductivity (µS/cm)	NS	NS	NS	NS	3,200			3,200	2,200			2,200	790			790	1,296			1296	3,200	790	1296	1,872
Dissolved Oxygen (mg/l)	NS	NS	NS	NS	2.8			2.8	0.0			0.0	3.1			3.1	3.32			3.32	3.3	0.0	3.32	2.3
ORP (mV)	NS	NS	NS	NS	-47			-47	-150			-150	-122			-122	-85.9			-85.9	-47	-150	-85.9	-101.225
Turbidity (NTU)	NS	NS	NS	NS	52			52	8.0			8.0	5.6			5.6	5.21			5.21	52.0	5.21	5.21	17.7

TABLE C-2.5
Summary of Groundwater Data - Field Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Units as noted																			
	COPC Screening Levels			RGP Effluent Criteria	SH-06S															
					9/6/2001				5/22/2002				10/29/2003				SH-06S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Field Parameters																				
pH (S.U.)	NS	NS	NS	NS	9.9			9.9	10.0			10.0	9.9			9.9	10.0	10	10.0	9.9
Temperature (^{o}C)	NS	NS	NS	NS	14.8			14.8	11.8			11.8	14.7			14.7	14.8	11.8	14.7	13.8
Specific Conductivity (µS/cm)	NS	NS	NS	NS	1,600			1,600	1,500			1,500	1,300			1,300	1,600	1300	1300	1,467
Dissolved Oxygen (mg/l)	NS	NS	NS	NS	0.1			0.1	0.0			0.0	0.4			0.4	0.4	0.0	0.4	0.2
ORP (mV)	NS	NS	NS	NS	277			277	-210			-210	-172			-172	277	-210	-172	-35
Turbidity (NTU)	NS	NS	NS	NS	180			180	60			60	5.7			5.7	180.0	5.7	5.7	81.9

TABLE C-2.5
Summary of Groundwater Data - Field Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Units as noted																			
	COPC Screening Levels			RGP Effluent Criteria	SH-16S															
					9/11/2001				5/17/2002				11/19/2003				SH-16S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Field Parameters																				
pH (S.U.)	NS	NS	NS	NS	7.6			7.6	7.3			7.3	7.3			7.3	7.6	7	7.3	7.4
Temperature (^{o}C)	NS	NS	NS	NS	15.5			15.5	12.0			12.0	11.4			11.4	15.5	11.4	11.4	13.0
Specific Conductivity (µS/cm)	NS	NS	NS	NS	600			600	470			470	590			590	600	470	590	553
Dissolved Oxygen (mg/l)	NS	NS	NS	NS	1.4			1.4	1.3			1.3	2.0			2.0	2.0	1.3	2.0	1.6
ORP (mV)	NS	NS	NS	NS	13			13	242			242	199			199	242	13	199	151.3333333
Turbidity (NTU)	NS	NS	NS	NS	12			12	20			20	7.8			7.8	20.0	7.8	7.8	13.3

TABLE C-2.5
Summary of Groundwater Data - Field Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Units as noted																							
	COPC Screening Levels			RGP Effluent Criteria	SH-05D																			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		9/11/2001				5/21/2002				11/4/2003				10/2/2006				SH-05D Summary			
					Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Field Parameters																								
pH (S.U.)	NS	NS	NS	NS	7.2			7.2	6.9			6.9	6.9			6.9	6.8			6.8	7.2	7	6.9	7.0
Temperature (^{o}C)	NS	NS	NS	NS	14.8			14.8	12.2			12.2	11.4			11.4	12.98			12.98	14.8	11.4	12.98	12.8
Specific Conductivity (µS/cm)	NS	NS	NS	NS	330			330	330			330	340			340	408			408	408	330	408	352
Dissolved Oxygen (mg/l)	NS	NS	NS	NS	2.0			2.0	0.8			0.8	3.5			3.5	0.41			0.41	3.5	0.4	0.41	1.7
ORP (mV)	NS	NS	NS	NS	153			153	185			185	209			209	140.4			140.4	209	140.4	140.4	172
Turbidity (NTU)	NS	NS	NS	NS	9.8			9.8	7.9			7.9	25			25	12.7			12.7	25.0	7.9	12.7	13.9

TABLE C-2.5
Summary of Groundwater Data - Field Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Units as noted																			
	COPC Screening Levels			RGP Effluent Criteria	SH-06D															
					9/6/2001				5/22/2002				10/29/2003				SH-06S Summary			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Result	Qualifier	Bias	Value	Maximum	Minimum	Most Recent	Mean
Field Parameters																				
pH (S.U.)	NS	NS	NS	NS	12.5			12.5	13.1			13.1	12.8			12.8	13.1	13	13.1	12.9
Temperature (^{o}C)	NS	NS	NS	NS	13.9			13.9	11.5			11.5	13.3			13.3	13.9	11.5	13.3	12.9
Specific Conductivity (µS/cm)	NS	NS	NS	NS	24,000			24,000	19,000			19,000	27,000			27,000	27,000	19,000	27000	23,333
Dissolved Oxygen (mg/l)	NS	NS	NS	NS	0.1			0.1	0.0			0.0	0.4			0.4	0.4	0.0	0.4	0.2
ORP (mV)	NS	NS	NS	NS	-334			-334	-247			-247	-198			-198	-198	-334	-198	-260
Turbidity (NTU)	NS	NS	NS	NS	5.2			5.2	13			13	14			14	14.0	5.2	14	10.7

TABLE C-2.5
Summary of Groundwater Data - Field Parameters
Feasibility Study
Blackburn & Union Privileges Superfund Site
Walpole, Massachusetts

Analytes	Units as noted												Units as noted			
	COPC Screening Levels			RGP Effluent Criteria	Shallow Well Summary				Deep Well Summary				Estimated Influent Conc			
	EPA MCL	EPA Region IX Tap Water PRG	EPA Vapor Intrusion Screening		Maximum	Minimum	Most Recent	Mean	Maximum	Minimum	Most Recent	Mean	Maximum	Minimum	Most Recent	Mean
Field Parameters																
pH (S.U.)	NS	NS	NS	NS	12	11	11	11.3	13	12	13	12.6	12.0	11.3	11.83	11.7
Temperature (^{o}C)	NS	NS	NS	NS	14.9	10.98	13.79	13.13	14.35	11.45	13.14	12.87	14.8	11.03	13.73	13.10
Specific Conductivity (µS/cm)	NS	NS	NS	NS	2325	1021	1178	1612	13704	9665	13704	11843	3463	1886	2430	2635
Dissolved Oxygen (mg/l)	NS	NS	NS	NS	1.6	0.3625	1.5	1.1	2.0	0.2	0.405	0.9	1.6	0.35	1.40	1.1
ORP (mV)	NS	NS	NS	NS	103.75	-139.75	-48.68	-33.34	5.50	-96.8	-28.8	-43.91	93.93	-135.46	-46.69	-34.39
Turbidity (NTU)	NS	NS	NS	NS	71.25	5.575	5.575	31.75	19.50	6.55	13.35	12.29	66.08	5.67	6.35	29.81

Notes:

1. "Value" is the numerical value used in the calculations described in this appendix. This values is equal to the laboratory analytical result, or one-half the reporting limit for those constituents not detected above the reporting limit.

2. Samples were collected by Sanborn, Head & Associates, Inc. (SHA) on the dates indicated.

3. For samples collected in 2001, 2002, and 2003, Woods Hole Group Environmental Laboratories (WHGEL) of Raynham, Massachusetts, performed analyses for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260B; semi-volatile organic compounds (SVOCs) by USEPA Method 8270C-EI; and polycyclic aromatic hydrocarbons (PAHs) by USEPA Method 8270C using selective ion monitoring (SIM) (when required to achieve Project Action Levels); metals (except mercury) by United States Environmental Protection Agency (USEPA) Method 6010B and Method 6020; mercury by USEPA Method 7471A; weak acid dissociable cyanide (WAD cyanide) by USEPA Method 4500-CN I; and natural attenuation parameters by USEPA Method 310.1 for alkalinity, USEPA Method 351.2 for total Kjeldahl nitrogen (TKN), USEPA Method 160.1 for total dissolved solids, USEPA Method 415.1 for total organic carbon, USEPA Method 376.2 for sulfide, and USEPA Method 300.0 for the remainder (chloride, nitrate and sulfate).

For samples collected in 2006, Alpha Woods Hole Laboratories (formerly WHGEL) of Raynham, Massachusetts, performed analyses for VOCs by USEPA Method 8260B; PAHs plus bis(2-ethylhexyl)phthalate and carbazole by USEPA Method 8270C using SIM; metals (except mercury) by USEPA Method 6020A; mercury by USEPA Method 7470A; and natural attenuation parameters by USEPA Method 310.1 for alkalinity, USEPA Method 351.2 for total Kjeldahl nitrogen (TKN), USEPA Method 160.1 for total dissolved solids, USEPA Method 415.1 for total organic carbon, USEPA Method 7199 (modified) or Standard Method SM3500Fe D for ferrous iron, Method AM20GAX for methane, ethane, and ethene, USEPA Method 376.2 for sulfide, and USEPA Method 300.0 for the remainder (chloride, nitrate and sulfate).

Screening for field parameters was completed by Sanborn, Head & Associates, Inc. at the time of sample collection on the dates indicated using a YSI 600 multi-parameter sonde (with low flow cell) connected to a MDS 650 display unit or a YSI 556 MPS Multi-Parameter Sonde (with low flow cell).

4. Data validation and data usability assessment were performed by SHA and New Environmental Horizons, Inc. (NEH). Results are presented in the Data Usability Report (SHA, 2002), the May 2002 Groundwater Sampling Report (SHA, 2003), the Phase 1B RI Data Usability Report (SHA, 2004), and in the Addendum to the Remedial Investigation Report – Phase 1B-4/1B-5 Investigations (SHA, 2007).

5. Concentrations for VOCs, SVOCs, metals, and WAD Cyanide are presented in micrograms per liter (µg/l), which are equivalent to parts per billion (ppb). Natural attenuation parameter concentrations are presented in milligrams per liter (mg/l), which are equivalent to parts per million (ppm). pH is presented in standard units (S.U.). Temperature is presented in degrees Celsius (ºC). Specific conductivity is presented in microSiemens per centimeter (µS/cm). Dissolved oxygen is presented in mg/l. ORP is presented in milliVolts (mV). Turbidity is presented in nephelometric turbidity units (NTU).

6. "COPC Screening Levels" indicates contaminants of potential concern (COPC) screening levels used to determine inclusion of an analyte in the human health risk assessment. Analyte detections which exceed the USEPA MCL (shaded values) are shaded. Analyte detections which exceed the EPA Region IX Tap Water PRG (**bold** value) are in **bold**. Analyte detections from shallow wells which exceed the EPA Vapor Intrusion Screening Values (*italic* value) are in *italics*. Analyte detections which exceed the RGP Effluent Criteria (<u>underlined</u> values) are <u>underlined</u>.

"EPA MCL" indicates the values listed are drinking water Maximum Contaminant Levels (MCLs) from the National Primary Drinking Water Standards, dated June 2003 (http://www.epa.gov/safewater/mcl.html).

"EPA Region IX Tap Water PRG" indicates the values listed are from the USEPA Region IX Preliminary Remediation Goals (PRGs) Table, dated October 1, 2004. PRGs based on non-cancer effects are multiplied by 0.1 per USEPA Guidance (USEPA Region I, Risk Update Number 5, September 1999).

"EPA Vapor Intrusion Screening" indicates values listed are from the USEPA Office of Solid Waste and Emergency Response (OSWER) Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), Table 2C, November 29, 2002. These values apply to shallow groundwater (SH-series wells with an S after the well number, and WP-series wells). Target groundwater concentrations based on non-carcinogenic effects are multiplied by 0.1 per USEPA Guidance (USEPA Region I, Risk Update Number 5, September 1999).

"RGP Effluent Criteria" indicates values listed are from the USEPA Remediation & Miscellaneous Contaminated Sites General Permit (RGP) Appendix III - Effluent Limitations, September 2005.

7. "$" indicates the Vapor Intrusion Screening Value guidance document indicates the MCL is used as the Vapor Intrusion Screening Value because the calculated value is less than the MCL.
"†" indicates the MCL and PRG values presented are for total xylenes.
"‡" indicates the Vapor Intrusion Screening Values and PRG values presented are for 1,3-dichloropropene (isomer unspecified).
"%" indicates the MCL presented is for total chromium and the PRG presented is for chromium VI.
"&" indicates the MCLs presented for copper and lead are treatment technique action levels.
"*" indicates the PRG presented is for hydrogen cyanide, and the MCL presented is for free cyanide.

8. Total concentrations listed (e.g. Total AVOCs, CVOCs) are the sum of detected concentrations of the relevant analytes. "AVOCs" are non-chlorinated aromatic volatile organic compounds. "CVOCs" are chlorinated volatile organic compounds. "Other VOCs" are non-AVOC and non-CVOC volatile organic compounds. "PAHs" are polycyclic aromatic hydrocarbons. "Other SVOCs" are non-PAH semi-volatile organic compounds.

9. The following qualifiers and biases were assigned during data validation by NEH. Refer to NEH's Data Usability Reports (included in the Data Usability Report [SHA, 2002], the Phase 1B RI Data Usability Report [SHA, 2004], and the Addendum to the Remedial Investigation Report – Phase 1B-4/1B-5 Investigations [SHA, 2007]) for additional detail regarding qualifiers and bias.

Qualifiers:
"J" - The associated numerical value is an estimated quantity due to quality control criteria exceedance(s). The value is usable for project objectives with the documentation of the uncertainty, bias, and/or imprecision.
"U" - The compound was analyzed for, but was not detected. The associated numerical value is the sample-specific reporting limit. The value is usable for project decisions as a non-detect result at the reporting limit.
"UJ" - The compound was analyzed for, but was not detected. The sample-specific quantitation (reporting) limit is estimated. The non-detect result is usable for project objectives with documentation of the bias or uncertainty in the result.
"R" - Indicates data rejected during validation.

Bias:
"L" - Low
"I" - Indeterminate
"H" - High

APPENDIX C-3

EVALUATION OF POTENTIAL DISPOSAL OPTIONS FOR SOIL/SEDIMENT FROM SSW ALTERNATIVES

APPENDIX C-3

EVALUATION OF POTENTIAL DISPOSAL OPTIONS FOR SOIL/SEDIMENT FROM SSW ALTERNATIVES

In response to comments from the USEPA and representatives of W.R. Grace, Sanborn, Head & Associates, Inc. (SHA) reviewed potential options for on-site disposal of contaminated soil and/or sediment (i.e., remediation waste). The material would be derived from removal of asbestos contaminated sediment/soil currently in Lewis Pond, the Neponset River Floodplain and/or the Former Mill Tail Race. Specifically, our review was informed by the: Massachusetts (MA) Site Assignment for Solid Waste Facilities Regulations (310 CMR 16.00), MA Solid Waste Management Facility (SWMF) Regulations (310 CMR 19.000), MA Contingency Plan (MCP) (310 CMR 40.0000), MA Hazardous Waste Regulations (310 CMR 30.0000), and USEPA Hazardous Waste Regulations, including the Land Disposal Restrictions (LDR) program (40 CFR Part 268).

Based on our review, on-Site disposal of contaminated soil/sediment does not appear to be a feasible remedial option for the following reasons:

- In general, siting requirements for solid and hazardous waste landfills substantially limit, if not preclude, the siting of such facilities at the Site, unless waivers from these ARARs are obtained.

- The LDR regulations likely will require treatment of the soils/sediment if they are characteristically hazardous (e.g., for lead), prior to on-Site disposal, whether in a solid waste or hazardous waste landfill, or Corrective Action Management Unit (CAMU).

- The AOC was constructed as a Removal Action, and hence was not required to comply with all ARARs. The Remedial Action must comply with all ARARs (or invoke a waiver).

- Presuming that the Site buildings stay in place, there is limited available space to construct such a structure, other than within the current AOC area.

Technical challenges include: the feasibility of constructing a landfill *over* the Neponset River and existing (or new) culvert; and incorporating the contaminated soil/sediment previously placed in the AOC within the landfill, or constructing the landfill on top of this material.

In addition to the infeasibility of this option resulting from the above factors, the cost of on-Site disposal does not appear to be significantly less than off-Site disposal, whereas the long-term liabilities for on-Site disposal appear to be substantially greater, even if the remediation waste is deemed non-hazardous.

A Corrective Action Temporary Unit (TU) would allow on-Site *non-land-based* treatment/storage of hazardous remediation waste. Waste managed in TUs does not need to meet LDRs, and if treatment in a TU results in waste complying with LDRs, then no further

treatment is needed prior to off-Site disposal, further enhancing the feasibility of the off-Site disposal option.

Accordingly, we recommend that no further consideration be given to on-Site disposal of soils or sediment as part of this FS.

SOLID WASTE REGULATIONS

Asbestos as Special Waste

MA SWMF Regulations, 310 CMR 19.061 (3), include asbestos waste (friable asbestos or material containing 1% or more asbestos) as a listed special waste. As solid waste, asbestos waste must be disposed in a permitted SWMF landfill, and as special waste, the permitted SWMF landfill must have received specific written approval from MADEP to receive asbestos waste. Also, the SWMF must follow specific management requirements for asbestos waste.

Revisions to MADEP regulations pertaining to asbestos in soil are currently in Draft form "Public Hearing Draft, Asbestos-In-Soil, Regulation and Management Proposal" prepared by MADEP Bureaus of Waste Prevention and Waste Site Cleanup, dated March 19, 2007. In general, these proposed rules appear to result in more stringent regulation of the disposal of asbestos contaminated soil/sediment, most notably soil with greater than 150 mg/kg asbestos containing material (ACM) must be disposed of as special waste at a SWMF landfill permitted to accept special waste. However, soil containing unconsolidated asbestos fibers only, and no asbestos-containing source material, is exempt from being handled/disposed as special waste. Based on federal Clean Air Act Regulations (40 CFR 61.141), Regulated ACM is defined as "any material containing more than 1 percent asbestos" that is friable or may become so, without reference to whether the asbestos is present as source material or unconsolidated fibers. Hence, soil/sediment with greater than 1% unconsolidated fibers still needs to be handled/disposed as Regulated ACM.

On-Site Solid Waste Landfill Review

Solid wastes and special wastes at the Site potentially could be disposed on-Site in a permitted SWMF landfill constructed in accordance with MA SWMF Regulations; however, the requirements for permitting, designing and constructing an on-Site solid waste landfill are substantial. Primary factors that appear potentially to preclude constructing a SWMF landfill at the Site are siting requirements for such facilities, and the limited available space at the Site for the landfill (particularly if the existing buildings remain in place). Siting requirements that appear to be particularly problematic include: exclusion from 100-year floodplain; minimum 200-foot setback from Riverfront Areas; minimum 1,000-foot setback from occupied residential dwellings or other sensitive receptor/structure; and minimum 100-foot setback from property boundary. In addition, MA SWMF design requirements include the construction of: a dual liner; dual leachate collection and handling systems; and a low permeability final cover system. Therefore, a waiver from one or more of the design criteria may also be required.

The MA SWMF Regulations include provisions for waivers from the requirements of the regulations in certain circumstances. Without a waiver from the site assignment regulations in particular, construction of an on-Site SWMF landfill does not appear administratively feasible.

There are also technical challenges that would have to be investigated and overcome, such as: evaluating the feasibility of constructing a landfill *over* the Neponset River and existing (or new) culvert; and assessing whether to incorporate the contaminated soil/sediment previously placed in the AOC within the landfill, or to construct the landfill on top of this material.

Permitting/Regulatory Authority for Construction of Existing AOC

The AOC was constructed in 1992 as a Short-Term Measure/Removal Action to address potential hazards due to asbestos-containing soil and sediment (Short-Term Measure Response Plan, Engineering Evaluation and Cost Analysis, Asbestos Removal Action, South Street site; dated January 1991, by Canonie Environmental). Appendix A of Canonie indicates that because the AOC was part of a removal action, then pursuant to the National Contingency Plan (NCP), the AOC does not need to attain all ARARs; however, remedial actions must comply with all ARARs (or invoke a waiver). In addition, Canonie indicates that MADEP issued a letter that exempted and/or waived the AOC from needing to comply with all of the MSWF site suitability and management/operational rules.

HAZARDOUS WASTE REGULATIONS

USEPA and MA Hazardous Waste Regulations do not consider a material to be hazardous waste until it is "generated", and for contaminated environmental media such as soil or sediment, the point of generation is when it is excavated, or otherwise removed from its original location, and placed in containers or treated ex-situ.

Potential Hazardous Wastes at the Site

Several potentially hazardous wastes[1] are present at the Site, although little data exist to confirm their presence. Based on our understanding of Site history, Site soil and sediment contamination is not due to releases of listed hazardous wastes. The results of the Remedial Investigation (RI) and other previous investigations indicate that some contaminated media from other areas at the Site would be characteristic hazardous wastes, if and when generated (e.g., the high pH soil [and groundwater] within the AOC would be considered a corrosive hazardous waste). The concentrations of lead and chromium in soil/sediment (e.g., from Lewis Pond) considered for on-Site disposal may exceed toxicity characteristic regulatory levels.

[1] For the purpose of this memo, we refer to potentially hazardous wastes as those, if generated (i.e., for soil/ sediment, excavated and removed), would likely be deemed characteristically hazardous. The use of this term does not imply that these contaminated media (e.g., soil, sediment, groundwater) are currently considered hazardous wastes when they are "in place", prior to excavation/generation.

Land Disposal Restriction Requirements

The LDR program sets minimum treatment standards (universal treatment standards [UTS]) that must be met prior to land disposal of hazardous waste (e.g., nonwastewater UTS for lead is 0.75 ppm TCLP). The LDR program also has Soil Alternative Treatment Standards (SATS) for potentially hazardous soils. In general, SATS require: hazardous constituents be reduced by 90% by treatment (for metals, as measured by TCLP); or hazardous constituent concentrations must not exceed 10 times their respective UTS (in 40 CFR 268.48), whichever is *higher*. Even when LDR requirements are achieved, and/or the waste is rendered non-hazardous, the waste must still be disposed in an adequately permitted facility (e.g., a solid waste landfill).

The LDR treatment requirements for listed wastes are somewhat different than those for characteristic wastes. However as stated above, we do not believe that the soil and sediment at the site contain listed wastes, and therefore these requirements do not apply to this discussion.

On-Site Disposal Options for Hazardous Wastes

The USEPA and MA Hazardous Waste Regulations, along with other guidance (particularly an October 14, 1998 USEPA memo "Management of Remediation Waste Under RCRA", and a MADEP guidance document "Master MCP Q &A: 1993 – 2004", dated October 2004), establish how hazardous waste must be handled, treated and disposed. The regulations establish siting, design, construction and operating requirements for hazardous waste treatment, storage and disposal facilities (TSDFs). We have reviewed these regulations and related documents to identify potential options for on-site disposal at the Site of soil/sediment, which if generated, would be considered hazardous waste. These on-site disposal options are:

- On-Site Hazardous Waste Landfill;
- Corrective Action Management Unit (CAMU); and
- Corrective Action Temporary Unit (TU).

On-Site Hazardous Waste Landfill

Hazardous wastes generated at the Site potentially could be disposed on-Site in a permitted hazardous waste landfill built pursuant to USEPA and MA Regulations; however, permitting, design and construction requirements for a hazardous waste landfill are substantial. Similar to a SWMF landfill, primary factors that appear potentially to preclude an on-Site hazardous waste landfill are the siting requirements, and the limited available space (particularly if the existing buildings remain). Siting requirements that appear to be particularly problematic include: exclusion from the 500-year floodplain; minimum 200-foot setback from property boundary; and minimum 1,000-foot setback from existing private drinking water supply wells. Technical challenges also exist similar to those mentioned above for a solid waste landfill

Corrective Action Management Units (CAMU)

Under the CAMU regulations (40 CFR 264.552), USEPA may designate an area of a waste site as a CAMU for *land-based* treatment, storage and/or disposal of hazardous remediation waste, with the Regional Administrator having some discretion to determine the applicability, design and extent of the CAMU. Based on our review of these regulations, waste placed in an on-site CAMU would likely have to be treated on-site to LDR SATS; and the minimum CAMU design standards include: a composite low-permeability liner, leachate collection system and cap. The Regional Administrator can waive the treatment, liner and/or cap requirements.

Considering only a portion of the soil/sediment to be disposed on-Site is likely hazardous waste (if generated), and that the material would likely require on-Site treatment prior to placement in the CAMU, little economic benefit appears to result from implementing/ maintaining a CAMU at the Site; and those economic benefits, if any, likely would not offset the increased environmental liability of leaving waste (hazardous or non-hazardous) on-Site.

Corrective Action Temporary Units (TU)

USEPA TU regulations (40 CFR 264.553) establish *non-land-based* units at waste sites for treatment/storage of hazardous remediation waste. The TU regulations allow USEPA and authorized states to approve TU; and modify standards for temporary tank and container units used to treat/store hazardous remediation waste. These TU may operate for one or two years. Because placement of waste in tanks/containers is not land disposal, waste does not need to be treated to LDRs prior to being placed/treated in a TU. If treatment in a TU results in waste complying with LDRs, then no further treatment is needed prior to land disposal. Similarly, if the treatment in a TU results in waste no longer being characteristically hazardous, then it can be disposed as non-hazardous solid waste.

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