NUS CORPORATION
19 CROSBY DRIVE
BEDFORD, MASSACHUSETTS 01730
617-275-2970

July 24, 1991
C-583-7-1-239

**Final Screening Site Inspection**
**Republic Steel (Union Drawn Div.)**
**East Hartford, Connecticut**

**TDD No. F1-9010-05**
**Reference No. $375CTD3I$**
**CERCLIS No. CTD001159490**

## INTRODUCTION

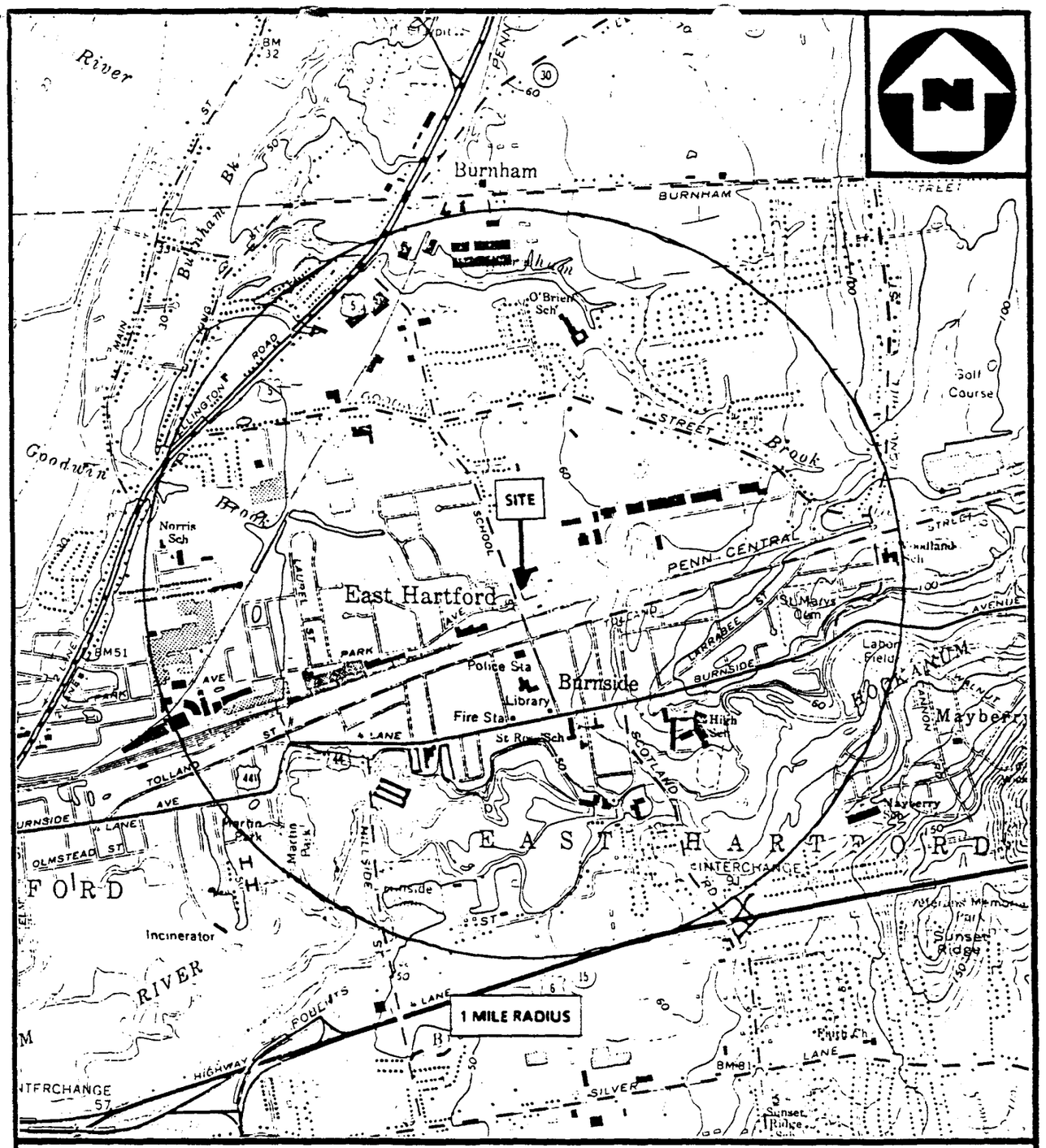
The NUS Field Investigation Team (NUS/FIT) was requested by the Region 1 U.S. Environmental Protection Agency (EPA) Waste Management Division to perform a Screening Site Inspection of Republic Steel (Union Drawn Div.) in East Hartford, Connecticut. All tasks were conducted in accordance with the Technical Directive Document (TDD) No. F1-9010-05 which was issued to NUS/FIT on October 22, 1990. NUS/FIT completed a Preliminary Assessment of this property in September 1987. On the basis of information provided in this Preliminary Assessment, the Republic Steel (Union Drawn Div.) Screening Site Inspection was initiated.

Background information used in the generation of this report was obtained through file searches conducted at the Connecticut Department of Environmental Protection and at the EPA. Information was also collected during the NUS/FIT site reconnaissance performed January 3, 1991.

This package follows guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, commonly referred to as Superfund. However, these documents do not necessarily fulfill the requirements of other EPA regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other federal, state or local regulations. Screening Site Inspections are intended to provide a preliminary screening of sites to facilitate EPA's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

## SITE DESCRIPTION

The Republic Steel (Union Drawn Div.) property is at 164 School Street in East Hartford, Connecticut (Figure 1) (Latitude 41° 47' 05"N, Longitude 72° 36' 50" W) (NUS/FIT 1987). The property, herein referred to as Republic Steel, is also named LTV Steel Company according to the U.S. EPA CERCLA Site Alias List (U. S. EPA 1988). The 22-acre property was the site of a steel bar cold finishing plant from 1944 to 1984. From 1944 to 1964 Republic Steel discharged waste pickle liquor to a lagoon located on the eastern side of the property (Figure 2) (ERL 1988). Because waste




**BASE MAP IS A PORTION OF THE FOLLOWING 7.5' U.S.G.S. QUADRANGLE(S):**

HARTFORD NORTH, CT., 1964 PHOTOREVISED 1984; MANCHESTER, CT., 1963 PHOTOREVISED 1968.

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

CONNECTICUT

QUADRANGLE LOCATION

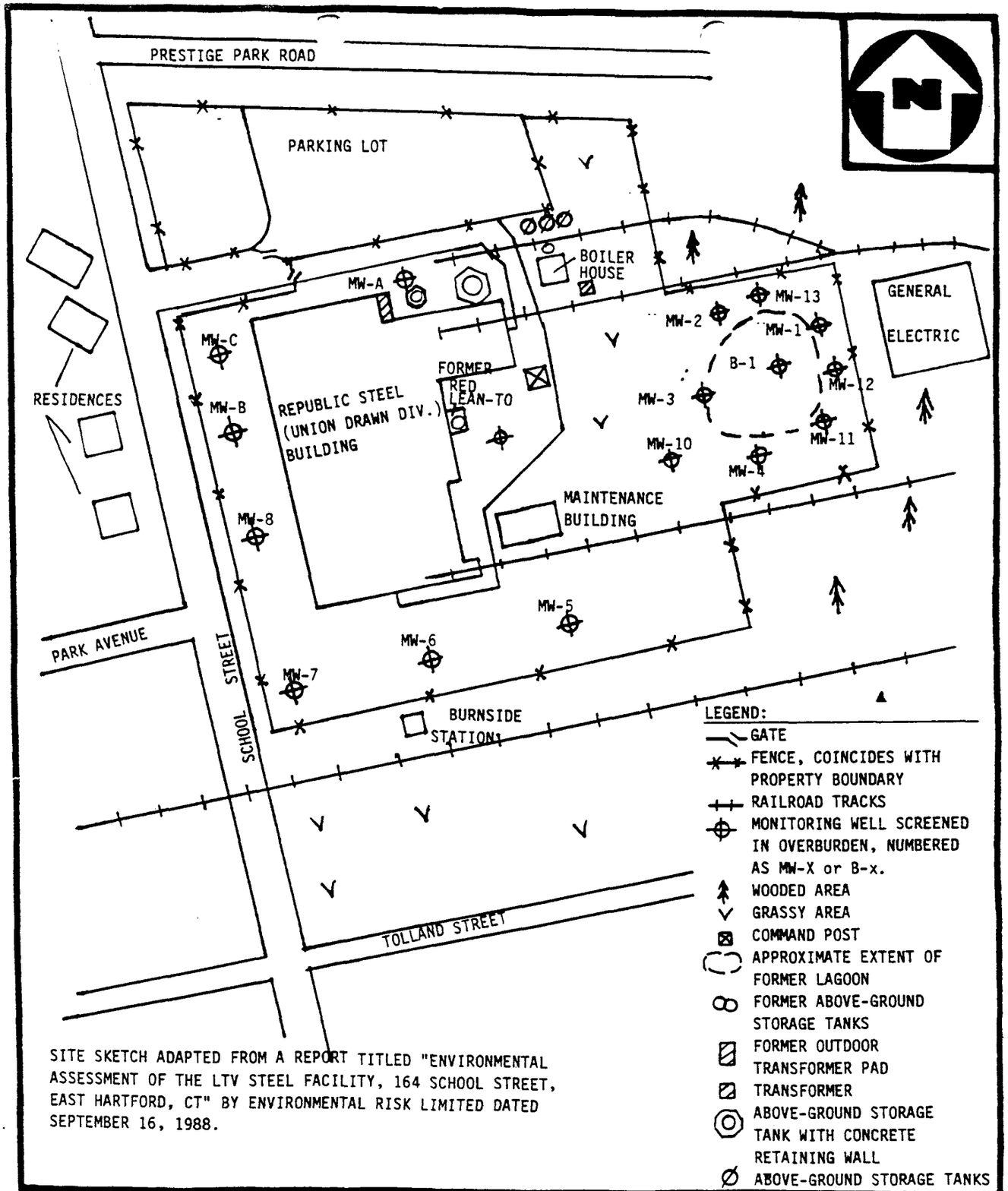
## LOCATION MAP

REPUBLIC STEEL (UNION DRAWN DIV.)

EAST HARTFORD, CONNECTICUT

NUS CORPORATION

**FIGURE 1**




SITE SKETCH ADAPTED FROM A REPORT TITLED "ENVIRONMENTAL ASSESSMENT OF THE LTV STEEL FACILITY, 164 SCHOOL STREET, EAST HARTFORD, CT" BY ENVIRONMENTAL RISK LIMITED DATED SEPTEMBER 16, 1988.

**SITE SKETCH**

REPUBLIC STEEL (UNION DRAWN DIV.)

EAST HARTFORD, CT

NUS CORPORATION

**FIGURE 2**

pickle liquor sludge is associated with high levels of lead and hexavalent chromium, and because chlorinated solvents have been detected in groundwater monitoring wells on the property, this property is listed in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) (U.S. EPA 1984).

The buildings on the property consist of a 75,000 $ft^2$ former steel finishing building, a maintenance building, and a boiler house (Figure 2) (ERL 1988; NUS/FIT 1991c). The property is currently vacant. Fencing surrounds the property on all sides. During the NUS/FIT site reconnaissance, the southern railroad spur was open, and damaged fencing was also observed elsewhere along the eastern property boundary (NUS/FIT 1991d). In addition, evidence of children playing on the property (broken hockey sticks and footprints) was observed between the two northern railroad spurs (NUS/FIT 1991d). Table 1 describes all identified and potential source areas of contamination on the property.

TABLE 1
SOURCE EVALUATION

| Potential Source Area | Containment Factors | Spatial Location |
|---|---|---|
| Surface impoundment (waste pickle liquor area) | No liner, groundwater monitoring system | Formerly located on eastern side of the property |
| Transformer pad | Unknown | Adjacent to northern side of main building |
| Polychlorinated Biphenyl (PCB) contaminated area | Asphalt pavement | Along southern railroad spur inside main building |
| Sulfuric acid above-ground storage tank | None | Unknown |
| Transformer | Intact structure | Northeast of main building |
| Main building | Intact structure | Western side of property |

(CT DEP 1986b; ERL 1988; Zlotnick 1988)

Other potential source areas of contamination include Dynage Inc., Fotomat, Bausch & Lomb Astronomical Telescope, CT Business Systems, and J. D. Office Furniture Service Inc. all located on Prestige Park Road. BKM Renewal Services and PGP Industries, Inc. are also within 1 mile of the property.

These companies are listed as hazardous waste generators under RCRA (U.S. EPA 1991).

**SITE ACTIVITY/HISTORY**

The ownership history of the property is summarized in the following table.

| Owner | Use | Years of ownership | Years of operation |
|---|---|---|---|
| School Street Ventures | Awaiting use as warehousing and office space | 1988 to Present | None |
| LTV Steel Corp. | Steel bar finishing plant | 1984-1988 | 1984-1985 |
| Republic Steel | Steel bar finishing plant | 1944-1984 | 1944-1984 |
| Unknown | Farmland | Prior to 1944 | Prior to 1944 |

(ERL 1988; Hanley 1990; NUS/FIT 1991b).

Republic Steel finished steel bars for auto parts and gun barrels (CT DEP 1986b). One step in this process is descaling, removing the oxide scale, from the steel bars. Between 1944 and 1964, Republic Steel removed the oxide scale with a sulfuric acid solution ($H_2SO_4$) (NUS/FIT 1987). This process is known as pickling and the spent solution is called pickle liquor. After the pickling process was completed, the pickle liquor was neutralized with soda ash ($Na_2CO_3$) and disposed of to the pickle liquor lagoon formerly located on the eastern side of the property (ERL 1988). After 1964, the pickling process was replaced by a new finishing process that removed the oxide scale by blasting the steel bars with abrasive metal shot, known as shot blast (ERL 1988). Between 1964 and 1985, waste shot blast was also disposed of to the pickle liquor lagoon (NUS/FIT 1987).

No chlorinated degreasing solvents were used on the property according to former LTV Steel Company personnel (ERL 1988). A hazardous waste inspection performed in 1984 indicates that a substance called 'Penetone' was used to wipe down machines in the machine shop (CT DEP 1984a).

Table 2 summarizes the types and quantities of wastes potentially present on the Republic Steel property.

TABLE 2
HAZARDOUS WASTE QUANTITY

| Substance | Volume/Area | Years of Disposal | Years of Use/ Storage | Source Area |
|---|---|---|---|---|
| Pickle liquor sludge | 8016 yd3* | 1944-1964 | N/A | Waste pickle liquor lagoon |
| Waste shot blast | 104 55-gallon drums/year | 1964-1985 | N/A | Waste pickle liquor lagoon |
| Sulfuric Acid | Unknown | N/A | 1944-1964 | N/A |
| PCBs | 50 x 20 feet | Unknown | Unknown | Along southern railroad spur inside main building |
| "Penetone" | Unknown | N/A | Unknown | Machine shop; not clear whether this was located in the main building or in storage building |

N/A Not Applicable

* This volume is the *total* volume of pickle liquor sludge and shot blast material excavated from the pickle liquor lagoon in 1988 by Ensco Environmental Services.

(CT DEP 1984a, 1984b; ERL 1988; Zlotnick 1987b, 1988; NUS/FIT 1987)

The following is a summary of work performed on the property.

* On February 14, 1984 the CT DEP performed a Hazardous Waste Inspection of the property to examine the company's practice of hazardous waste handling (CT DEP 1984a).

* On April 26, 1984, the CT DEP performed a Hazardous Waste Inspection at the Republic Steel property. The inspection noted that Republic Steel did not have a letter of authorization to dispose of grinding wastes on the property. Two samples of lagoon material were collected, one of which was analyzed for EP Toxicity (CT DEP 1984b).

* On January 31, 1985 the LTV Steel Company permanently ceased all operations at the Republic Steel property (LTV 1986).

* On June 21, 1985 TRC Environmental Consultants, Inc. completed a report titled "LTV School Street Site Investigation." The investigation included collection of four groundwater samples and one soil sample at the Republic Steel property. The report concluded based on total constituent analysis of metals in the soil, that leachate generated by the soil would contain concentrations of chromium and lead in excess of 30 times the state drinking water standards (TRC 1985).

* On July 9, 1985, Republic Steel filed a Notification of Hazardous Waste Site form with the U.S. EPA (LTV 1985).

* From May to September 1986, TRC Environmental Consultants, Inc. performed a 'clean-up' of the Republic Steel property. This action included removal of one 1,000-gallon gasoline underground storage tank on the north side of the main building, one above-ground sulfuric acid tank (size and location unknown), and a Number two fuel oil tank from the red lean-to (size unknown). These former structures are depicted on Figure 2. Soil samples were collected from a former red lean-to, the sulfuric acid tank area (unknown location), and the northern side of the main building where stained soils were observed (ERL 1988; Palmer 1986; Zlotnick 1987a; CT DEP 1986b). Oil-contaminated soil in the red lean-to area was excavated, removed from the property, and disposed of to the East Hartford Landfill (Palmer 1986). An above-ground 20,000 gallon Number Six fuel oil storage tank was located north of the boiler room (ERL 1988). No information regarding when this tank was emptied or removed is available in file information.

* On November 13, 1986, the CT DEP performed an inspection of the Republic Steel property. Four samples were collected by the CT DEP: two samples of waste shot blast from inside the building and two soil samples from the sulfuric acid tank excavation area. One sample from each location was tested for EP Toxicity for six metals (CT DEP 1986b). Several structures were observed on the property during this inspection: one Number two fuel oil storage tank (20,000 gallons), one Number two fuel oil storage tank (60,000 gallons), and four transformers on concrete pads. All three were located on the northern side of the building (Figure 2) (ERL 1988). In addition, three above-ground storage tanks of unknown location were observed on the property: one propane tank, one nitrogen tank, and one Number Four fuel oil storage tank of unknown size (CT DEP 1991).

* On September 16, 1987, NUS/FIT performed a Preliminary Assessment of the Republic Steel property. The report recommended a site inspection at a medium priority (NUS 1987).

* Between 1987 and 1988, TRC Environmental Consultants, Inc. and Environmental Risk Limited and the CT DEP PCB Section

sampled the machine pits and both railroad spur areas inside the main building. PCBs were detected in sludge from these areas at concentrations up to 66.7 parts per million (ppm) (ERL 1988). Remedial actions have been taken by TRC Environmental Consultants on these areas (ERL 1988).

* On January 6, 1988, TRC Environmental Consultants and Environmental Risk Limited collected confirmation groundwater samples from MW-8 and MW-10. The samples were analyzed for volatile organic compounds (VOCs) (ERL 1988).

* From May 9 through 20, 1988 the pickle liquor lagoon material was excavated and removed by Ensco Environmental Services, Inc. (contractor to TRC Environmental Services) to the East Hartford Landfill. Following the excavation, TRC Environmental Consultants and Environmental Risk Limited each collected four confirmation soil samples from the former lagoon area. The samples were analyzed for EP Toxicity for eight metals (ERL 1988, Zlotnick 1988).

* On September 16, 1988 Environmental Risk Limited completed a report titled "Environmental Assessment of the LTV Steel Facility, 164 School Street, East Hartford, Connecticut" for Rome, Case, Kennelly, and Klebanoff, P.C. As a part of the assessment, 12 monitoring wells were installed on the property and soil and groundwater samples were collected from the spent pickle liquor lagoon and from areas around the lagoon (ERL 1988).

* On January 3, 1991 NUS/FIT performed a site reconnaissance at the Republic Steel property. No areas of stained soils were observed during this effort (NUS/FIT 1991f).

Based upon the availability and completeness of sample analysis data, the EPA determined that sampling was not required for the completion of this report.

The Republic Steel property holds no Resource, Conservation, and Recovery Act (RCRA), National Pollution Discharge Elimination System (NPDES), or other permits (US EPA 1991; US EPA 1990). On December 12, 1989, the RCRA status of Republic Steel was changed from a generator to non-handler of hazardous waste (Bowe 1989).

**ENVIRONMENTAL SETTING**

The land within a 1-mile radius of the Republic Steel property is used for residential, industrial, and commercial purposes (Figure 1) (ERL 1988; NUS/FIT 1991e). The nearest occupied residences are on School Street directly across the street from Republic Steel, approximately 100 feet east of the property (Figure 2) (NUS/FIT 1991c). The nearest private wells are approximately 1.3 miles northeast of the property along Burnham Street, Sherwood Drive, and Long Hill Street

(MDC 1989).

Republic Steel is located within the physiographic province of the Central Lowlands of Connecticut. Overburden underlying the Republic Steel property is composed of the following strata, as measured from the ground surface to the bedrock surface at soil boring B-1: 10 feet of fine to medium brown sand and humus; 20 feet of medium to coarse light brown to orange sand; 100 feet of clay; 20 feet of gravel; and 5 feet of till (TRC 1985).

Bedrock in the area consists of the Portland Arkose Formation, an arkosic siltstone and shale (ERL 1988). The depth to bedrock below Republic Steel is approximately 165 feet (TRC 1985).

The depth to groundwater in overburden below the property is 6 feet (TRC 1985). The direction of groundwater flow below the property has been determined to be towards the southwest at a gradient of 0.0015 feet/foot (TRC 1985). The groundwater below the property is classified by the State of Connecticut as GB (CT DEP 1991).

The total population served by drinking water from public and private groundwater sources located within 4 miles of the property is estimated to be 23,364 (CT DEP 1982, 1986a; Hanley 1991b, 1991d - j; Jalkut 1990c; Kulju 1989a; Young 1990). Table 3 tabulates all public groundwater supply sources within a 4-mile radius of the Republic Steel property. Table 4 tabulates the private supply wells in the Towns of East Hartford, Windsor, South Windsor, Manchester, Glastonbury, and the City of Hartford that are within a 4-mile radius of the Republic Steel property.

Surface water from the Republic Steel property that enters catch basins along School Street north of Park Avenue and along Prestige Park Road flows to Goodwin Brook where it crosses under School Street. Surface water from the property that enters catch basins on School Street, south of Park Avenue, flows into the Hockanum River (Hanley 1991k). Goodwin Brook flows west approximately 1.5 miles to its confluence with the Podunk River. The Podunk River flows 2,000 feet south to the Connecticut River. The Connecticut River flows south past a point in Cromwell, Connecticut located 15 miles downstream of Republic Steel (USGS 1984a, 1984b, 1972, 1984c).

The mean flow rate of the Podunk River at Vinton's Pond, South Windsor in 1977 was 19.3 cubic feet/second (cfs) (USGS 1978). The mean flow rate of the Connecticut River in East Hartford in 1977 was 146 cfs (USGS 1978). The Republic Steel property lies in an area of minimal flooding (FEMA 1981).

TABLE 3
PUBLIC GROUNDWATER SUPPLY SOURCES WITHIN 4 MILES OF REPUBLIC STEEL (UNION DRAWN DIV.)

| Distance/ Direction from Republic Steel | Source Name | Location of Source | Estimated Population Served | Source Type |
|---|---|---|---|---|
| 2.7 miles SSW | Pratt & Whitney | East Hartford | Unknown | 2 wells Screen unknown Depth: unknown |
| 3.6 miles SE | Redwood Farms (L & M Water Co.) | Manchester | 500 | 3 wells Dug in bedrock Depth: #1 300 feet #2 150 feet #3 150 feet (unused) |
| 2.5 miles NE | Burnham Acres | South Windsor | 160 | 2 wells Dug in bedrock Depth: #1 480 feet #2 530 feet |
| 3.8 miles E | Manchester Water Department Well #5 | Manchester | 4,134 | 1 well Dug in bedrock Depth: #5 800 feet |
| 4.0 miles E | Manchester Water Department Wells #6, #7, and #8 | Manchester | 12,403 | 3 wells Screened in overburden Depth: unknown |
| | | Total: | 17,197 | |

(CT DEP 1982, 1986a, 1991; Hanley 1991b, 1991j; Jalkut 1990c; Kulju 1989a; NUS/FIT 1991a; Young 1990)

TABLE 4

POPULATION SERVED BY PRIVATE GROUNDWATER SOURCES LOCATED WITHIN 4 MILES OF REPUBLIC STEEL (UNION DRAWN DIV.)

| Distance ring (miles) | Population served by private sources |
|---|---|
| 0.00-0.25 | 0 |
| 0.25-0.50 | 0 |
| 0.50-1.00 | 0 |
| 1.00-2.00 | 3,554 |
| 2.00-3.00 | 1,166 |
| 3.00-4.00 | 1,447 |
| TOTAL: | 6,167 |

(Hanley 1991b, 1991d - j; NUS/FIT 1991a)

Due to the small size of Goodwin Brook, it is not used for swimming or canoeing, and it is unlikely that it is used for fishing (Hanley 1991c). The Podunk River is used for fishing and is stocked with trout by the State of Connecticut; however, the section below its confluence with Goodwin Brook is difficult to access and it flows through private land (Hanley 1991c; Jalkut 1990b). The Connecticut River is used for boating and fishing (Hanley 1991a; Kulju 1989b, 1989c). These surface water bodies are not used as public drinking water supplies (Jalkut 1990a). The State of Connecticut surface water classifications of Goodwin Brook, the Podunk River, and the Connecticut River are A, A/B, and SC/SB, respectively (CT DEP 1991).

The total acreage of wetlands within a 1-mile radius of Republic Steel is approximately 6.5 acres (USGS 1984c, 1984b).

**RESULTS**

Samples from the Republic Steel property have been collected by two consultants and the CT DEP. Results for these samples are organized by consultant or agency first, then by matrix. Table 5 summarizes the maximum concentrations of elements and compounds detected in groundwater samples collected from each monitoring well on the Republic Steel property.

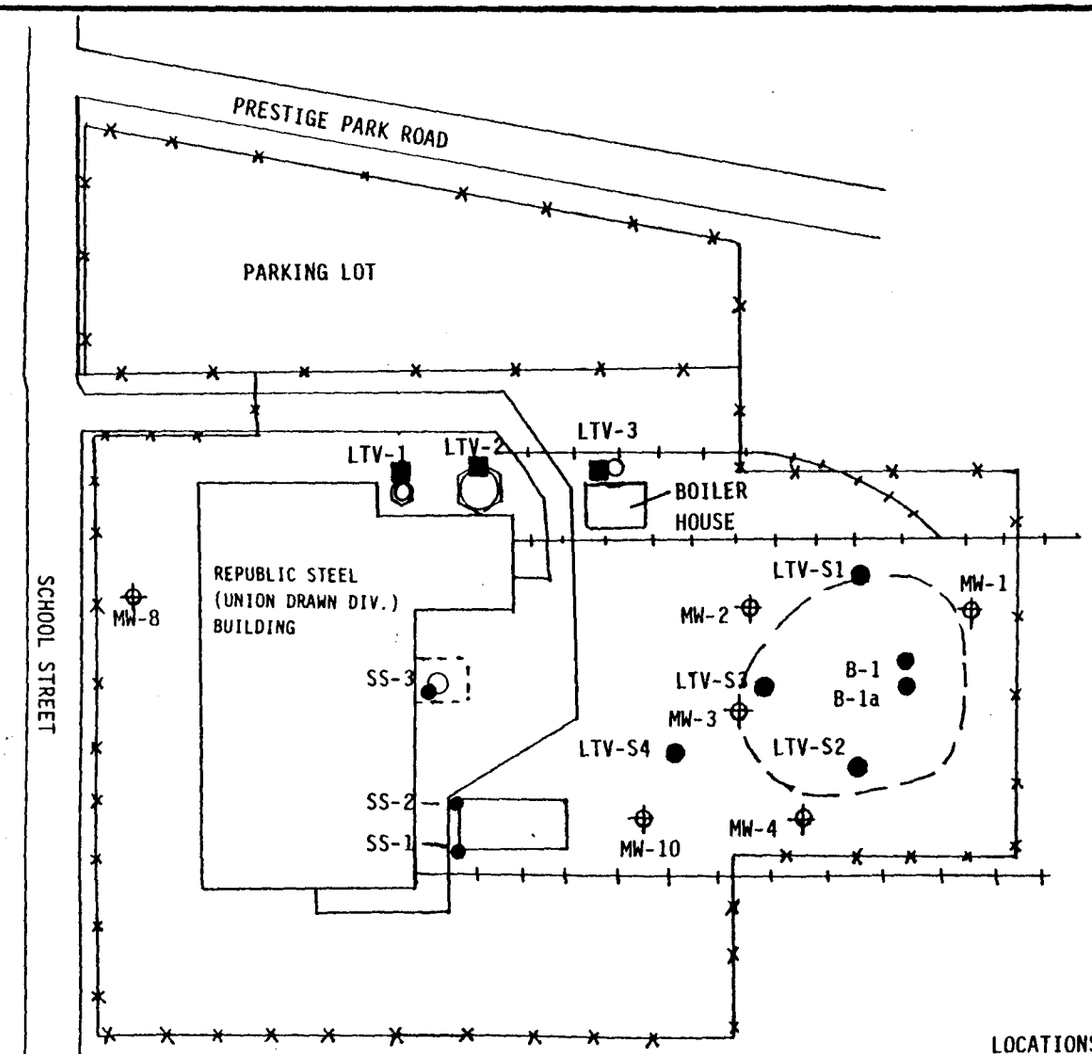
TRC Environmental Consultants Sampling Results

Between May 1985 and May 1988, TRC Environmental Consultants (TRC) collected groundwater samples from monitoring wells MW-1, MW-2, MW-3, MW-4, MW-8, and MW-10 and soil samples from

the pickle liquor lagoon (B-1, B-1a, LTV-S1, LTV-S2, LTV-S3, and LTV-S4), the storage shed (SS-1 and SS-2), the red lean-to (SS-3), and from below a sulfuric acid tank (SS-5, SS-6) (ERL 1988; TRC 1985; Palmer 1986). In addition, TRC collected three samples of liquids from three above-ground fuel oil storage tanks (in September 1987) and three samples of soil from near these three tanks (in December 1986). Both the liquid samples and the soil samples are designated in file information as LTV-1, LTV-2, AND LTV-3 (Zlotnick 1987a, 1987c). The locations of all samples collected by TRC are depicted on Figure 3, with the exception of soil samples SS-5 and SS-6 because the location of the sulfuric acid tank is unknown.

TABLE 5
GROUNDWATER SAMPLE RESULTS SUMMARY TABLE
REPUBLIC STEEL (UNION DRAWN DIV.)
SAMPLES COLLECTED BY TRC ENVIRONMENTAL CONSULTANTS AND
ENVIRONMENTAL RISK LIMITED BETWEEN MAY 1985 AND MAY 1988

| Well Number | Compound/ Element | Maximum Concentration | Attachment | Consultant/ Analysis Date | U.S. EPA Maximum Contaminant Level |
|---|---|---|---|---|---|
| Matrix: Groundwater | | | | | |
| MW-1 | Zinc | 0.05 ppm | A | TRC/5-85 | - |
| MW-2 | Cadmium | 0.0116 ppm | A | TRC/5-85 | 0.01 ppm |
| | Lead | 0.0019 ppm | A | TRC/5-85 | 0.05 ppm |
| | Zinc | 0.03 ppm | A | TRC/5-85 | - |
| MW-3 | Lead | 0.0024 ppm | A | TRC/5-85 | 0.05 ppm |
| | Zinc | 0.03 ppm | A | TRC/5-85 | - |
| MW-4 | Lead | 0.0029 ppm | A | TRC/5-85 | 0.05 ppm |
| | Zinc | 0.03 ppm | A | TRC/5-85 | - |
| MW-7 | 1,1,1-Trichloroethane | 5.8 ppb | C | ERL/12-87 | 200 ppb |
| | Trichloroethylene | 1.9 ppb | C | ERL/12-87 | 5.0 ppb |
| | Tetrachloroethylene | 3.5 ppb | C | ERL/12-87 | - |
| MW-8 | Trichloroethylene | 404.0 ppb | C | ERL/12-87 | 5.0 ppb |
| | 1,1-dichloroethylene | 4.6 ppb | C | ERL/12-87 | 7.0 ppb |
| | 1,1-dichloroethane | 2.1 ppb | C | ERL/12-87 | - |
| | Trans-1,2-dichloroethylene | 52.0 ppb | C | ERL/12-87 | - |
| | 1,1,1-trichloroethane | 12.3 ppb | C | ERL/2-88 | 200 ppb |
| MW-9 | Tetrachloroethylene | 8.0 ppb | C | ERL/12-87 | - |
| MW-10 | Trichloroethylene | 20.3 ppb | C | ERL/1-88 | 5.0 ppb |
| | Tetrachloroethylene | 963.0 ppb | C | ERL/1-88 | - |
| | 1,1,1-trichloroethane | 3.0 ppb | C | ERL/4-88 | 200 ppb |




LEGEND:

- FENCE
- RAILROAD TRACKS
- MONITORING WELL SCREENED IN OVERBURDEN, NUMBERED AS MW-x
- FORMER LOCATION OF RED LEAN-TO
- FORMER ABOVE-GROUND STORAGE TANK
- FORMER ABOVE-GROUND STORAGE TANK WITH CONCRETE RETAINING WALLS
- LIQUID SAMPLE LOCATION, NUMBERED AS LTV-x
- SOIL SAMPLE, NUMBERED AS SS-x AND B-x
- APPROXIMATE EXTENT OF FORMER LAGOON

NOT TO SCALE

LOCATIONS ADAPTED FROM ENVIRONMENTAL RISK LIMITED REPORT TITLED "ENVIRONMENTAL ASSESSMENT OF THE LTV STEEL FACILITY, 164 SCHOOL STREET, EAST HARTFORD, CT." DATED 9-16-88.

FIGURE 3

TRC SAMPLE LOCATIONS

REPUBLIC STEEL (UNION DRAWN DIV.)

EAST HARTFORD, CT

NUS CORPORATION

FIGURE 3

| | | | | | |
|---|---|---|---|---|---|
| MW-A | Trans-1,2-dichloroethylene | 10.0 ppb | C | ERL/4-88 | - |
| | 1,1,1-trichloroethane | 11.0 ppb | C | ERL/4-88 | 200 ppb |
| | Trichloroethylene | 110.0 ppb | C | ERL/4-88 | 5.0 ppb |
| MW-C | Trans-1,2-dichloroethylene | 4.0 ppb | C | ERL/4-88 | - |
| | 1,1,1-trichloroethane | 5.0 ppb | C | ERL/4-88 | 200 ppb |
| | Trichloroethylene | 35.0 ppb | C | ERL/4-88 | 5.0 ppb |

ppb - parts per billion
ppm - parts per million
TRC - TRC Environmental Consultants
ERL - Environmental Risk Limited

(ERL 1988; NARA 1989; TRC 1985)

Analyses of the groundwater samples detected cadmium (0.0116 ppm) at a concentration exceeding the U.S. EPA Maximum Contaminant Level (MCL) for cadmium. Complete results for groundwater samples collected by TRC are located in Attachments A and B.

Analysis of soil samples SS-1, SS-2, and SS-3 collected on June 5, 1986 indicated total petroleum hydrocarbon concentrations ranging between 734 ppm and 146,000 ppm prior to the removal of oil-contaminated soil from this area. These samples were collected at depths ranging between 0.0 to 1.0 feet. Analysis of soil samples SS-1, SS-2, and SS-3 collected on July 9, 1986 (after the oil-contaminated soil was removed) indicated that soil samples contained total petroleum hydrocarbons between 1,340 ppm to 7,280 ppm (Palmer 1986). These samples were collected at the following depths: SS-1, 1.5 - 1.7 feet; SS-2, 1.5 -1.7 feet; SS-3, 11.0 -11.2 feet. Analysis of soil sample B-1 indicated total concentrations of arsenic (21.3 ppm), chromium (799 ppm), nickel (306 ppm), copper (428 ppm), zinc (25.8 ppm), and lead (173 ppm) (TRC 1985; ERL 1988). Mercury (0.0010 ppm) was detected in soil sample SS-5 (Palmer 1986). Complete results for soil samples collected by TRC are located in Attachments E and F.

Laboratory analyses of the three liquid samples indicated the presence of PCBs in liquid sample LTV-3. The amount and type of PCBs could not be quantified nor identified in the analysis. The following substances were detected in one or more of the three liquid samples: toluene (up to 110,000 ug/kg), ethylbenzene (up to 56,000 J ug/kg), benzene (580 ug/kg), tetrachloroethene (270 J ug/kg), lead (up to 31 mg/kg), cadmium (0.014 mg/kg), and chromium (up to 7.8 mg/kg) (Zlotnik 1987c). Compound concentrations qualified with a

"J" are estimated values. Complete results for liquid samples collected by TRC are located in Attachment D.

Environmental Risk Limited Sampling Results

Between December 1987 and January 1988, Environmental Risk Limited (ERL) collected twenty-two groundwater samples from monitoring wells MW-1, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, MW-A, MW-B, and MW-C on the Republic Steel property (Table 5) (ERL 1988). A total of eight soil samples (MB-10a, MB-10b, MB-11, MB-12, B-1, B-2, B-3, and B-4) were collected near the waste pickle liquor lagoon and eleven soil samples (LTV-1 through LTV-11) were collected adjacent to the northern and southern railroad spurs inside the main building (ERL 1988). The locations of these monitoring wells and soil samples are depicted on Figure 4.

Analyses of groundwater collected from MW-8, MW-10, MW-A, and MW-B detected trichloroethylene at concentrations exceeding the MCL for trichloroethylene (5.0 ppb) (NARA 1989). Complete results for groundwater samples collected by ERL are located in Attachment C.

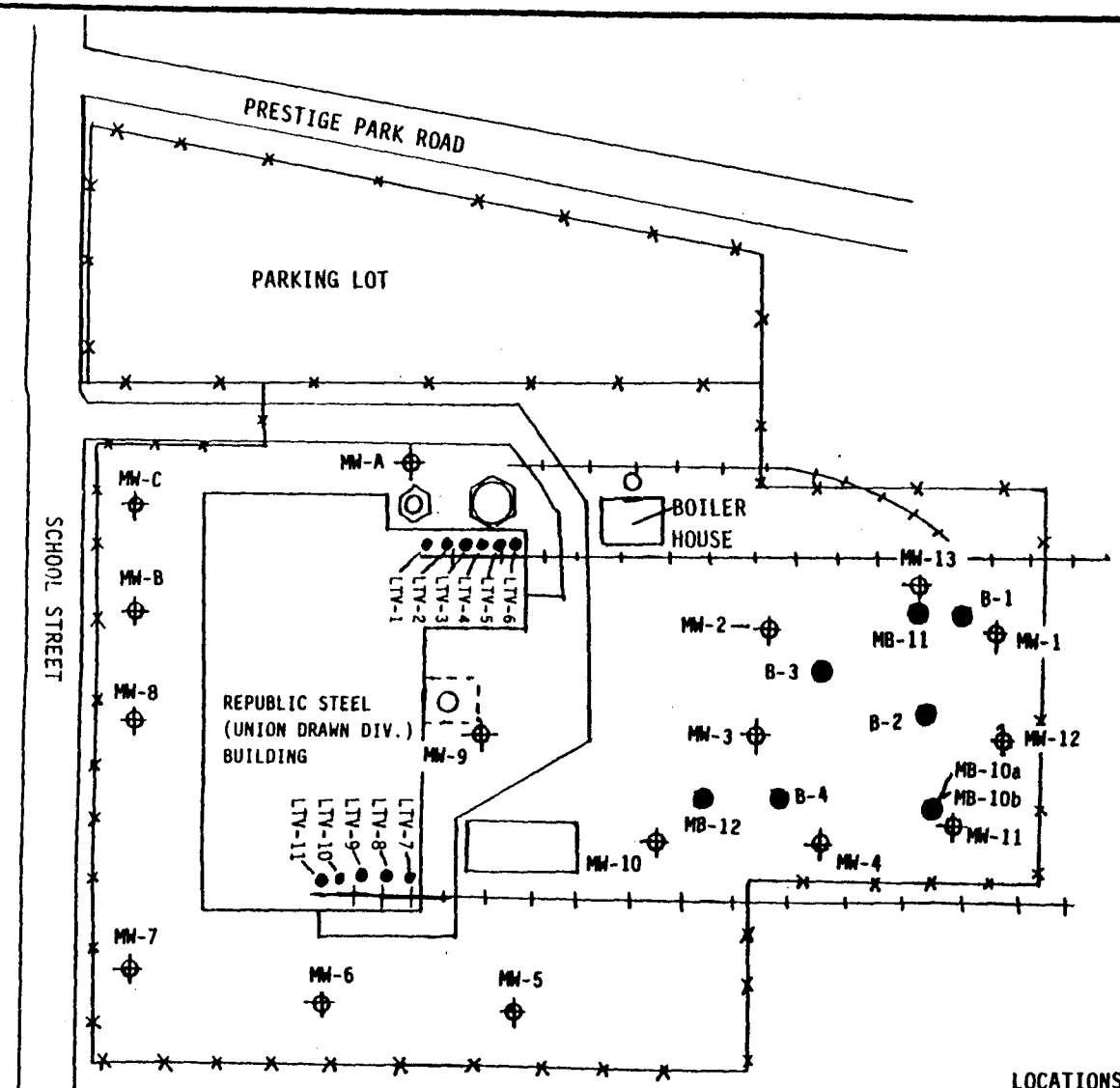
PCBs were detected in soil samples LTV-7, LTV-8, LTV-9, LTV-10, and LTV-11 at concentrations ranging from 12.4 ppm to 39.6 ppm (ERL 1988). Complete results for soil samples collected by ERL are located in Attachment H.

CT DEP Sampling Results

On April 26, 1984, the CT DEP collected two samples of lagoon material from the property and analyzed one of these samples for EP Toxicity. The analysis detected chromium (0.01 milligrams per kilogram (mg/kg)), copper (0.01 mg/kg), iron (49 mg/kg), nickel (0.21 mg/kg), zinc (0.09 mg/kg), and barium (0.03 mg/kg) (CT DEP 1991).

On November 13, 1986, the CT DEP collected two soil samples (5785 and 5786) from the former sulfuric acid tank area on the Republic Steel property, and two waste shot blast samples (5783 and 5784). Samples 5783 and 5785 were analyzed by the Connecticut Department of Health for EP Toxicity (copper, cadmium, chromium, nickel, lead, and zinc) (CT DEP 1986b). The complete results of the analyses are available in Attachment G.

Analysis of soil sample 5785 detected concentrations of cadmium (0.01 mg/l), copper (0.02 mg/l), nickel (0.52 mg/l), and zinc (0.38 mg/l) (CT DEP 1986b). Analysis of the waste shot blast sample 5783 indicated concentrations of cadmium (0.04 mg/l), copper (0.04 mg/l), nickel (0.51 mg/l), and zinc (0.50 mg/l).




NOT TO SCALE

**LEGEND:**

- FENCE
- RAILROAD TRACKS
- MONITORING WELL SCREENED IN OVERBURDEN, NUMBERED AS MW-x
- FORMER LOCATION OF RED LEAN-TO
- FORMER ABOVE-GROUND STORAGE TANK
- FORMER ABOVE-GROUND STORAGE TANK WITH CONCRETE RETAINING WALLS
- SOIL SAMPLE LOCATION, NUMBERED AS MB-x, LTV-Sx, B-x, and LTV-x

LOCATIONS ADAPTED FROM ENVIRONMENTAL RISK LIMITED REPORT TITLED "ENVIRONMENTAL ASSESSMENT OF THE LTV STEEL FACILITY, 164 SCHOOL STREET, EAST HARTFORD, CT." DATED 9-16-88.

ERL SAMPLE LOCATIONS

REPUBLIC STEEL (UNION DRAWN DIV.)

EAST HARTFORD, CT

NUS CORPORATION

FIGURE 4

FIGURE 4

Results Summary

Arsenic, cadmium, chromium, copper, lead, nickel, silver, zinc, and the chlorinated VOCs detected in the groundwater collected on the property are associated with metal manufacture, treatment, and/or degreasing in the metal industry (USGS 1989). The U.S. EPA has determined that "high levels" of hexavalent chromium and lead are commonly detected in inadequately stabilized waste pickle liquor sludge (U.S. EPA 1984). Therefore; if waste pickle liquor sludge was not adequately stabilized at Republic Steel, then the presence of chromium and lead in groundwater and soil on the property may be related to disposal practices on the property.

Toluene, ethylbenzene, and benzene are often associated with hydrocarbon manufacture, refining, and/or by-products (USGS 1989). These compounds were detected in soil at Republic Steel and may be related to fuel storage on the property. The compound 1,1-dichloroethylene is used in plastics manufacture and PCBs are typically used in electrical transformers (USGS 1989; Merck 1976). Electrical transformers were used on the property within the building and outdoors on the northern side of the main building (ERL 1988). The origin of the chlorinated VOCs detected in groundwater and soil is unknown, however; tetrachloroethene was detected in one of the liquid samples collected from above-ground fuel oil storage tanks (ERL 1988). The substance 'Penetone' could not be identified through in-house references.

**SUMMARY**

The Republic Steel property is at 164 School Street in East Hartford, Hartford County, Connecticut (Latitude 41° 47' 05" N, Longitude 72° 36' 50" W). Between 1944 and 1964, the 22-acre property was used for finishing steel bars with a sulfuric acid solution (pickle liquor). The pickle liquor sludge was disposed of to a 131 ft x 84 ft x 5 ft deep lagoon formerly located on the eastern side of the property.

Analyses performed on groundwater analysis collected from the monitoring wells on the property detected chlorinated volatile organic compounds (VOCs) and elements, including: 1,1-dichloroethylene (4.6 parts per billion (ppb)), trans-1,2-dichloroethylene (up to 52.0 ppb), 1-1-1,trichloroethane (up to 12.3 ppb), trichloroethylene (up to 404.0 ppb), tetrachloroethylene (up to 963.0 ppb), cadmium (0.0116 parts per million (ppm)), zinc (up to 0.08 ppm), and lead (up to 0.0029 mg/l). Polychlorinated biphenyls (PCBs) (up to 39.6 ppm), total petroleum hydrocarbons (up to 146,000 ppm), arsenic (up to 21.3 ppm), chromium (up to 799 ppm), nickel (up to 306 ppm), copper (up to 428 ppm), zinc (up to 25.8 ppm), and lead (up to 173 ppm) were detected in soil samples

collected on the Republic Steel property.

The presence of the inorganic elements, PCBs, and petroleum-related (non-chlorinated) VOCs mentioned above are consistent with the processes and disposal practices that took place during Republic Steel operations. No direct evidence indicating the use and disposal of chlorinated VOCs on the property exists, therefore, the source of the chlorinated VOCs detected in groundwater at Republic Steel is unknown.

Remedial actions have been taken on the waste pickle liquor lagoon and the soils containing PCBs and petroleum-related VOCs at the property.

Potential receptors to contaminants include Goodwin Brook, the Podunk River, the Connecticut River, and the 6.5 acres of wetlands within a 1-mile radius of the property. Also, there are 23,364 groundwater users within a 4-mile radius of the property.

Based on the presence of cadmium and trichloroethylene in groundwater at concentrations exceeding the U.S. EPA Maximum Contaminant Levels, NUS/FIT recommends that further investigative work be conducted on the Republic Steel (Union Drawn Div.) property.

Submitted by:

Diane Hanley
Diane Hanley
Project Manager

Approval: Gary J. Glennon for
Robert Jubach
FIT Office Manager

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LIST OF ATTACHMENTS

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| ATTACHMENT A | Republic Steel (Union Drawn Div.)<br>Groundwater Sample Results<br>TRC Environmental Consultants, Inc.<br>May 15, 1985 |
| ATTACHMENT B | Republic Steel (Union Drawn Div.)<br>Groundwater Sample Results<br>Baron Consulting Company<br>January 28, 1988 |
| ATTACHMENT C | Republic Steel (Union Drawn Div.)<br>Groundwater Sample Results<br>Connecticut Testing Laboratories, Inc.<br>December 17, 1987; January 5, 1988;<br>January 28, 1988; February 18, 1988;<br>April 6, 1988 |
| ATTACHMENT D | Republic Steel (Union Drawn Div.)<br>Liquid Sample Results<br>Century Laboratories, Inc.<br>September 10, 1987 |
| ATTACHMENT E | Republic Steel (Union Drawn Div.)<br>Soil Sample Results<br>1) TRC Environmental Consultants, Inc.<br>May 15, 1985 and June 12, 1985<br>2) Baron Consulting Company<br>May 23, 1988 |
| ATTACHMENT F | Republic Steel (Union Drawn Div.)<br>Soil Sample Results<br>1) TRC Environmental Consultants, Inc.<br>June 5, 1986 and July 9, 1986<br>2) Baron Consulting Company<br>December 1986 |
| ATTACHMENT G | Republic Steel (Union Drawn Div.)<br>Soil Sample Results<br>Connecticut Department of Health Services<br>November 13, 1986 |
| ATTACHMENT H | Republic Steel (Union Drawn Div.)<br>Soil Sample Results<br>Connecticut Testing Laboratories, Inc.<br>December 7, 1987 and May 23, 1988 |