

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action  
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Century Brass Products, Inc. (Retained Parcel)  
Facility Address: Silver Street, Waterbury, Connecticut  
Facility EPA ID #: CTD060008307

1. Has all available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

If yes - check here and continue with #2 below.

If no - re-evaluate existing data, or

if data are not available, skip to #8 and enter "IN" (more information needed) status code.

**BACKGROUND**

**Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

**Definition of "Migration of Contaminated Groundwater Under Control" EI**

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

**Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

**Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is **groundwater** known or reasonably suspected to be **“contaminated”**<sup>1</sup> above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s): See Drawing 3, attached, that shows elevated levels of VOCs and metals in the groundwater as reported in Subsurface Investigation Report, Former Century Brass Products, Waterbury, CT, dated September, 2005, prepared by Loureiro Engineering Associates, Inc.

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Footnotes:

<sup>1</sup>“Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”<sup>2</sup> as defined by the monitoring locations designated at the time of this determination)?

  X   If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”<sup>2</sup>).

\_\_\_\_\_ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”<sup>2</sup>) - skip to #8 and enter “NO” status code, after providing an explanation.

\_\_\_\_\_ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s): See Attachment 4

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<sup>2</sup> “existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.



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5. Is the **discharge** of "contaminated" groundwater into surface water likely to be "**insignificant**" (i.e., the maximum concentration<sup>3</sup> of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

  **X**   If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

       If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations<sup>3</sup> greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

       If unknown - enter "IN" status code in #8.

Rationale and Reference(s):   **See Attachment 5**  

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<sup>3</sup> As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented<sup>4</sup>)?

\_\_\_\_\_ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,<sup>5</sup> appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

\_\_\_\_\_ If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

\_\_\_\_\_ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s): \_\_\_\_\_  
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<sup>4</sup> Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

<sup>5</sup> The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.



- 8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

X  YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Century Brass Retained facility, EPA ID # CTD060008307, located at Silver Street, Waterbury, CT. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

\_\_\_\_\_ NO - Unacceptable migration of contaminated groundwater is observed or expected.

\_\_\_\_\_ IN - More information is needed to make a determination.

Completed by (signature) David Ringquist Date 09/28/05  
 (print) David Ringquist  
 (title) Sanitary Engineer 3

Supervisor (signature) \_\_\_\_\_ Date 09/28/05  
 (print) Diane Duva  
 (title) Supervising Environmental Analyst  
 (EPA Region or State) Connecticut

Locations where References may be found:

Connecticut Department of Environmental Protection, 79 Elm Street, Hartford, Connecticut 06106-1632

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Contact telephone and e-mail numbers

(name) David Ringquist  
 (phone #) 860-424-3573  
 (e-mail) david.ringquist@po.state.ct.us



## **Attachment 1**

Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”<sup>1</sup> above appropriately protective risk-based “levels?”

### **Groundwater**

Groundwater at the site is contaminated as shown by various monitoring wells at the site. See the attached Drawing 3 showing the location of the groundwater monitoring wells and the results of the monitoring. From a report completed by Loureiro Engineering Associates, Inc.: “Groundwater collected from the Site as part of this subsurface investigation was evaluated for the presence of VOCs, SVOCs, PCBs, [Connecticut’s Extractable Total Petroleum Hydrocarbons] (CT ETPH), cyanide, and various metals. Concentrations of several VOCs including PCE, TCE, 11DCA, cDCE, and VC, and several metals were reported in groundwater collected from the areas of the Site at concentrations indicative of one or more release(s) resulting from historical site activities such as the former dry cleaning operation/exterior drum storage area and metal hydroxide sludge landfill. The presence in groundwater of chlorinated hydrocarbons that may be degradation products of PCE (e.g. vinyl chloride, TCE), particularly in the vicinity of the metal hydroxide sludge area, indicates that natural degradation of chlorinated VOCs may be occurring in groundwater at the Site; however, such degradation may be occurring to a lesser degree on the northernmost portion of the Site. With the exception of copper and zinc, the concentrations of metals reported in groundwater do not exceed respective SWPC; however, the elevated concentrations of various metals (including copper and zinc) suggest that site groundwater has been impacted by one or more releases at the Site.....In several instances, the concentrations of zinc and to a lesser degree, PCE and copper, exceed respective SWPC”.

### **Air (indoors)**

There are no buildings on the site, nor are there any within approximately 500 feet of the property boundary. This media is therefore not applicable to the site.

### **Soil (surface, e.g., <2 ft)**

Soil at the site is contaminated as shown by recent analysis of soil samples at the site. See the attached Drawing 2 showing the location of the soil samples and the analytical results. From a report completed by Loureiro Engineering Associates, Inc.:

“Soil samples collected from the Site as part of the subsurface investigation were evaluated for the presence of VOCs, SVOCs, PCBs, CT ETPH, cyanide, and various metals, depending on proximity to certain potential or confirmed release areas,..... Generally, shallow soil at the Site was found to contain elevated concentrations of several metals, particularly copper, lead, and zinc; SVOCs; and VOCs. The presence of these contaminants in shallow soil support the CSM developed for the Site, in that historical operations including metal working, exterior storage of waste materials in drums, and dry cleaning operations, have resulted in an impact to underlying soil. Further, the presence of elevated SVOCs and metals at the Site correlates to the presence of relatively shallow deposits of fill materials including coal, ash, and slag. The concentrations of these constituents of concern exceed one or more of the [Connecticut Remediation Standard Regulations] (RSR) default, numeric criteria for soil (RDEC, IDEC, and GB PMC)”.

RDEC = Residential Direct Exposure Criteria

IDEC = Industrial/Commercial Direct Exposure Criteria

GB PMC = Pollutant Mobility Criteria for areas where the groundwater is classified as “GB”, i.e. not suitable for drinking without treatment.

### **Surface Water**

The Mad River, bisecting the site, was tested by LEA and the results are presented as Attachment 7. These results show that the surface water is not contaminated above human health standards.

### **Sediment**

Sediment in the Mad River is contaminated as shown by recent analysis of sediment samples. See the attached Drawing 2 showing the location of the samples and the analytical results. From a report completed by Loureiro Engineering Associates, Inc.:

“As part of the subsurface investigation completed at the Site, six sediment samples were collected from portions of the Mad River that transect the Site. Based on the presence of two select metals (copper and zinc) at elevated concentrations, it appears that groundwater discharging to surface water and potentially historical discharges from a former on-site tail race may have resulted in an impact to sediment quality in the river.”

### **Subsurf. Soil (e.g., >2 ft)**

Soil at the site is contaminated as shown by recent analysis of soil samples at the site. See the attached Drawing 2 showing the location of the soil samples and the analytical results.

The following six paragraphs are from the Loureiro Engineering Associates, Inc. report:

*“Subsurface soil samples were compared against the default, numeric direct exposure criteria (RDEC and IDEC), and pollutant mobility criteria for a GB groundwater classification area (GB PMC), as tabulated in the RSRs.*

#### **Direct Exposure Criteria**

*Metals were detected at concentrations exceeding the tabulated RDEC and IDEC criteria at two locations at the Site. Specifically, concentrations of arsenic and lead exceeded the RDEC and IDEC at one or more of the following locations: MW-012 (arsenic) and SB-011 (arsenic and lead).*

*CT ETPH were detected at concentrations exceeding the RDEC in borings MW-010 and MW-012. These two locations are located on the northern portion of the Site. Boring MW-010 is located within the Building 5 Former Drum Storage Area. Boring MW-012 is located within an area identified as a former head race, east of Building 5 at the Site.*

*SVOCs were detected at concentrations above the RDEC and IDEC at one location at the Site. Concentrations of the following SVOCs exceeded the noted default, numeric criteria tabulated in the RSRs: benzo(a)anthracene (RDEC and IDEC), benzo(b)fluoranthene (RDEC and IDEC), benzo(a)pyrene (RDEC and IDEC), indeno(1,2,3-c,d)pyrene (RDEC).*

*The compound PCE was detected at concentrations above the RDEC in locations SB-007 and SB-008. Both of these locations are located in the Building 5 Former Drum Storage Area.*

#### **Pollutant Mobility Criteria**

*SVOCs were detected at concentrations above the GB PMC at only one location at the Site, MW-010. Specifically, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, carbazole, and chrysene, exceeded their respective criteria as tabulated in the RSRs. Boring MW-010 is located within the Building 5 Former Drum Storage Area. VOCs were detected at concentrations exceeding the GB PMC in two locations. Specifically, PCE and TCE were both detected at a concentration exceeding the GB PMC in boring SB-007. PCE was also detected at a concentration exceeding the GB PMC in boring SB-008. Both of these sampling locations are located within the Building 5 Former Drum Storage Area.”*

### **Air (outdoors)**

There are no on-going processes or sources of soil contamination at the site that would produce significant air emissions. Although ambient air was not monitored, CTDEP made the judgment that it is not reasonably suspected to be contaminated above appropriately protective risk-based levels.

## Attachment 2

Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

### Groundwater

There are no pathways between contaminated groundwater and any of the possible receptors under current conditions. The site is located in Waterbury where city water is provided to the residential properties adjacent to the site, therefore groundwater is not used as a drinking water source. In addition, contaminants in the groundwater that originate at the site are unlikely to migrate offsite since the groundwater discharges to the Mad River, as discussed in the Loureiro report: *“Based on an evaluation of groundwater elevation data, groundwater along the eastern portion of the Site appears to discharge to the Mad River, which transects the Site from south to north. Based on the near proximity of certain well locations to the Mad River and the interpreted groundwater flow direction, it appears that groundwater data collected as part of this subsurface investigation is representative of groundwater discharging into the Mad River.”* (See Drawing 3, groundwater contour map).

### Soil (surface, e.g., <2 ft), Surface Water, Sediment

Because this is an abandoned site that has a poorly maintained perimeter fence and no trespassing signs, the only potential human receptors under current conditions are trespassers.

### Soil (subsurface e.g., >2 ft)

There are no pathways between contaminated subsoil and the intermittent trespasser, the only potential human receptor. These people are unlikely to excavate soil that would result in an exposure to contaminants in soil greater than two feet deep. In fact, in the past 15 years since the site has been abandoned, there has been no observed evidence of this activity at the site.

### Attachment 3

Can the **exposures** from any of the complete pathways identified in #3 (of the checklist) be reasonably expected to be “**significant**”<sup>4</sup> (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

#### Soil (surface, e.g., <2 ft), Surface Water, Sediment

Because this is an abandoned site, the only potential human receptors under current conditions are trespassers. Exposures from complete pathways between contaminated surface soil, surface water (Mad River), sediment (Mad River) and trespassers are not reasonably expected to be significant due to the very low exposure frequency resulting from:

- The limited exposure time. Trespassers are generally on foot or bicycle. They pass through the site and spend very little time at the site. Motorcycles and all-terrain vehicles have been observed at the site. This appears to occur infrequently as there are no worn trails, a common characteristic of high-use areas;
- The local law enforcement agency makes an effort to keep people out of the site;
- There are a limited number of areas at the site (as shown on Drawing 2) that are contaminated to levels that exceed risk-based criteria.
- It is unlikely that trespassers would use the Mad River for swimming or fishing. These activities have never been observed or reported during the 15 years the CTDEP has been overseeing this site. The Mad River at this location is not an attractive location for either of these uses.
- The site has a perimeter fence and warning signs that, while not in perfect condition, are able to keep people from trespassing to some degree.

## Attachment 4

Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater” as defined by the monitoring locations designated at the time of this determination)?

Based on the data presented on Drawing 3 (attached) of the Loureiro report, we can conclude that contaminated groundwater is expected to remain within the existing area of contaminated groundwater because the groundwater discharges to the Mad River. This conclusion is supported by: 1) the groundwater contours on the eastern side of the Mad River, 2) comparison of VOC concentrations on the eastern side of the river to the western side, and 3) the elevated level of metals found in the Mad River sediments.

The groundwater contours, as shown on Drawing 3 of the Loureiro report (attached), show that the flow is toward the west and northwest, i.e. toward the river. The Loureiro report states: “Groundwater elevations for the Site (on the eastern side of the Mad River) exhibit a decreasing trend from southeast to northwest, indicating an overall flow direction of shallow groundwater towards the northwest and the Mad River. Based on an evaluation of the topographic and geologic maps, as well as the thickness and distribution of the unconsolidated deposits in the vicinity of the Site, it is possible that groundwater from deeper zones in the overburden aquifer beneath the Site migrates beneath the Mad River without directly discharging to the river in the immediate vicinity of the Site. However, the bedrock high located west and north of the Site would limit migration of overburden groundwater in that direction, and it is more likely that deeper groundwater from the Site follows the general trend of the Mad River Valley to the north.”

The VOC concentrations at monitoring well D3 (eastern side of river) show elevated levels of vinyl chloride, perchloroethylene, and trichloroethylene. These same constituents are all non-detect at well MW-11D, located on the opposite side and down stream of the river. Both wells are screened at similar depths.

The sediment contains elevated levels of lead and copper. This could be the result of either surface water run-off or the discharge of contaminated groundwater into the Mad River, or both.

## Attachment 5

Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration<sup>3</sup> of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

The discharge of contaminated groundwater into surface water is insignificant, based on a recent analysis of surface water samples that show no exceedances of the human or ecological risk-based standards. The surface water data can be found at Attachment 7. The surface water sample locations can be found on Drawing 1, attached.



**Attachment 6**  
Bibliography

Loureiro Engineering Associates, Inc., 2005, Subsurface Investigation Report,  
Former Centruy Brass Products, Waterbury, Connecticut

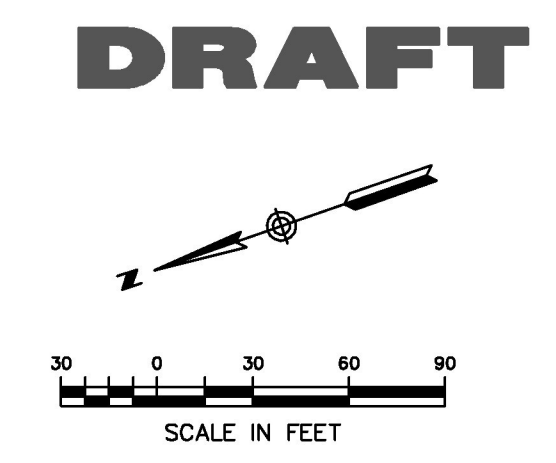
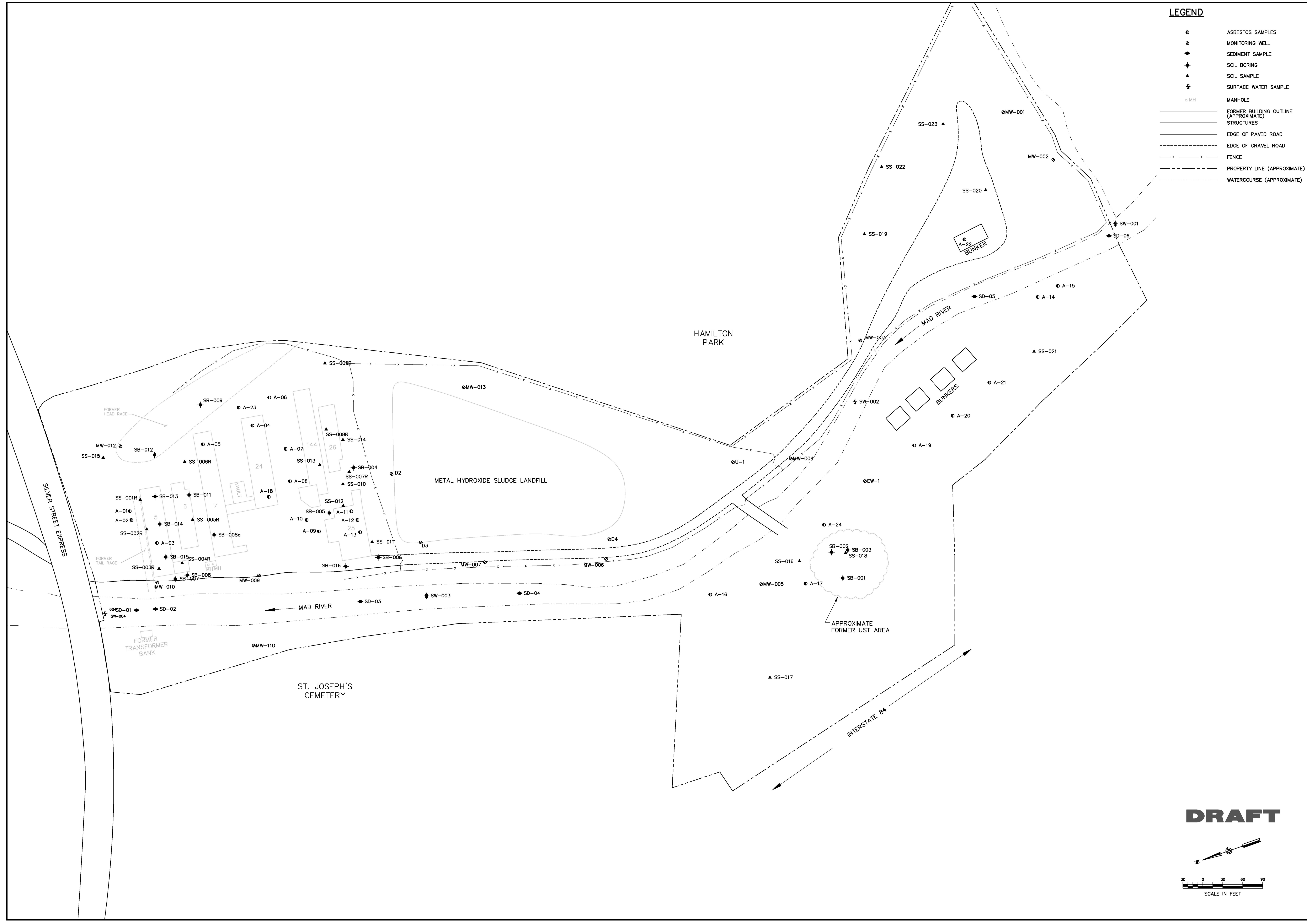
**Attachment 7**  
Surface Water Analytical Data

	Sample Date	9/19/2005	9/19/2005	9/19/2005	9/19/2005
	Sample Time	10:15	11:15	13:50	14:25
	Laboratory	Spec	Spec	Spec	Spec
	Lab. Number	SA34453-10	SA34453-12	SA34453-14	SA34453-16
Date Metals Analyzed	Units	9/23/2005	9/23/2005	9/23/2005	9/23/2005
Arsenic	mg/l	<0.004	<0.004	<0.004	<0.004
Barium	mg/l	0.0227	0.0192	0.0185	0.0183
Cadmium	mg/l	<0.0012	<0.0012	<0.0012	<0.0012
Chromium, Total	mg/l	<0.0025	<0.0025	<0.0025	<0.0025
Copper	mg/l	0.0025	<0.0025	0.0028	0.0044
Lead	mg/l	<0.0038	<0.0038	<0.0038	<0.0038
Mercury	mg/l	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	mg/l	<0.0025	<0.0025	<0.0025	0.0051
Selenium	mg/l	<0.0075	<0.0075	<0.0075	<0.0075
Silver	mg/l	<0.005	<0.005	<0.005	<0.005
Zinc	mg/l	<0.04	<0.04	0.0427	<0.04
Date VOCs Analyzed	Units	9/22/2005	9/22/2005	9/22/2005	9/22/2005
cis-1,2-dichloroethylene	ug/l	ND	ND	ND	5.5
Naphthalene	ug/l	ND	ND	ND	1.2
Tetrachloroethylene	ug/l	ND	ND	ND	4.8

Location	
SW-001	Upstream of site, at confluence of unnamed brook and Mad River.
SW-002	90' West of location MW-003.
SW-003	75' Northwest of location MW-007.
SW-004	Furthest downstream, collected beneath Silver St Express overpass.

**LEGEND**

- ASBESTOS SAMPLES
- ◊ MONITORING WELL
- ◆ SEDIMENT SAMPLE
- ✦ SOIL BORING
- ▲ SOIL SAMPLE
- ♣ SURFACE WATER SAMPLE
- MH MANHOLE
- FORMER BUILDING OUTLINE (APPROXIMATE) STRUCTURES
- EDGE OF PAVED ROAD
- - - EDGE OF GRAVEL ROAD
- x - x - FENCE
- - - - - PROPERTY LINE (APPROXIMATE)
- - - - - WATERCOURSE (APPROXIMATE)



DESCRIPTION OF REVISION		REV.	DATE	APPR.

SCALE: <b>SHOW</b> COMMA NO. 18HW501.001 DRAWN BY: J.A.M. DATE: 8/16/05		SCALE: <b>DATE</b> DATE: 8/16/05 CHECKED BY: K.M.C. DATE: 8/16/05	
<b>SUBSURFACE INVESTIGATION - FORMER CENTURY BRASS PRODUCTS SITE, WATERBURY, CT</b>			
Loureiro Engineering Associates, Inc. 100 Northwest Drive • Plainville, Connecticut 06062 An Employee Owned Company		An Employee Owned Company	
<b>SITE PLAN</b>		DRAWING NO. 1	

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ASBESTOS SAMPLES table with columns for sample ID, date, constituent, and various chemical analysis results.

SEDIMENT SAMPLES table with columns for sample ID, date, constituent, and various chemical analysis results.

ASBESTOS SAMPLES table with columns for sample ID, date, constituent, and various chemical analysis results.

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ASBESTOS SAMPLES table with columns for sample ID, date, constituent, and various chemical analysis results.

SEDIMENT SAMPLES table with columns for sample ID, date, constituent, and various chemical analysis results.

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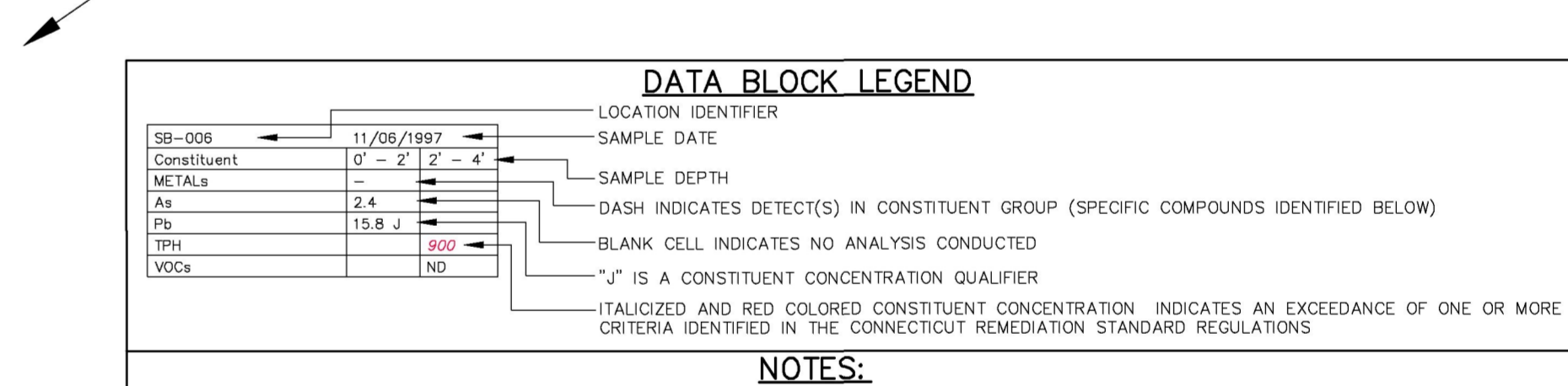
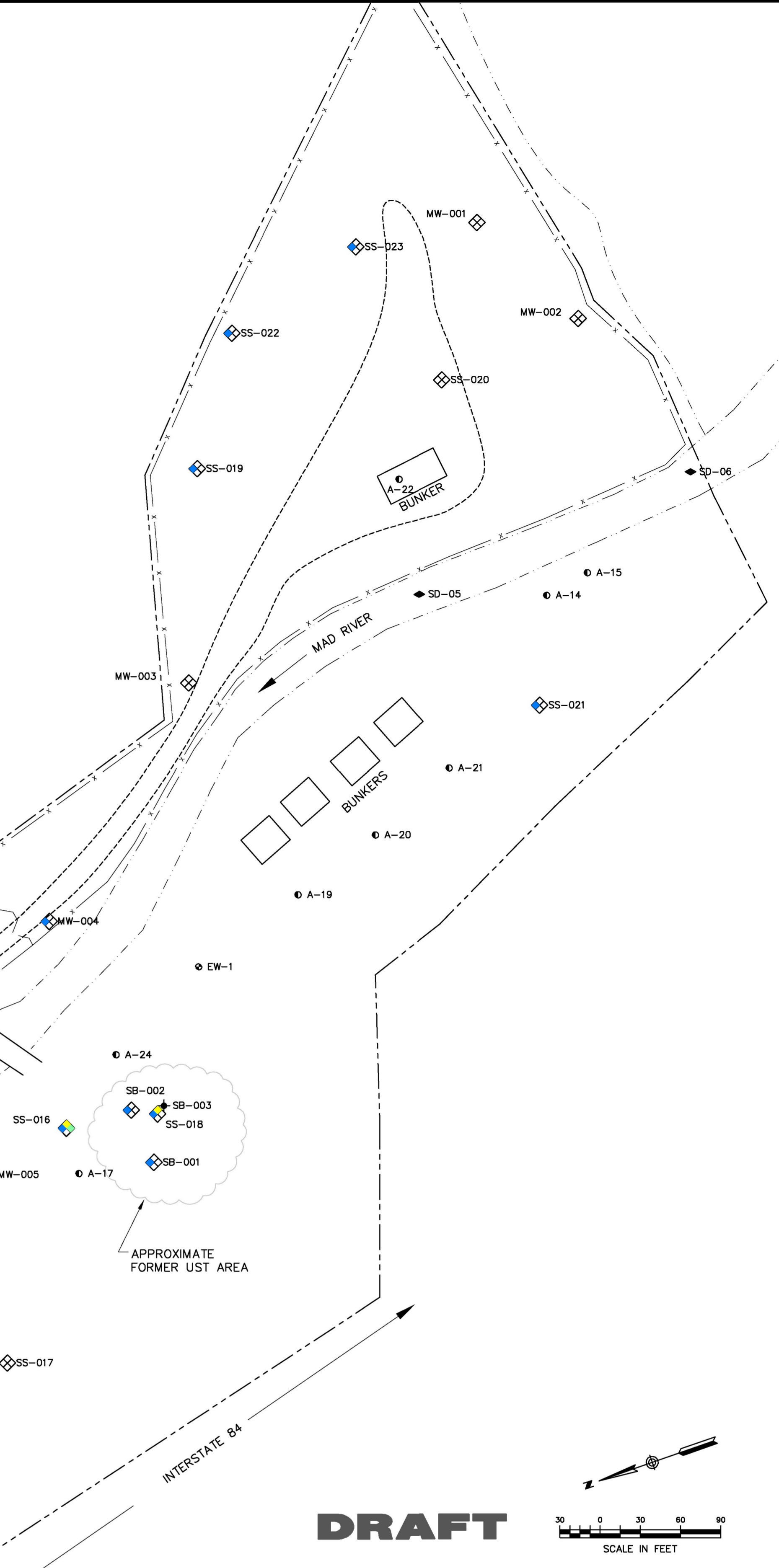
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DATA BLOCK LEGEND table defining symbols for location identifiers, sample dates, sample depths, and detection symbols.

CONSTITUENT ABBREVIATIONS table listing various chemical compounds and their abbreviations.

LEGEND table defining symbols for monitoring wells, sediment samples, soil borings, and other site features.

NOTES section providing additional information about the sampling locations and data.

Project information including company name (Loureiro Engineering Associates, Inc.), project title (SUBSURFACE INVESTIGATION - FORMER CENTURY BRASS PRODUCTS SITE, WATERBURY, CT), drawing title (ASBESTOS, SOIL & SEDIMENT SAMPLING LOCATIONS), and revision table.

Monitoring Well ID	Reference Elevation - Top of Road Box (Feet - NGVDa)	Reference Elevation - Top of PVC Casing (Feet - NGVDa)	Well Construction	Screened Interval (feet)	Measured Depth to Water (Feet)	Well Depth (Feet)	Water Level Elevation (Feet - NGVDa)
MW-001	220.25316	219.96133	0.5" PVC	5 to 15	8.22	15.25	211.74
MW-002	219.34983	219.07346	0.5" PVC	3.5 to 13.5	8.02	13.00	211.05
MW-003	219.15540	217.90357	0.5" PVC	9 to 18	13.88	20.41	204.02
MW-004	215.75604	215.55750	0.5" PVC	11 to 20	12.70	21.47	202.86
MW-005	211.25823	210.81179	0.5" PVC	3.16 to 12.16	9.74	13.79	201.07
MW-006	212.53560	212.08792	0.5" PVC	11 to 21	14.00	22.81	198.09
MW-007	210.42703	210.21833	0.5" PVC	13 to 22	15.31	23.82	194.91
EW-1	212.43250	212.07905	Unknown	Unknown	NM	NM	---
MW-009	202.39728	202.18246	0.5" PVC	6 to 15	9.26	17.00	192.92
MW-010	202.27731	201.95504	1.5" PVC	4 to 14	9.37	17.75	192.59
MW-011	201.61656	201.40536	0.5" PVC	19 to 28	NM	NM	---
MW-012	200.73310	200.68864	1.5" PVC	2 to 12	7.10	14.40	193.59
MW-013	214.99471	214.78949	0.5" PVC	11 to 20	14.09	21.79	200.70
U-1	214.09737	213.98210	2" PVC	6 to 16	10.69	17.75	203.29
D-2	212.96427	212.80780	2" PVC	5.5 to 15.5	18.23	26.38	194.58
D-3	213.95294	213.82914	2" PVC	8 to 18	19.21	30.00	194.62
D-4	213.93838	213.42810	2" PVC	7 to 17	dry	13.80	---

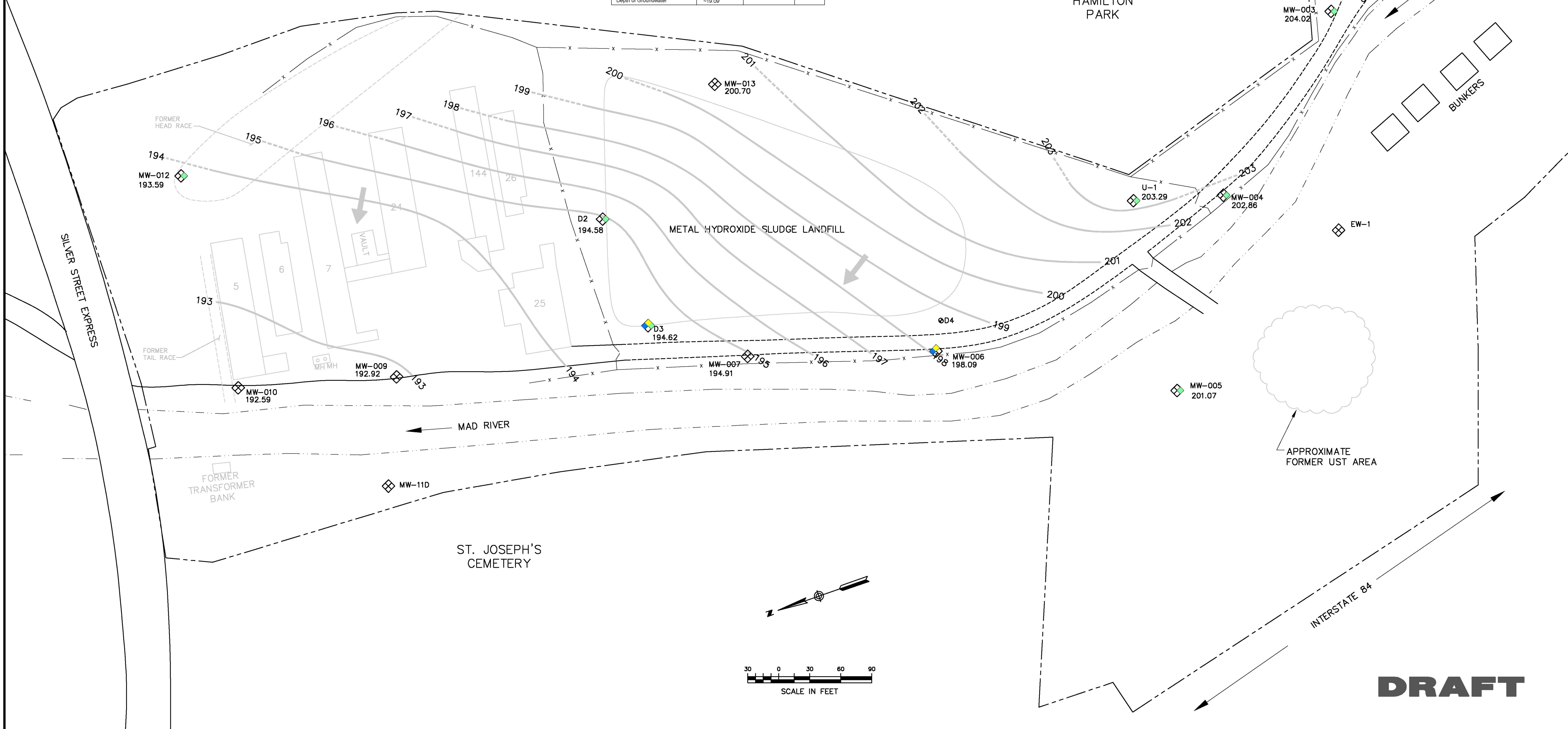
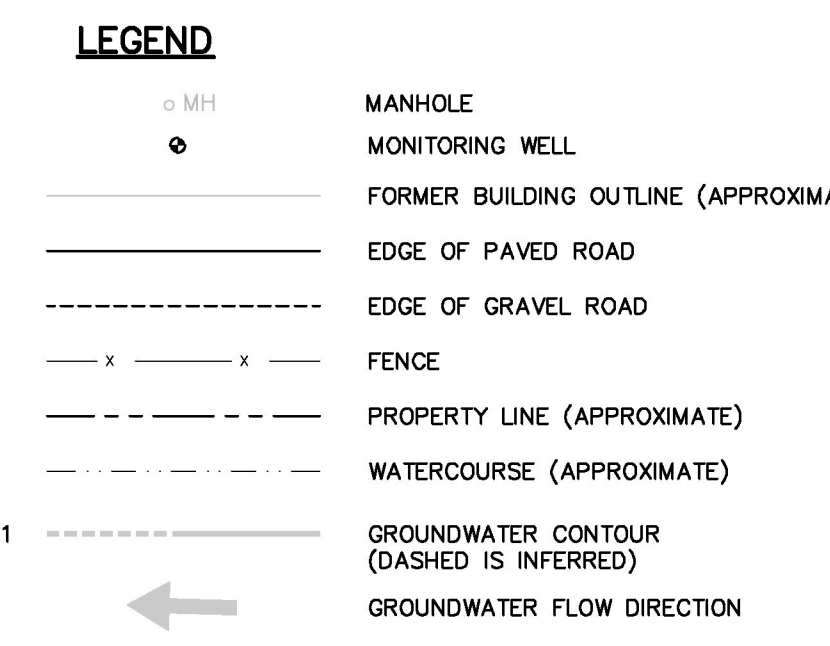
### GROUNDWATER ELEVATIONS - SUBSURFACE INVESTIGATION

#### Century Brass, Hamilton Avenue, Waterbury, Connecticut - 18HW501.001

#### July 18, 2005

Monitoring Well ID	Reference Elevation - Top of Road Box (Feet - NGVDa)	Reference Elevation - Top of PVC Casing (Feet - NGVDa)	Well Construction	Screened Interval (feet)	Measured Depth to Water (Feet)	Well Depth (Feet)	Water Level Elevation (Feet - NGVDa)
MW-001	220.25316	219.96133	0.5" PVC	5 to 15	8.22	15.25	211.74
MW-002	219.34983	219.07346	0.5" PVC	3.5 to 13.5	8.02	13.00	211.05
MW-003	219.15540	217.90357	0.5" PVC	9 to 18	13.88	20.41	204.02
MW-004	215.75604	215.55750	0.5" PVC	11 to 20	12.70	21.47	202.86
MW-005	211.25823	210.81179	0.5" PVC	3.16 to 12.16	9.74	13.79	201.07
MW-006	212.53560	212.08792	0.5" PVC	11 to 21	14.00	22.81	198.09
MW-007	210.42703	210.21833	0.5" PVC	13 to 22	15.31	23.82	194.91
EW-1	212.43250	212.07905	Unknown	Unknown	NM	NM	---
MW-009	202.39728	202.18246	0.5" PVC	6 to 15	9.26	17.00	192.92
MW-010	202.27731	201.95504	1.5" PVC	4 to 14	9.37	17.75	192.59
MW-011	201.61656	201.40536	0.5" PVC	19 to 28	NM	NM	---
MW-012	200.73310	200.68864	1.5" PVC	2 to 12	7.10	14.40	193.59
MW-013	214.99471	214.78949	0.5" PVC	11 to 20	14.09	21.79	200.70
U-1	214.09737	213.98210	2" PVC	6 to 16	10.69	17.75	203.29
D-2	212.96427	212.80780	2" PVC	5.5 to 15.5	18.23	26.38	194.58
D-3	213.95294	213.82914	2" PVC	8 to 18	19.21	30.00	194.62
D-4	213.93838	213.42810	2" PVC	7 to 17	dry	13.80	---

a. NGVD - National Geodetic Vertical Datum of 1929.  
 b. Depths in feet below ground surface.  
 NM = Not Measured



### DATA BLOCK LEGEND

LOCATION IDENTIFIER	SAMPLE DATE	SCREENED INTERVAL
CA-80	06/19/2002	-
Constituent	194.58	10.5
METALS	0.0115	
Cd	0.0115	
Pb	0.0066	
Hg	0.466	
Zn	1.82	
VOCs	0.6 L	
TC	3.3	
Depth of Boring	103.50'	
Depth to Groundwater	~11.64'	

DEPTH AS MEASURED ON SAMPLE DATE

- ### NOTES:
- THE RESPECTIVE UNITS FOR GROUNDWATER IN WHICH QUANTIFIABLE CONCENTRATIONS ARE DETECTED ARE AS FOLLOWS: VOCs, SVOCs - MICROGRAMS PER LITER ( $\mu$ g/L); TPH AND METALS - MILLIGRAMS PER LITER (mg/L)
  - VOCs CATEGORY REFERS TO COMPOUNDS DETECTED USING EPA METHOD 8260.
  - GROUNDWATER CONTOURS GENERATED FROM DEPTH MEASUREMENTS TAKEN ON JULY 18, 2005
- ### GENERAL NOTES:
- IN THE CASE OF A DUPLICATE SAMPLE AND CONSTITUENT DETECTS OR NON-DETECTS (ND), THEY ARE SEPARATED BY A SEMICOLON WITHIN THE SAMPLING INTERVAL WHERE THE DUPLICATION OCCURS.
  - ONLY DETECTED METALS (FILTERED OR UNFILTERED) ARE SHOWN ON THE DATA BLOCKS.
  - YELLOW HIGHLIGHTED AREA INDICATES EXCEEDANCE OF MARCH 2003 PROPOSED REVISION TO RSRs FOR RESIDENTIAL VOLATILIZATION CRITERIA.

### LEGEND

- MONITORING WELL (MW)
- SAMPLE W/ DETECT BUT NO EXCEEDANCES
- SAMPLE ANALYZED BUT NO DETECTS

### GROUNDWATER EXCEEDANCES

- INDUSTRIAL / COMMERCIAL VOLATILIZATION CRITERIA (IVC)
- RESIDENTIAL VOLATILIZATION CRITERIA (RVC)
- SURFACE WATER (SW) PROTECTION CRITERIA
- GROUNDWATER PROTECTION CRITERIA (GWPC)

### CONSTITUENT ABBREVIATIONS

A8	ARSENIC	Hg	MERCURY
Ba	BARIUM	Ni	NICKEL
Cd	CADMIUM	Se	SELENIUM
Cr	CHROMIUM (TOTAL)	Ti	TITANIUM
Cu	COPPER	Zn	ZINC
Pb	LEAD		

TPH TOTAL PETROLEUM HYDROCARBONS  
 PCB POLYCHLORINATED BIPHENYL  
 PHYS PHYSICAL ANALYSES

### CONSTITUENT CONCENTRATION QUALIFIERS

ND NONE DETECTED; LESS THAN DETECTION LIMIT  
 J ESTIMATED VALUE: COMPOUND PRESENT AT A CONCENTRATION BELOW THE METHOD DETECTION LIMIT  
 L ESTIMATED VALUE: % DIFFERENCE OF DAILY CALIBRATION STANDARDS OUTSIDE CONTROL LIMITS  
 E ESTIMATED VALUE: CONSTITUENT DETECTED ABOVE THE METHOD DETECTION LIMIT, BUT BELOW THE QUANTIFICATION LIMIT  
 H ESTIMATED VALUE: CONSTITUENT DETECTED ABOVE THE CALIBRATION RANGE. B CONSTITUENT DETECTED IN THE BLANK.

Loureiro Engineering Associates, Inc.  
 100 Northwest Drive • Plainville, Connecticut 06062  
 An Employee Owned Company

**SUBSURFACE INVESTIGATION - FORMER CENTURY BRASS PRODUCTS SITE, WATERBURY, CT**  
**GROUNDWATER SAMPLING LOCATIONS & GROUNDWATER CONTOUR MAP**

SCALE: SHOWN  
 COMM: 18HW501.001  
 DATE: 09/06/05  
 A.C.L.  
 K.M.C.

DRAFT  
 SHEET NO. 1 OF SHEETS 1

DESCRIPTION OF REVISION  
 REV. DATE

# DRAFT

