DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: Colonial Bronze Company
Facility Address: 511 Winsted Rd., Torrington, CT
Facility EPA ID #: CTD058508722

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, 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?

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

   _____ If no - re-evaluate existing data, or

   _____ if data are not available skip to #6 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 "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "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 "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

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).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	_x_	___	___	See discussion below
Air (indoors)[2]	___	_x_	___	See discussion below
Surface Soil (e.g., <2 ft)	_x_	___	___	See discussion below
Surface Water	___	_x_	___	See discussion below
Sediment	___	_x_	___	See discussion below
Subsurf. Soil (e.g., >2 ft)	_x_	___	___	See discussion below
Air (outdoors)	___	_x_	___	See discussion below

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__x__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):
Groundwater: Results of groundwater samples collected and analyzed in 2004 exceeding appropriately protective human health risk-based levels are summarized in the table below (CEE, 2004).

Well	Constituent	Concentration (µg/L)	GA/GAA GWPC[1] (µg/L)	SWPC[2] (µg/L)	R VC[3] (µg/L)	I/C VC[4] (µg/L)
GMW-1	lead	16	15	13	NE	NE
	phenanthrene	0.4	200	0.077	NE	NE
	benzene	230	1	710	130	310
	ethylbenzene	1200	700	580000	2700	36000
	m.p-xylene	3700	530	NE	8700	48000
	o-xylene	1300	530	NE	8700	48000
GZ-9	chromium (hexavalent)	5500	NE	110	NE	NE

[1] Connecticut Department of Environmental Protection (CT DEP) Remediation Standard Regulation (RSR) GA/GAA Groundwater Protection Criteria (GWPC)

[2] CT DEP RSR Surface Water Protection Criteria (SWPC)

[3] CT DEP Proposed Residential Volatilization Criteria (R VC)

[4] CT DEP Proposed Industrial/Commercial Volatilization Criteria (I/C VC)

	chromium (total)	4000	50	NE	NE	NE
	zinc	180	5000	123	NE	NE

Air (indoors): As noted above, benzene was detected in GMW-1 at 230 µg/L, which exceeds the proposed CT DEP RSR R VC, but is below the proposed CT DEP RSR I/C VC. The likely sources of the benzene contamination, gasoline underground storage tanks, were removed in 1991 (CEE, 2004). No residential structures exist within 100 feet of this well. There are no monitoring wells located directly downgradient of well GMW-1. However, the nearest residential structures are located along Northside Drive. As described in the response to Question 3 of this checklist, nine residential wells along Northside Drive were tested in 2004. No VOCs were detected in any of the residential wells tested on this street (CEE, 2004). Therefore, indoor air is not reasonably expected to be contaminated above appropriately protective risk-based levels as a result of contamination from Colonial Bronze. Nevertheless, additional groundwater investigation should be performed to define the nature and extent of groundwater contaminants from the former gasoline underground storage tanks. Until the nature and extent of groundwater contamination is understood and migration is determined by EPA to be under control, regular monitoring should be performed to ensure that contaminants are not migrating near residential structures.

Surface Water and Sediment: The August 1996 Stabilization Demonstration, prepared by GZA for Colonial Bronze, states that in approximately 1927, Troy Brook was channeled in a culvert beneath Colonial Bronze's parking lot and under Winsted Road. In 1944, Colonial Bronze expanded manufacturing operations from brass machining of bar stock to burnishing, dry cutting, lacquering, polishing, bronzing, chromium plating, copper plating, nickel plating and anodizing. Untreated manufacturing wastes were discharged to Troy Brook from 1944 until 1971, when an on-site wastewater treatment system was constructed (GZA, 1996). Treated wastewater continued to be discharged to Troy Brook until 1985, when Colonial Bronze connected to the municipal sanitary sewer. Based on this information, an EPA contractor collected and analyzed sediment samples, in 2003, to evaluate the impact of the previous discharge of Colonial Bronze's manufacturing wastes on Troy Brook. Surface water samples were not collected, as the contaminants of interest would be more likely to reside in sediments than in surface water. Results of a sediment sample collected in an unnamed target brook, linked to Colonial Bronze by a storm drain, and of two sediment samples collected in Troy Brook downstream from its confluence with the unnamed target brook were compared to background sediment samples. Background sediment samples were collected in the Troy Brook upstream of the confluence with the unnamed target brook and in an unnamed discharge to the Troy Brook. All five samples were analyzed for VOCs, metals and cyanide. Results showed that contaminant levels in all samples were well below CT DEP RSR Residential Direct Exposure Criteria (R DEC) and that contaminant levels detected in the unnamed target brook and in Troy Brook downstream from its confluence with the unnamed target brook were generally not elevated above background sample concentrations (Lockheed Martin Information Technologies, 2003). Based on these results, sediments and surface water in Troy Brook are not reasonably expected to be contaminated above appropriately protective human health risk-based levels from Colonial Bronze's former wastewater discharges.

Surface Soil: In a 2004 soil sample collected from 1-3' below ground surface in the boring for well GMW-5, benzo(a)pyrene was detected at a concentration of 1,500 µg/kg, above the CT DEP RSR Industrial/Commercial Direct Exposure Criteria (I/C DEC) of 1,000 µg/kg (CEE, 2004).

Subsurface Soil: In a 2004 soil sample collected from 7-9' below ground surface in the boring for well GMW-1, 300 µg/kg benzene was detected, above the CT DEP RSR I/C DEC of 200 µg/kg; 7,800 µg/kg n-propylbenzene was detected, above the CT DEP RSR I/C DEC of 1,000 µg/kg; and 4,700 µg/kg n-butylbenzene was detected, above the CT DEP RSR I/C DEC of 1,000 µg/kg (CEE, 2004). 1992 post-closure confirmation sampling results collected in the vicinity of the former surface impoundment detected elevated levels of chromium up to 1,420 mg/kg in soil, at 4-4.5' and 6-6.8' below ground surface. These levels exceed the CT DEP R and I/C DEC for hexavalent chromium. Subsurface soil contamination from Colonial Bronze may be present under the shopping complex across Winsted Rd. from Colonial Bronze. From 1944 to 1971, Colonial Bronze discharged untreated wastes to a brook which traveled through wetlands on the property that now houses the shopping complex (GZA, 1996). The brook was culverted when the property was filled for the construction, reportedly in the 1960s (May 2, 2001 conversation with Jamie Gregg). This area is now entirely covered with building and pavement.

Air (outdoors): Outdoor air is not reasonably expected to be contaminated above appropriately protective risk-based levels from Colonial Bronze.

Footnotes:

[1] "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 appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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

Summary Exposure Pathway Evaluation Table

	Potential **Human Receptors** (Under Current Conditions)						
"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	no	yes	no	yes			no
~~Air (indoors)~~	___	___	___				
Soil (surface, e.g., <2 ft)	no	yes	no	yes	no	no	no
~~Surface Water~~	___	___			___	___	___
~~Sediment~~	___	___			___	___	___
Soil (subsurface e.g., >2 ft)				yes			no
~~Air (outdoors)~~	___	___	___	___	___		

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__x__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

Groundwater

Residents: In September 2002, Colonial Bronze contacted the Torrington Water Company to verify municipal water supply to residents in the vicinity of the facility. Through this effort, Colonial Bronze learned that an 8-inch water main had been constructed along Northside Drive in 1989, but that eleven homes, located on Northside Drive, had not connected to the municipal water supply (CEE, 2003). In 2004, Colonial Bronze contacted the owners of these eleven homes to request permission to test their well water. Two of the eleven homeowners informed Colonial Bronze that they relied on the municipal water supply. The Torrington Water Company confirmed the municipal water connections for these two properties. Colonial Bronze sampled wells for the remaining nine homes in 2004 and analyzed samples for VOCs (plus 1,4-dioxane), as well as barium, total and hexavalent chromium, copper, zinc,

nickel, cadmium, lead, and cyanide. Lead was the only constituent detected above CT DEP RSR GA/GAA GWPC in samples from four of the nine wells, and at a concentration just below the GWPC in one well. Based on these results, Colonial Bronze filed Significant Environmental Hazard Notifications to CT DEP. CT DEP performed follow-up well water testing in all five homes. Based on the results of the follow-up testing, CT DEP found that well water in only one of the five homes exceeded GWPC and concluded that the lead in all five homes was attributable to components of each private water system that contained lead (CEE, 2004). As lead was determined to be associated with water systems inside these homes and no other constituents were detected above GWPC, there is currently not a complete pathway between contaminated groundwater from Colonial Bronze and residents. However, as contaminants were detected in groundwater at Colonial Bronze above GWPC, EPA recommends that further investigation be performed to define the extent of groundwater contaminants at Colonial Bronze. Until the extent of contamination is defined and migration is determined by EPA to be under control, EPA recommends that regular monitoring be performed to confirm that groundwater contaminants from Colonial Bronze are not impacting the Northside Drive wells.
Workers: Workers could contact contaminated groundwater while collecting environmental samples.
Daycare: There is not a reasonably expected complete exposure pathway between any daycare facilities located in the vicinity of Colonial Bronze and contaminated groundwater from Colonial Bronze.
Construction Workers: Construction workers could contact contaminated groundwater in any excavation that extends below the water table.
Food: Groundwater in the vicinity of the facility could be used by nearby homeowners for irrigation or raising livestock. However, results of groundwater samples from the nine residential wells in vicinity of the facility, on Northside Drive, showed that all analytes were below the GWPC. Therefore, this exposure pathway is not reasonably expected to be complete.

Surface Soil:
Residents: Contaminants from Colonial Bronze are not reasonably expected to be present in surface soil outside of Colonial Bronze's property.
Workers: Workers at Colonial Bronze could contact contaminated surface soil in the course of collecting environmental samples.
Daycare: There is no on-site daycare at Colonial Bronze and contaminants from Colonial Bronze are not reasonably suspected to be present in surface soil outside of Colonial Bronze's property.
Construction: Construction workers at Colonial Bronze could contact contaminated surface soil during any construction activities in areas where contaminated surface soil is present.
Trespassers: Trespassers at Colonial Bronze would not likely contact contaminated surface soil as soil on the property is covered by buildings and pavement.
Recreation: Contaminated soil is not reasonably expected to be contacted in the course of any recreational activities on the property as soil on the property is covered by buildings and pavement. Contaminants from Colonial Bronze are not reasonably suspected to be present in surface soil outside of Colonial Bronze's property.
Food: Food is not raised on the Colonial Bronze property. Contaminants from Colonial Bronze are not reasonably suspected to be present in surface soil outside of Colonial Bronze's property.

Subsurface Soil:
Construction Workers: Construction workers at Colonial Bronze could contact contaminated subsurface soil in any excavations performed in areas where contaminated soil is present.
Food: Food is not raised on the Colonial Bronze property. Contaminants from Colonial Bronze are not reasonably suspected to be present in subsurface soil outside of Colonial Bronze's property that is used for agriculture.

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (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)?

__x__ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):
A September 14, 2004 letter from Colonial Bronze states that Colonial Bronze will ensure that appropriate protective measures will be taken to prevent significant contaminant exposures to workers or construction workers performing work in areas of the Colonial Bronze property where they could contact contaminated surface or subsurface soil or groundwater. Therefore, worker and construction worker exposure to contaminated surface soil, subsurface soil, or groundwater would not reasonably be expected to be significant.

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and

experience.

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__x__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Colonial Bronze facility, EPA ID CTD058508722, located at 511 Winsted Rd., Torrington, CT under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by (signature) _____ Date 9/16/04
(print) Stephanie Carr
(title) RCRA Facility Manager

Supervisor (signature) _____ Date 9/20/04
(print) Matthew Hoagland
(title) Chief, RCRA Corrective Action Section
(EPA Region or State) EPA New England

References:

Colonial Bronze (2004) letter dated September 14, 2004 from Jamie Gregg, Colonial Bronze to Stephanie Carr, EPA re: Current Human Exposures Under Control

Consulting Environmental Engineers, Inc. (2003) Quality Assurance Project Plan for Colonial Bronze Company, dated May 21, 2003

Consulting Environmental Engineers, Inc. (2004) RCRA Corrective Action Investigations for Colonial Bronze Company, dated August 26, 2004

GZA GeoEnvironmental Inc. (1996) Stabilization Demonstration for Colonial Bronze, dated August 1996.

Lockheed Martin Information Technologies (2003) Sediment Sampling at the Colonial Bronze Company Site, dated September 17, 2003, prepared for U.S. EPA

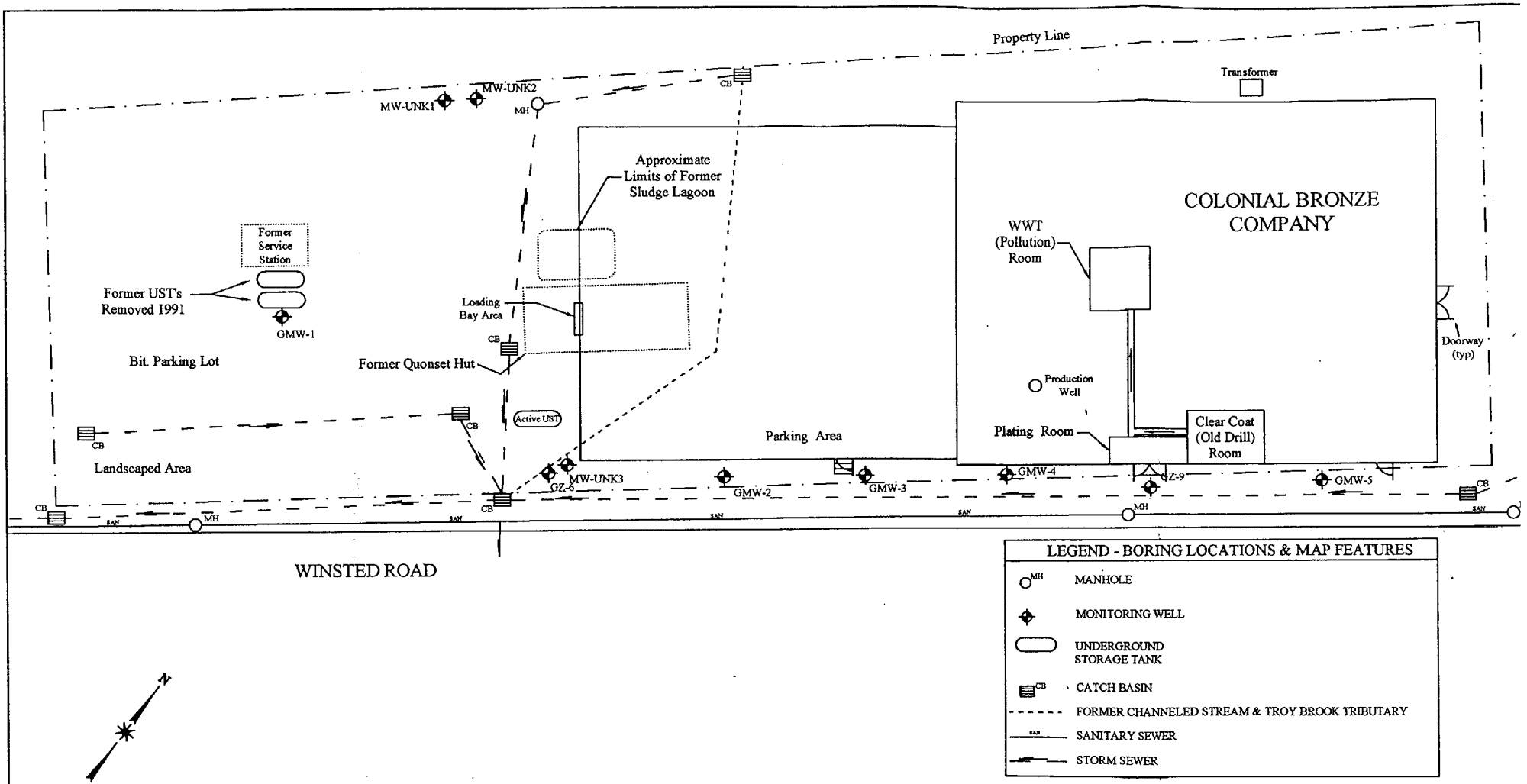
State of Connecticut Regulation of Department of Environmental Protection concerning Remediation Standard

State of Connecticut Department of Environmental Protection (2003) Proposed Revisions Connecticut's Remediation Standard Regulations Volatilization Criteria, dated March 2003

Locations where References may be found: EPA - New England, 1 Congress Street, Boston, MA

Contact telephone and e-mail numbers (name) Stephanie Carr
(phone #) 617/918-1363
(e-mail) carr.stephanie@epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.



Map modified from *SITE PLAN, Colonial Bronze, Inc.* (1996) by Borghesi, Inc. and from *Colonial Bronze Site Plan* (1992 & 1996) by GZA, Inc.

CAD: 2003-076-Figure 2.dwg

CEE CONSULTING ENVIRONMENTAL ENGINEERS, INC.

Site Plan - Colonial Bronze Company
511 Winstead Road
Torrington, Connecituct

Drawn By: CLW	Job No.: 2003.06
Checked By: KSB	Date: 06-29-0
	Figure No.: