RCRA RECORDS CENTER
FACILITY Ball + Socket MFG
I.D. NO. CTD001167493
FILE LOC. R-13
OTHER #103229

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: **Ball and Socket Manufacturing Co. (former)**
Facility Address: **493 West Main Street, Cheshire, CT 06410**
Facility EPA ID #: **CTD001167493**

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?

   __Y__ 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.

RDMS DocID 103229

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EIs) 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 EIs 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 EIs 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 the 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).

FACILITY INFORMATION

Site History/Background

The Ball and Socket Manufacturing Co. (former) site is located at 493 West Main Street in Cheshire, New Haven County, Connecticut. The Ball and Socket site includes the former Ball and Socket Facility property (which consists of approximately 3.02 acres), the former Ball and Socket Lagoon property (which consists of approximately 3.7 acres), and the abutting property formerly owned by the Pennsylvania Central Railroad (which consists of approximately 3.62 acres).

The Town of Cheshire Tax Assessor's Office lists the owner of the Facility, Lagoon, and railroad properties as Dalton Enterprises, Inc. (Dalton). Structures on the Ball and Socket Facility property were constructed circa 1850, and, along with the Lagoon property, were owned and operated by Ball and Socket until 1996. Dalton purchased the three properties in 1996. Buildings on the Facility property are connected to municipal water and sewer and are heated by oil. The former railroad property has been developed by Dalton since purchasing the property as a gravel access road for transport trucks. A vehicle gate separates the property, and subsequently the site, north of the former Lagoon property.

The Facility property is occupied by five buildings and are referred to their former use including the maintenance, facility, industrial wastewater treatment plant (IWTP), storage, and former boiler house buildings. The facility building was used for manufacturing metal-plated and fabric-covered buttons for garments, automobiles, and upholstery from 1850 to 1996. An asphalt paved parking lot surrounds the buildings, except to the west of the facility building which is grass covered. The

Cheshire Canal is located along the western property boundary and flows from the northeast to southwest and discharges to Willow Brook approximately 3,500 feet downstream. A process well formerly used for site process water is located adjacent to the facility building. Commercial properties are located to the west, across the canal. Residential properties are located to the east across Willow Street and to the south.

The Lagoon property is bordered by Willow Street to the east, a retail lumber company to the north, a landscaping business and furniture refinishing business to the northeast, Dalton, a manufacturer of pavement sealing compounds, to the south, and Willow Brook to the west. The canal flows north-south through the eastern portion of the Lagoon property.

The button manufacturing process included the cutting and stamping of steel and brass sheet metal, cleaning, followed by electroplating with nickel, brass, or gold. In 1945, solvent degreasing was first introduced as part of the cleaning process. From 1945 to 1950, trichloroethene (TCE) was used as the solvent. In 1950, tetrachloroethene (PCE) was used as the solvent in the cleaning process and was stored in a 600-gallon aboveground storage tank (AST) adjacent to the facility building. By 1992, the cleaning process involved the use of 1,1,1-trichloroethane (TCA) vapor degreaser.

After metal products were electroplated, they were rinsed with solvents. Metal products were also smoothed and polished in tumblers. The rinse waters from both of these processes were combined and composed the Ball and Socket facility wastewater.

Before 1958, wastewater from the Facility property was discharged directly to the canal. Between 1958 and 1970, the wastewater was discharged via a 1,500 foot ceramic pipe to a 0.75-acre unlined lagoon located on the Lagoon property.

On August 21, 1967, Ball and Socket received Order No. 303 from the CTDEP Water Resources Commission to abate pollution of the waters of Connecticut. Refer to the Site Investigation and Interim Measures section for further details.

During the early 1970s, the unused former lagoon was filled in with brown fine-grained sand obtained from excavation activities related to a Town of Cheshire sewer installation project. In addition, solid waste has been reportedly dumped illegally on the Lagoon property since the early 1970s.

In June 1984, a new IWTP was constructed on the Facility property and use of the three surface impoundments ceased. The new IWTP generated metal hydroxide sludge which was sent off site for copper and nickel reclamation. The new IWTP treated effluent was discharged to the Town of Cheshire sewer system under CTDES Permit No. WPC-025-006 issued April 12, 1984.

In 1989, a PCE degreasing unit was removed from the solvent management area in the facility building. During the removal, the concrete sump of the unit was observed to be cracked and leaking solvent assumed to contain PCE directly to the underlying soils. Subsequent investigation (see

below) identified PCE groundwater contamination.

In 1991, Ball and Socket submitted to EPA a Post-Closure Part B Application for the three surface impoundments. In accordance with the Part B application, post-closure groundwater monitoring has been conducted for this source. In 1997, Dalton requested of CTDEP to reduce the sample frequency to semi-annually and to reduce the analytical parameter list. In 1998, CTDEP granted Dalton their request.

In 1992, Ball and Socket installed an extraction well groundwater treatment system and conducted a pilot test to determine the system's feasibility. Refer to the Site Investigation and Interim Measures section for further details.

In 2005, Tetra Tech NUS, Inc. (TtNUS) conducted a series of field sampling events on the site in support of this RCRA EI determination. Refer to the Site Investigation and Interim Measures section for further details.

Site Geology and Hydrogeology

The site is located in an area of ground moraine deposits overlying (Triassic) New Haven Arkose. This bedrock unit is an arkose sandstone interbedded with conglomerates and siltstone. The Facility property stratigraphy consists of 4 to 11 feet of sand with varying amounts of silt, clay, and gravel. Bedrock is located from 4 to 11 feet bgs across the Facility property. The Lagoon property stratigraphy consists of sand and gravel to a minimum of 25 feet bgs based on boring logs. Bedrock depth is unknown on the Lagoon property.

Surface water within 1 mile of the site includes the canal and Willow Brook. The canal has been identified as a groundwater discharge point near the facility and former boiler house buildings. The nearest residence is approximately 150 feet west of the facility building. Municipal drinking water for the Town of Cheshire is provided by the South Central Regional Water Authority (SCRWA). The SCRWA has two well fields located in the Town of Cheshire that are blended together and provide drinking water to the Towns of Cheshire and Hamden. The two well fields are located within 2- to 3-radial miles and 3- to 4-radial miles from the site.

The groundwater table varies across the site from approximately 1 to 6.5 feet bgs. The direction of overburden groundwater flow across the site is to the southwest. Overburden groundwater has been identified as hydrologically connected to the bedrock via the on-site process well. As a result, the bedrock aquifer is contaminated with PCE. Additionally, overburden groundwater is hydrologically connected to the sewer system and the PCE plume is entering the sewer near extraction well E-9 (see GZA Figure 2 in Attachment B). The overburden groundwater is also hydrologically connected to the canal near the facility building. Refer to the Site Investigation and Interim Measures section for additional information.

A municipal sewer line is buried west of the canal and traverses a north-south route on the Ball and

Socket site. The sewer line is located within a 4 foot wide trench in the bedrock and located approximately 8.5 to 11 feet bgs. Based on the Town of Cheshire Engineering Department Municipal Sewer drawings, bedrock is located approximately 4 to 10 feet bgs between passive soil gas samples 470600 and 470587 (see Gore Tetrachloroethylene Figure in Attachment A). Based on the passive soil gas data collected during the TtNUS sampling events, the sewer line acts as a preferential pathway.

Areas of Concern

On April 1, 1992, an CDM completed a RCRA Facility Assessment for the Ball and Socket site. Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) were identified in the assessment collectively as AOCs. The 13 identified AOCs included: the three unlined surface impoundments; a metal hydroxide sludge accumulation area in wastewater treatment building; a drum accumulation area in wastewater treatment building; a total of five separate drum satellite collection areas within the facility building; a former discharge pipe to the canal; a former lagoon; a solvent management area; floor drains; and surface water discharge pipes from the Facility property parking area to the canal.

The five drum satellite collection areas were used to temporarily store wastes prior to moving the drums to the drum accumulation area. The drum accumulation area was within a concrete bermed area with a metal liner. The 1992 Facility Assessment summarized the 13 AOCs into three known source areas based on historical analytical data: the three unlined surface impoundments; the former lagoon; and the solvent management area. These three source areas are described in greater detail below.

The three unlined surface impoundments had a capacity of 36,000 gallons each and were formerly used to dewater untreated wastewater from the Ball and Socket operations. The surface impoundments operated from 1970 to June 1984. The sludge and underlying soils were excavated from the surface impoundments in 1985. Analytical results of confirmatory soil samples indicated concentrations of PCE were below 10 ppb. On November 5, 1985, CTDEP submitted a "Clean closed" letter for the surface impoundments to Ball and Socket , and on June 18, 1986, EPA submitted a "Clean closed" letter for the surface impoundments to Ball and Socket.

The former lagoon has been estimated to be 0.75 acres and was used from 1958 to 1970. The former lagoon received wastewater from the Ball and Socket processes via an underground ceramic pipe. Wastewater would evaporate, or percolate into the groundwater, or overflow into the Willow Brook. In 1984, approximately 1,000 cubic yards of VOCs and metals contaminated soils were removed from the former lagoon. In 1994, the terminus of the ceramic pipe was identified by Ball and Socket and removed. The remainder of the ceramic pipe is still underground on site.

The solvent management area was located in the eastern section of the facility building. The historical degreasers (TCA, TCE, and PCE) were used in the solvent management area. In August 1992, GZA GeoEnvironmental, Inc. completed a report titled 'Solvent Management Area Study' for

the property owner that included a subsurface investigation and pilot test of an extraction system. The subsurface investigation included a soil gas survey, sub-slab soil sampling in the solvent management area, soil boring and monitoring well installations, hydrophysical logging of the Facility's process well, groundwater probe installations, and extraction well installations for a treatment system. Groundwater samples were analyzed for volatile organic compounds (VOCs) only. GZA delineated the PCE groundwater plume and identified that concentrations ranged up to 130,000 ppb. In addition to PCE, five other VOCs were detected including TCE; 1,2-DCE; 1,1-DCE; vinyl chloride (VC); and 1,1,1-TCA. Two groundwater anomalies were noted by GZA in the overburden: the process well effected the overburden groundwater flow direction when it was pumped; and, the groundwater near extraction well E-9 was entering the sanitary sewer system. GZA concluded that 23 feet below ground surface (bgs) there is a suspected inflow in the process well casing from overburden groundwater that provides 23% of the total process well water production. Laboratory analyses of aqueous samples collected from the sewer in the vicinity of E-9 detected PCE (1,000 ppb). GZA recommended operating the groundwater treatment extraction system at a rate of 1,400 to 3,600 gallons per day to provide containment of the PCE plume and the discharge of the PCE plume into the sewer near E-9.

Site Investigations and Interim Measures

Numerous phases of investigation and remedial actions have been conducted at the site. Some of the major activities and reports are summarized below.

On August 21, 1967, Ball and Socket received Order No. 303 from the CTDEP Water Resources Commission to abate pollution of the waters of Connecticut. As a result of the Order, Ball and Socket contracted an engineering firm to design an IWTP. The IWTP was designed for a flow of 30,000 gallons per day and included a cyanide oxidation tank, chlorination tank, and three unlined surface impoundments. In December 1970, construction of the IWTP was completed and wastewater discharge to the Lagoon property ceased. The surface impoundments were located south of the former boiler house building and were annually dredged to remove the sludge that was dewatered by evaporation and infiltration to the ground. Discharge into the three surface impoundments was conducted under NPDES Permit No. 0020877. Between 1979 and 1983, approximately 195,000 gallons of sludge was removed from the three surface impoundments and was disposed of off site.

In January 1984, Ball and Socket installed a groundwater monitoring system approved by CTDEP and EPA to monitor groundwater in the vicinity of the surface impoundments. Quarterly groundwater monitoring has been conducted on the Facility property since January 1984. The original RCRA quarterly monitoring analyses included: RCRA metals, chloride, cyanide, fluoride, iron, nitrate, pH, specific conductance, sulfate, and VOCs. Monitoring parameters have been adjusted over time. Based on the annual groundwater report by Triton Environmental, Inc. dated January 2003, groundwater was analyzed for halogenated VOCs, six dissolved metals (iron, lead, chromium, copper, nickel, and zinc), and total cyanide. In April 1998, CTDEP approved a reduction in the frequency of the monitoring to semi-annual. Historical groundwater monitoring has documented concentrations of PCE, TCE, cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-DCE, and vinyl

chloride above EPA maximum concentration limits (MCLs) and CTDEP Groundwater Protection Criteria.

On April 1, 1992, an EPA contractor completed a Final Draft RCRA Facility Assessment for the Facility property. The report concluded that the Facility property operations had documented contamination of soil, groundwater, and surface water. The sources of this contamination were identified as the solvent management area, surface impoundments, and the former lagoon. Recommendations included additional investigation of the solvent management storage area, the former ceramic wastewater discharge pipe, and the surface impoundments 'clean closure' activities including the Part B Post Closure Permit Application filed in February 1991. Additionally, an EPA contractor recommended coordination between EPA RCRA and CERCLA personnel to address contamination on the Lagoon property. Additional investigation was also recommended for the floor drains, surface runoff discharge pipes, and prior practices at the drum storage area at the IWTP.

In August 1992, as discussed in the Areas of Concern section above, Ball and Socket completed a subsurface investigation on the Facility property. Based on this investigation, Ball and Socket identified that the sewer line acts as a groundwater sink at E-9 and a portion of the groundwater PCE plume is entering the sewer. Depth to groundwater ranged from 1 to 3 feet bgs across the Facility property.

In 1994, an EPA contractor completed a SI Prioritization (SIP) report for the Lagoon property. No media was sampled during the SIP. The SIP reported that approximately 2,500 cubic yards, which varies from a previous report, of metal and VOC contaminated soil was removed from the Lagoon property. The SIP identified that the Lagoon property was a source of PCE that had likely contaminated groundwater beneath the site.

In July 1994, Ball and Socket completed an Environmental Site Assessment (ESA) of the Lagoon property. Soil, groundwater, surface water, and sediment samples were collected during the ESA. The surface water and sediment samples were collected from the canal. Test pits were completed to identify the location of the ceramic discharge pipe. The location of the ceramic discharge pipe was identified and one section of the pipe was removed. Soil samples were collected from the end of the discharge pipe and one from within the pipe.

The aqueous samples collected durign the 1994 ESA, were analyzed for metals, VOCs, total and amenable cyanide, and phenols. The soil and sediment samples were analyzed for metals, TCLP RCRA metals, VOCs, PAHs, total and amenable cyanide, and TPH. PCE was detected in the groundwater samples ranging in concentration from 5 to 29 ppb. PCE was detected in an upstream surface water sample (15 ppb) collected at the northern end of the Lagoon property and the downstream sample (8 ppb)collected at the southern end of the Lagoon property. Laboratory analyses of the soil samples collected from the end of the ceramic discharge pipe detected TPH (5,800 ppm), nine PAHs, total and amenable cyanide (each at 15 ppm), PCE (55 ppb), arsenic (52.8 ppm), barium (539 ppm), chromium (138 ppm), copper (3,710 ppm), lead (195 ppm), nickel (450 ppm), and zinc (353 ppm) above the background sample. Laboratory analyses of sediment samples

detected chromium (44 ppm), copper (3,470 ppm), lead (280 ppm), nickel (479 ppm), and zinc (245 ppm).

During February 21-22, March 14-17, and March 30, 2005, Tetra Tech NUS, Inc. (TtNUS) team personnel collected 11 groundwater drinking water samples from private wells, three sediment samples from Willow Brook and the canal, 20 vapor diffusion samples from Willow Brook, and 51 passive soil gas samples from the site ,not including quality assurance/quality control (QA/QC) samples, as part of the Ball and Socket Site Inspection (SI) to document the presence and/or absence of chemical contamination. Groundwater drinking water and associated QA/QC samples were submitted to a preselected laboratory, for VOCs analysis only. Sediment and associated QA/QC samples were submitted to preselected laboratories, for VOCs and metals analysis. The passive soil gas and associated QA/QC samples were submitted to a preselected laboratory, with chain of custody forms, for chlorinated solvent VOCs analysis. The passive vapor diffusion and associated QA/QC samples were submitted to the EPA Region I mobile laboratory, for TCE, PCE, and 1,1-DCE analysis. On March 30, 2005, during the TtNUS sampling event, EPA personnel collected three active soil gas samples and analyzed the samples for TCE, PCE, and 1,1-DCE in the EPA Region I mobile laboratory. Refer to Table 1 for a summary of sediment sample data and Table 2 for a summary of residential groundwater drinking water samples. Refer to Figure 1 for a site locus and Figure 2 for sample locations. Refer to Attachment A for a summary table of analytical data for passive vapor diffusion samples and active soil gas samples and three figures containing passive soil gas data for TCE, PCE, and 1,1-DCE.

Current Site Conditions

The Facility property is currently used for storage of dry goods and a pavement sealant manufactured by Dalton. Dalton maintains a pump and treat system that includes 11 extraction wells and the former production well. Based on conversations with a Dalton representative during the TtNUS sampling event, a new well located in the solvent management area, has been added to the treatment system. The treatment system consists of pumping the groundwater through activated carbon filters and discharging the water to the municipal sewer. Refer to GZA Figure 2 in Attachment B for extraction well locations.

Bi-annual groundwater monitoring for VOCs, dissolved metals, and cyanide analysis for the former surface impoundments is conducted. Based on the 2004 Annual Report, no apparent contaminant concentration trend in the past 5.5 years of data exists with the exception of an upward trend for tetrachloroethene concentrations. CTDEP has categorized groundwater under the site as GB/GA. GA groundwater classification is for existing or potential private drinking water sources. The GB groundwater classification is not suitable for drinking without treatment. The CTDEP has not established a GB Groundwater Protection Criteria. The GB/GA category identifies that the site groundwater is contaminated with a cleanup goal of GA. Refer to the Triton Environmental, Inc. Figure 2 depicting the monitoring wells sampled in Attachment B, a summary table of the 2004 data, and a summary table of data from 1999 to 2002.

The Lagoon property is currently a gravel parking area with a loading dock and some asphalt paved areas used by Dalton for storage of pavement sealant and transport loading area. No groundwater

monitoring is conducted for the former lagoon source. Only monitoring well MW-4R is located on the Lagoon property and is located north of the former lagoon location.

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			CTDEP GA Groundwater Protection Criteria exceeded for PCE, cis-1,2-DCE, TCE, and VC.
Air (indoors)[2]	X			CTDEP Groundwater Volatilization Criteria exceeded for VC.
Surface Soil (e.g.<2 ft)		X		Not suspected based on removal actions for lagoon and surface impoundments. Solvent management area paved or covered by buildings.
Surface Water	X			CTDEP Surface Water Protection Criteria for Groundwater exceeded for PCE.
Sediment	X			MADEP TEC Sediment Screening Guidelines exceeded for copper, mercury, nickel, and zinc.
Subsurf.Soil (e.g.>2 ft)	X			CTDEP Soil Mobility Criteria exceeded for PCE and TCE.
Air (outdoors)		X		Not suspected.

_____ 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.

__Y__ 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):

References used for this determination include the reports listed below:
Subsurface and Groundwater Quality Investigations, Ball and Socket Manufacturing Co., by Flaherty-Giavara Associates, Inc. (May 1984)
Groundwater Evaluation, Ball and Socket Manufacturing Company, by GCA Corporation (June 1985)
RCRA Facility Assessment, The Ball and Socket Manufacturing Company, Inc., by CDM Federal Programs Corporation (April 1, 1992)
Solvent Management Study Area, Ball and Socket Manufacturing Company, Inc., by GZA GeoEnvironmental, Inc. (August 1992)
Environmental Site Assessment, Former Willow Street Lagoon, by Environmental Risk Limited (July 1994)

Site Inspection Prioritization Report, Ball and Socket Lagoons, by CDM Federal Programs Corporation (July 5, 1994)
2002 Annual Groundwater Monitoring Report, Former Ball and Socket Manufacturing Company Facility, by Triton Environmental, Inc. (January 2003)
2004 Annual Groundwater Monitoring Report, Former Ball and Socket Manufacturing Company Facility, by Advanced Environmental Interface, Inc. (January 2005)

The appropriately protective risk-based "levels" (applicable promulgated standards) used in this EI are the Connecticut Department of Environmental Protection Remediation Standard Regulation (RSR). If concentrations detected in soil and groundwater at the site are less than the applicable RSR, then media are not considered to be contaminated. Based on the RSR, soil must meet the Residential Direct Exposure Standard unless an activity and use limitation is applied to the property. As mentioned earlier, CTDEP has classified the site groundwater as GB/GA, which is subject to cleanup to GA groundwater classification standards.

For this EI determination, the applicable soil categories are Residential Direct Exposure and GA Mobility Criteria, and applicable groundwater categories are GA Protection Criteria, Surface Water Protection Criteria for Substances in Groundwater, and Industrial/Commercial Volatilization Criteria. The CTDEP does not have a regulatory criteria for sediment. Therefore, this EI has presented, for sediment data comparison purposes, the MADEP Threshold Effect Concentration (TEC) Sediment Screening Guidelines. Data used for comparison to the above groundwater standards and guidelines are the 1984, 1992, 2000 through 2004 groundwater data, and the TtNUS SI residential groundwater drinking water sample data. Supplemental data includes the passive soil gas and passive vapor diffusion samples collected during the TtNUS SI.

Groundwater:

In 1992, PCE was detected in the groundwater on the site at concentrations ranging up to 130,000 ppb, which is above the GA Groundwater Protection Criteria (5 ppb). In 2004, the contaminants PCE, TCE, VC, and cis-1,2-DCE were detected above the GA Groundwater Protection Criteria. At least one of these contaminants was detected in seven of the nine monitoring wells sampled in 2004. The passive soil gas samples collected during the TtNUS SI detected concentrations of PCE, TCE, 1,1,1-TCA, cis-1,2-DCE, and trans-1,2-DCE along the municipal sewer line. Passive vapor diffusion samples placed in the sediment along Willow Brook for the TtNUS SI detected concentrations of PCE, TCE, and 1,1-DCE.

Indoor Air:

In 1992, PCE was detected in the groundwater on the site at concentrations ranging up to 130,000 ppb, which is above the Industrial/Commercial Volatilization Criteria (3,820 ppb).

Surface Water:

In 1992, PCE was detected in the groundwater on the site at concentrations ranging up to 130,000 ppb, which is above the Surface Water Protection Criteria (88 ppb). In 1994, PCE was detected in

two surface water samples collected at a concentrations of 8 and 15 ppb. In 2004, PCE was detected in two monitoring wells sampled in 2004 above the Surface Water Protection Criteria.

Sediment:

In 1994, sediment samples collected as part of the ESA detected concentrations of barium, lead, and cadmium. In 2005, copper, mercury, nickel, and zinc were detected in sediment samples collected for the TtNUS SI above the MADEP TEC Sediment Screening Guidelines. Passive vapor diffusion samples placed in the sediment of Willow Brook for the TtNUS SI detected concentrations of PCE, TCE, and 1,1-DCE.

Subsurface Soil

In 1990, PCE and TCE were detected in soil samples collected under the concrete slab in the solvent management area above the Soil GA Mobility Criteria.

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	NO	NO	YES			NO
Air (indoors)	NO	NO	NO	YES	NO	NO	NO
~~Soil (surface, e.g., <2 ft)~~	___	___	___	___	___	___	___
Surface Water	NO	NO			NO	NO	NO
Sediment	NO	NO			NO	NO	NO
Soil (subsurface e.g., >2 ft)	NO	NO	NO	YES	NO	NO	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).

__Y__ 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):

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

References used for this determination include the reports listed below:
Subsurface and Groundwater Quality Investigations, Ball and Socket Manufacturing Co., by Flaherty-Giavara Associates, Inc. (May 1984)
RCRA Facility Assessment, The Ball and Socket Manufacturing Company, Inc., by CDM Federal Programs Corporation (April 1, 1992)
Solvent Management Study Area, Ball and Socket Manufacturing Company, Inc., by GZA GeoEnvironmental, Inc. (August 1992)
Site Inspection Prioritization Report, Ball and Socket Lagoons, by CDM Federal Programs Corporation (July 5, 1994)
2002 Annual Groundwater Monitoring Report, Former Ball and Socket Manufacturing Company Facility, by Triton Environmental, Inc. (January 2003)
2004 Annual Groundwater Monitoring Report, Former Ball and Socket Manufacturing Company Facility, by Advanced Environmental Interface, Inc. (January 2005)

The site has restricted access with fencing and natural barriers, so residential exposures do not occur and trespasser are unlikely. Areas where contaminated soil exist are covered by buildings or paved areas.

Although groundwater concentrations indicate the possibility that residential indoor air is contaminated with vinyl chloride, the distance from the contaminated monitoring wells to a residential property is greater than 15 feet (CTDEP Residential Volatilization Criteria). It may be necessary to gather additional data to help determine whether indoor air is an actual threat to future workers in the solvent management area, and the actual threat to the nearest down gradient residential property on Railroad Avenue located approximately 150 feet west of the facility building.

Based on the TtNUS passive vapor diffusion sample data and the residential groundwater drinking water sample collected from 91 Willow Street (DW-GW-11), which had no detected concentrations above sample quantitation limits, the groundwater plume apparently does not extend beyond Willow Brook. The overburden groundwater plume appears to be captured by the extraction well system based on the TtNUS SI Grid A passive soil gas sample data. Based on the TtNUS residential well sampling data, the bedrock groundwater plume has not impacted the residential wells to contaminant concentrations greater then the CTDEP Groundwater Protection Criteria. The municipal sewer line appears to be a preferential pathway for groundwater contamination based on the TtNUS passive soil gas sample data. Additionally, the municipal sewer line appears to receive a portion of the groundwater plume based on the detection of VOCs in the passive soil gas samples collected in the vicinity of a sewer man hole west of the extraction wells system.

Currently, the only completed pathway is the potential for construction workers to be exposed to possibly contaminated subsurface soils and groundwater while performing excavation work in the solvent management area, and to possibly contaminated indoor air (PCE) based on groundwater concentrations. Work is limited to investigation and remediation activities by Dalton in the area of the former solvent management area where the PCE plume has concentrations above the CTDEP Industrial/Commercial Volatilization Criteria, so worker exposures are not expected to be significant.

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)?

__N__ 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):

References used for this determination include the reports listed below:
Subsurface and Groundwater Quality Investigations, Ball and Socket Manufacturing Co., by Flaherty-Giavara Associates, Inc. (May 1984)
Groundwater Evaluation, Ball and Socket Manufacturing Company, by GCA Corporation (June 1985)
RCRA Facility Assessment, The Ball and Socket Manufacturing Company, Inc., by CDM Federal Programs Corporation (April 1, 1992)
Solvent Management Study Area, Ball and Socket Manufacturing Company, Inc., by GZA GeoEnvironmental, Inc. (August 1992)
Environmental Site Assessment, Former Willow Street Lagoon, by Environmental Risk Limited (July 1994)
Site Inspection Prioritization Report, Ball and Socket Lagoons, by CDM Federal Programs Corporation (July 5, 1994)
Annual Groundwater Monitoring Report, Former Ball and Socket Manufacturing Company Facility, by Triton Environmental, Inc. (January 2003)

No current remedial actions are known to be planned at this time. However, the possible exposure of construction (remedial) workers to potentially contaminated indoor air is not reasonably expected to be significant. First, workers would not be expected to have a long term exposure to indoor air. Second, although a few monitoring wells contained concentrations of PCE above the CTDEP

Industrial/Commercial Volatilization Criteria (which are protective of worker exposures), construction workers would be expected to monitor ambient air and use engineering controls to reduce the risk of exposure and respirators.

Although no remedial actions are known to be planned, the possible exposure of construction (remedial) workers to potentially contaminated subsurface soils and groundwater is not reasonably expected to be significant for at least two reasons. First, construction workers will typically use engineering controls to reduce the risk of exposure and personal protective equipment. Second, the construction workers would not be expected to have long term exposures to any potentially contaminated soils and groundwater.

[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):

_YE_ 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 Ball and Socket Manufacturing Company (former), EPA ID # **CTD001167493**, located at 493 West Main Street in Cheshire, 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.

Dalton should undertake additional testing and control actions including: monitoring of residential groundwater drinking water wells, collect indoor air quality samples in the solvent management area, installation of a monitoring well within 15 feet of the nearest residential property on Railroad Avenue to the PCE plume, repair of the sewer in the vicinity of extraction well E-9, installation of monitoring wells on the Lagoon property to monitor the groundwater plume migrating along the sewer line and towards Willow Brook, and submittal of a yearly report on the groundwater treatment system.

Completed by (signature) _____ Date Aug 17, 05
(print) Edgar Davis
(title) Environmental Engineer (RCRA Corrective Action Region I)

Supervisor (signature) _____ Date 8/22/05
(print) Matthew Hoagland
(title) Section Chief RCRA Corrective Action (EPA Region I)
(EPA Region or State) EPA Region I

Locations where References may be found: The references can be found in the Ball and Socket Manufacturing Co. (former) file in the Records Center at 1 Congress Street.

Contact telephone and e-mail numbers

(name) Edgar Davis
(phone #) 617-918-1379
(e-mail Davis.Edgar@epamail.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.

TABLES

Table 1
Sediment Sample Analytical Results for
Ball and Socket Manufacturing Co. (former)
Exceeding MADEP Threshold Effect Concentrations for Freshwater Sediment
Samples Collected by TtNUS Team Personnel in March 2005

Sample Location	Substance	Sample Concentration (ppm)	MADEP TECs (ppm)
SD-01	**METALS**		
	Copper	59.0 J	31.6
	Lead	67.6	35.8
SD-02	**METALS**		
	Cadmium	1.5	0.99
	Copper	243 J	31.6
	Lead	109	35.8
	Mercury	0.32	0.18
	Nickel	33.6	22.7
	Zinc	153	121
SD-03	**METALS**		
	Cadmium	2.1	0.99
	Copper	138 J	31.6
	Lead	95.9	35.8
	Mercury	0.21	0.18
	Nickel	36.3	22.7
	Zinc	207	121
SD-DUP-01	**METALS**		
	Copper	194 J	31.6
	Lead	96.7	35.8
	Mercury	0.24	0.18
	Nickel	24.8	22.7

Notes:
ppm = Parts per million
MADEP = Massachusetts Department of Environmental Protection.
TEC = Threshold effect concentration are intended to identify contaminant concentrations below which harmful effects on sediment-dwelling benthic impact may begin, and where water column species and wildlife are at potential risk.
J = The associated numerical value is an estimated quantity.

Table 2
Summary of VOC Analytical Results
Residential Drinking Water Groundwater Samples
Collected for Ball and Socket Manufacturing Co.
by TtNUS Team Personnel in February 2005

Sample Location (Address)	Compound/Element	Sample Concentration		
GW-DW-01 (150 Oak Avenue)	Methyl tert-butyl ether	0.20	J	ppb
	1,1-Dichloroethane	0.10	J	ppb
	Trichloroethene	0.11	J	ppb
	Tetrachloroethene	0.12	J	ppb
GW-DW-02 (146 Oak Avenue)	1,1-Dichloroethane	0.11	J	ppb
	Trichloroethene	0.17	J	ppb
	Tetrachloroethene	0.37	J	ppb
GW-DW-03 (49 Hemlock Ridge Road)	Acetone	5.3	J	ppb
	Methyl tert-butyl ether	0.056	J	ppb
	Cyclohexane	0.18	J	ppb
	Ethylbenzene	0.084	J	ppb
	Xylenes	0.33	J	ppb
GW-DW-04 (54 Hemlock Ridge Road)	Methyl tert-butyl ether	0.12	J	ppb
GW-DW-05 (66 Hemlock Ridge Road)	Methyl tert-butyl ether	0.61		ppb
GW-DW-06 (26 Hemlock Ridge Road)	Methyl tert-butyl ether	0.16	J	ppb
GW-DW-07 (65 Hemlock Ridge Road)	Methyl tert-butyl ether	2.0		ppb
	Toluene	0.14	J	ppb
GW-DW-DUP-01 (184 Oak Avenue)	Methyl tert-butyl ether	0.16	J	ppb
GW-DW-10 (138 Oak Avenue)	Methyl tert-butyl ether	0.096	J	ppb
	Trichloroethene	0.28	J	ppb
	Tetrachloroethene	0.85		ppb

Notes:
J = Estimated value below contract required quantitation limit.
ppb = Parts per billion.

Ball & Socket Mfg. Cheshire, CT - Soil Gas and Passive Vapor Diffusion Sample Results (ppb/v)			
	3/30/2005		
Sample #	TCE	C_2Cl_4	1,1-DCEE
ASG-18 (Soil Gas)	ND(6)	172	ND(9)
ASG-42 (Soil Gas)	ND(6)	0.7	ND(9)
ASG-43 (Soil Gas)	ND(6)	3.6	ND(9)
Passive Vapor Diffusion Samples			
VS-18	47	263	23
VS-10	170	2970	388
VS-15	9	1080	ND(9)
VS-09	216	860	234
VS-TB-01	ND(1)	ND(0.6)	ND(9)
VS-12	110	1040	61
VS-08	15	4	37
VS-11 (1ml water in sample)	306	1256	712
VS-DUP-01 (1ml water in sample)	308	1242	750
VS-16 (2ml water in sample)	ND(6)	56	18
VS-19	ND(1)	ND(0.6)	ND(9)
VS-20	50	1070	14
VS-17 (4ml water in sample)	28	583	22
VS-14	40	1070	19
VS-13 (1ml water in sample)	86	2300	94
VS-07 (1ml water in sample)	ND(1)	ND(0.6)	ND(9)
VS-02 (5ml water in sample)	7	194	ND(9)
VS-05	ND(1)	ND(0.6)	ND(9)
VS-04 (5ml water in sample)	11	2	12
VS-03	ND(1)	ND(0.6)	ND(9)
VS-06 (4ml water in sample)	ND(1)	ND(0.6)	ND(9)
VS-01	ND(1)	ND(0.6)	ND(9)

Target Compounds and Approximate Reporting Limits

Ball & Socket Mfg. Cheshire, CT - Vapor Target Compounds & Approximate Reporting Limits	
Compound	**Reporting Limit (ppb/v)**
Trichloroethylene (TCE)	**5**
Tetrachloroethylene (C_2Cl_4)	**0.6**
1,1-Dichloroethylene (1,1-DCEE)	**9**

Results: The results in tables are Tentatively Identified Compounds and Approximate Concentrations

ND ( ) = Nothing detected above reporting limit. Reporting limit in parenthesis.

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 1
OFFICE OF ENVIRONMENTAL MEASUREMENT & EVALUATION
NORTH CHELMSFORD, MASSACHUSETTS 01863-2431

IEMORANDUM

ATE: April 5, 2005

UBJECT: **Ball & Socket Mfg. Cheshire, CT - Volatile Organics Analysis of Passive Vapor Diffusion and Soil Gas Samples**

ROM: Scott Clifford, Chemist

O: Gerardo Millan-Ramos, HBS

HRU: Dan Boudreau, Chemistry Laboratory Services Coordinator

PROJECT NUMBER: 05040003

DATE OF ANALYSIS: 03/30/05

ANALYTICAL PROCEDURE:

Vapor samples were analyzed using Region I's standard air screening method, Air Sample Analysis for Volatile Organic Compounds, (EIA-FLDGRAB4.WPD). Samples were analyzed on site using a Photovac 10A10 gas chromatograph equipped with a 4' 1/8 " SE-30 column and a photoionization detector , and a Shimadzu GC 14A gas chromatograph equipped with a 30 meter, 0.53mm DBPS-624 column, and electron capture detector. Concentrations of volatile organics were calculated using the external standard technique. Results are reported in parts per billion by volume (ppb/v).

Notes: Some passive vapor diffusion samples contained small amounts of water, however, they were analyzed in such a manner that the water did not affect the sample results.

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Table 4
Comparison of Ground Water Sample Analyte Concentrations to RSR Numerical Criteria and Drinking Water Standards
Former Ball & Socket Manufacturing Company Facility, Cheshire, Connecticut
June 2004

Analyte	Ground Water Protection Criteria for GA and GAA Areas (µg/L)	Surface Water Protection Criteria (µg/L)	Volatilization Criteria for Ground Water [1] (ppb)		Drinking Water Standards (µg/L)	Ground Water Sample Concentrations (ppb)				
			Residential	Industrial/ Commercial		B-1	B-2	B-4	B-5	MW-4R
USEPA Method 8021B Volatile Organic Compounds (VOCs)										
cis-1,2-Dichloroethene	70	NC	830	11,000	70[2]	9.9	ND<1.0	6.5	11	ND<1.0
1,1-Dichloroethene	7	96	190	920	7[2]	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Methylene Chloride (dichloromethane)	5	48,000	160	2,200	5[2]	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0
Tetrachloroethene	5	88	340	810	5[2]	13	ND<1.0	2.8	8.0	100
trans-1,2-Dichloroethene	100	NC	1,000	13,000	100[2]	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1-Trichloroethane	200	62,000	6,500	16,000	200[2]	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichloroethene	5	2,340	27	67	5[2]	ND<1.0	ND<1.0	2.1	3.5	1.4
Vinyl Chloride	2	15,750	1.6	52	2[2]	3.4	ND<1.6	ND<1.6	3.2	ND<1.6
Dissolved Metals										
Copper	1,300	48	NC	NC	1,000[3]	ND<40	ND<40	ND<40	ND<40	ND<40
Iron	NC	NC	NC	NC	300[3]	ND<100	ND<100	ND<100	ND<100	ND<100
Lead	15	13	NC	NC	15[4]	ND<13	ND<13	ND<13	ND<13	ND<13
Nickel	100	880	NC	NC	100[5]	ND<50	ND<50	ND<50	ND<50	ND<50
Zinc	5,000	123	NC	NC	5,000[3]	10	18	43	24	19
Total Cyanide	200	52	NC	NC	200[2,6]	ND<50	ND<50	ND<50	ND<50	ND<50

Notes:

ppb = Parts per billion.
µg/L = Micrograms per liter (comparable to ppb).
NC = No criterion established.
ND = Not detected above laboratory minimum detection limit.
NT = Not tested.
(1) = The criteria shown below are taken from DEP's proposed criteria dated March 2003, which DEP recommends for current use.
(2) = U. S. Environmental Protection Agency (EPA) primary drinking water maximum contaminant level (MCL), 40 CFR Section 141.61, July 1, 2003.
(3) = U. S. EPA secondary MCL, 40 CFR Section 143.3, July 1, 2003.
(4) = U. S. EPA action level, 40 CFR Section 141.80, July 1, 2003.
(5) = State of Connecticut Department of Public Health (DPH) MCL, July 13, 1998.
(6) = Criterion is for free cyanide.
☐ = Concentration exceeds associated criterion.

Table 4
Comparison of Ground Water Sample Analyte Concentrations to RSR Numerical Criteria and Drinking Water Standards
Former Ball & Socket Manufacturing Company Facility, Cheshire, Connecticut
June 2004

Analyte	Ground Water Protection Criteria for GA and GAA Areas (µg/L)	Surface Water Protection Criteria (µg/L)	Volatilization Criteria for Ground Water [1] (ppb)		Drinking Water Standards (µg/L)	Ground Water Sample Concentrations (ppb)					
			Residential	Industrial/ Commercial		GZ-1	GZ-1D	GZ-2	GZ-2D	Equipment Blank	Trip Blank
USEPA Method 8021B Volatile Organic Compounds (VOCs)											
cis-1,2-Dichloroethene	70	NC	830	11,000	70[2]	ND<1.0	440	3.3	14	ND<1.0	ND<1.0
1,1-Dichloroethene	7	96	190	920	7[2]	ND<1.0	1.5	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Methylene Chloride (dichloromethane)	5	48,000	160	2,200	5[2]	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0
Tetrachloroethene	5	88	340	810	5[2]	5.9	120	16	1.2	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	100	NC	1,000	13,000	100[2]	ND<1.0	3.7	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1-Trichloroethane	200	62,000	6,500	16,000	200[2]	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichloroethene	5	2,340	27	67	5[2]	ND<1.0	10	1.2	ND<1.0	ND<1.0	ND<1.0
Vinyl Chloride	2	15,750	1.6	52	2[2]	ND<1.6	ND<1.6	ND<1.6	5.8	ND<1.6	ND<1.6
Dissolved Metals											
Copper	1,300	48	NC	NC	1,000[3]	NT	NT	NT	NT	ND<40	NT
Iron	NC	NC	NC	NC	300[3]	NT	NT	NT	NT	ND<100	NT
Lead	15	13	NC	NC	15[4]	NT	NT	NT	NT	ND<15	NT
Nickel	100	880	NC	NC	100[5]	NT	NT	NT	NT	ND<50	NT
Zinc	5,000	123	NC	NC	5,000[3]	NT	NT	NT	NT	16	NT
Total Cyanide	200	52	NC	NC	200[2,6]	ND<50	ND<50	ND<50	ND<50	ND<50	NT

Notes:

ppb = Parts per billion.
µg/L = Micrograms per liter (comparable to ppb).
NC = No criterion established.
ND = Not detected above laboratory minimum detection limit.
NT = Not tested.
(1) = The criteria shown below are taken from DEP's proposed criteria dated March 2003, which DEP recommends for current use.
(2) = U. S. Environmental Protection Agency (EPA) primary drinking water maximum contaminant level (MCL), 40 CFR Section 141.61, July 1, 2003.
(3) = U. S. EPA secondary MCL, 40 CFR Section 143.3, July 1, 2003.
(4) = U. S. EPA action level, 40 CFR Section 141.80, July 1, 2003.
(5) = State of Connecticut Department of Public Health (DPH) MCL, July 13, 1998.
(6) = Criterion is for free cyanide.
☐ = Concentration exceeds associated criterion.

Table 5
Comparison of Ground Water Sample Analyte Concentrations to RSR Numerical Criteria and Drinking Water Standards
Former Ball & Socket Manufacturing Company Facility, Cheshire, Connecticut
December 2004

Analyte	Ground Water Protection Criteria for GA and GAA Areas (µg/L)	Surface Water Protection Criteria (µg/L)	Volatilization Criteria for Ground Water [1] (ppb)		Drinking Water Standards (µg/L)	Ground Water Sample Concentrations (ppb)					
			Residential	Industrial/ Commercial		B-1	B-2	B-4	B-5	MW-4R	GZ-1
Sample Collection Date						12/15/04	12/15/04	12/15/04	12/15/04	12/15/04	12/15/04
USEPA Method 8021B Volatile Organic Compounds (VOCs)											
cis-1,2-Dichloroethene	70	NC	830	11,000	70[2]	9.3	ND<1.0	8.6	9.9	ND<1.0	ND<1.0
Methylene Chloride (dichloromethane)	5	48,000	160	2,200	5[2]	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0
Tetrachloroethene	5	88	340	610	5[2]	4.4	ND<1.0	3.7	9.5	97	6.4
trans-1,2-Dichloroethene	100	NC	1,000	13,000	100[2]	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1-Trichloroethane	200	62,000	6,500	16,000	200[2]	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichloroethene	5	2,340	27	67	5[2]	ND<1.0	ND<1.0	2.0	2.5	1.7	ND<1.0
Vinyl Chloride	2	15,750	1.6	52	2[2]	7.5	ND<1.6	ND<1.6	2.9	ND<1.6	ND<1.6
Dissolved Metals											
Chromium (total)	50	NC	NC	NC	100[2]	ND<50	ND<50	ND<50	ND<50	ND<50	NT
Copper	1,300	48	NC	NC	1,000[3]	ND<40	ND<40	ND<40	ND<40	ND<40	NT
Iron	NC	NC	NC	NC	300[3]	ND<100	ND<100	ND<100	130	ND<100	NT
Lead	15	13	NC	NC	15[4]	ND<13	ND<13	ND<13	ND<13	ND<13	NT
Nickel	100	880	NC	NC	100[5]	ND<50	ND<50	ND<50	ND<50	ND<50	NT
Zinc	5,000	123	NC	NC	5,000[3]	15	78	32	23	ND<10	NT
Total Cyanide	200	52	NC	NC	200[2,6]	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50

Notes:

ppb = Parts per billion.
µg/L = Micrograms per liter (comparable to ppb).
NC = No criterion established.
ND = Not detected above laboratory minimum detection limit.
NT = Not tested.
(1) = The criteria shown below are taken from DEP's proposed criteria dated March 2003, which DEP recommends for current use.
(2) = U. S. Environmental Protection Agency (EPA) primary drinking water maximum contaminant level (MCL).
(3) = U. S. EPA secondary MCL.
(4) = U. S. EPA action level.
(5) = State of Connecticut Department of Public Health (DPH) MCL, July 13, 1998.
(6) = Criterion is for free cyanide.
☐ = Concentration exceeds associated criterion.

Table 5
Comparison of Ground Water Sample Analyte Concentrations to RSR Numerical Criteria and Drinking Water Standards
Former Ball & Socket Manufacturing Company Facility, Cheshire, Connecticut
December 2004

Analyte	Ground Water Protection Criteria for GA and GAA Areas (µg/L)	Surface Water Protection Criteria (µg/L)	Volatilization Criteria for Ground Water [1] (ppb)		Drinking Water Standards (µg/L)	Ground Water Sample Concentrations (ppb)				
			Residential	Industrial/ Commercial		GZ-1D	GZ-2	GZ-2D	Equipment Blank	Trip Blank
Sample Collection Date						12/15/04	12/15/04	12/15/04	12/15/04	12/15/04
USEPA Method 8021B Volatile Organic Compounds (VOCs)										
cis-1,2-Dichloroethene	70	NC	830	11,000	70[2]	46	2.1	7.4	ND<1.0	ND<1.0
Methylene Chloride (dichloromethane)	5	48,000	160	2,200	5[2]	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0
Tetrachloroethene	5	88	340	810	5[2]	190	15	1.4	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	100	NC	1,000	13,000	100[2]	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1-Trichloroethane	200	62,000	6,500	16,000	200[2]	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichloroethene	5	2,340	27	67	5[2]	4.1	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Vinyl Chloride	2	15,750	1.6	52	2[2]	2.9	ND<1.6	ND<1.6	ND<1.6	ND<1.6
Dissolved Metals										
Chromium (total)	50	NC	NC	NC	100[2]	NT	NT	NT	ND<50	NT
Copper	1,300	48	NC	NC	1,000[3]	NT	NT	NT	ND<40	NT
Iron	NC	NC	NC	NC	300[3]	NT	NT	NT	ND<100	NT
Lead	15	13	NC	NC	15[4]	NT	NT	NT	ND<13	NT
Nickel	100	880	NC	NC	100[5]	NT	NT	NT	ND<50	NT
Zinc	5,000	123	NC	NC	5,000[3]	NT	NT	NT	12	NT
Total Cyanide	200	52	NC	NC	200[2,6]	ND<50	ND<50	ND<50	ND<50	NT

Notes:

ppb = Parts per billion.
µg/L = Micrograms per liter (comparable to ppb).
NC = No criterion established.
ND = Not detected above laboratory minimum detection limit.
NT = Not tested.
(1) = The criteria shown below are taken from DEP's proposed criteria dated March 2003, which DEP recommends for current use.
(2) = U. S. Environmental Protection Agency (EPA) primary drinking water maximum contaminant level (MCL).
(3) = U. S. EPA secondary MCL.
(4) = U. S. EPA action level.
(5) = State of Connecticut Department of Public Health (DPH) MCL, July 13, 1998.
(6) = Criterion is for free cyanide.
☐ = Concentration exceeds associated criterion.

03/11/2005 15:26 FAX 8604244059 WEED 003

TABLE 5

Volatile Organic Compounds Summary (Halogenated Only) - Groundwater Samples

Former Ball & Socket Manufacturing Company - Cheshire, Connecticut

RCRA Groundwater Monitoring - 2000 Through 2002

Monitoring Well B-1

Compound	Units	Criteria					Analytical Results						
		GWPC	SWPC	VC Res.	VC I/C	MCL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Volatile Organic Compounds													
Vinyl Chloride	ug/L	2	15,750	2	2	2	ND	1.9	ND	[illegible]	[illegible]	ND	[illegible]
Methylene Chloride	ug/L	5	48,000	50,000	50,000	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ug/L	70	NE	NE	NE	70	3	7	6.8	7.5	7	8	15
Trichloroethene	ug/L	5	2,340	219	540	5	ND	1.2	ND	ND	ND	1.5	1.3
Tetrachloroethene	ug/L	5	88	1,500	3,820	5	[illegible]	[illegible]	[illegible]	4.8	[illegible]	3.9	3.9
Inorganic Compounds													
Copper	mg/L	1.3	0.048	NE	NE	1.000	ND	ND	ND	ND	ND	ND	ND
Nickel	mg/L	0.100	0.880	NE	NE	NE	ND	ND	ND	ND	ND	ND	ND
Zinc	mg/L	5	0.1230	NE	NE	5	0.03	ND	0.01	ND	ND	ND	ND
Iron	mg/L	NE	NE	NE	NE	0.30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	ND
Cyanide	mg/L	0.2	0.052	NE	NE	0.20	0.01	ND	0.01	ND	ND	ND	ND

Notes:

[1] = Remediation Standard Regulations (January 1996 and April 1999).

Bolded and Shaded Values Indicate an Exceedance of Applicable Remediation Standard Regulation Criteria.

ug/L = micrograms per liter.

mg/L = miligrams per liter.

SWPC = Surface Water Protection Criteria.

GWPC = Ground Water Protection Criteria

MCL = Maximun Consentration Limit.

VC = Volatilization Criteria.

I/C = Industrial/Commercial

Res. = Residential.

NE = Not Established by the CTDEP.

ND = Parameter Not Detected. Detection Limits vary, refer to attached lab results.

TABLE 5 (continued)

Volatile Organic Compounds Summary (Halogenated Only) - Groundwater Samples

Former Ball & Socket Manufacturing Company - Cheshire, Connecticut

RCRA Groundwater Monitoring - 1999 Through 2002

Monitoring Well B-2

Compound	Units	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Volatile Organic Compounds													
Vinyl Chloride	ug/L	2	15,750	2	2	2	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/L	5	48,000	50,000	50,000	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ug/L	70	NE	NE	NE	70	ND	ND	0.4	ND	ND	ND	ND
Trichloroethene	ug/L	5	2,340	219	540	5	ND	ND	ND	ND	ND	ND	ND
Tetrachloromethene	ug/L	5	88	1,500	3,820	5	ND	ND	0.4	ND	[illegible]	ND	ND
Inorganic Compounds													
Copper	mg/L	1.3	0.048	NE	NE	1.000	ND	ND	ND	ND	ND	ND	ND
Nickel	mg/L	0.100	0.880	NE	NE	NE	ND	ND	ND	ND	ND	ND	ND
Zinc	mg/L	5	0.1230	NE	NE	5	0.013	ND	0.054	ND	0.4	0.02	0.013
Iron	mg/L	NE	NE	NE	NE	0.30	[illegible]	[illegible]	0.868	[illegible]	ND	ND	ND
Cyanide	mg/L	0.2	0.052	NE	NE	0.20	ND	ND	ND	ND	ND	ND	ND

Notes:

[1]= Remediation Standard Regulations (January 1996 and April 1999).

Bolded and Shaded Values Indicate an Exceedance of Applicable Remediation Standard Regulation Criteria.

ug/L = micrograms per liter.

mg/L = miligrams per liter.

SWPC = Surface Water Protection Criteria.

GWPC = Ground Water Protection Criteria

MCL = Maximun Consentration Limit.

VC = Volatilization Criteria.

I/C = Industrial/Commercial

Res. = Residential.

NE = Not Established by the CTDEP.

ND = Parameter Not Detected. Detection Limits vary, refer to attached lab results.

TABLE 5 (continued)

Volatile Organic Compounds Summary (Halogenated Only) - Groundwater Samples

Former Ball & Socket Manufacturing Company - Cheshire, Connecticut

RCRA Groundwater Monitoring - 1999 Through 2002

Monitoring Well B-4

Compound	Units	CTDEP Criteria					Well B-4 Date of Sample Collection						
		SWPC	GWPC	VC/I/C	VC/Res.	MCL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Volatile Organic Compounds													
Vinyl Chloride	ug/L	2	15,750	2	2	2	[illegible]	ND	0.9	[illegible]	[illegible]	ND	[illegible]
Methylene Chloride	ug/L	5	48,000	50,000	50,000	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ug/L	70	NE	NE	NE	70	7.5	2.2	5.9	5.8	5.3	8.9	11
Trichloroethene	ug/L	5	2,340	219	540	5	3.7	1.1	1.8	1.6	2.6	3.1	3.1
Tetrachloroethene	ug/L	5	88	1,500	3,820	5	[illegible]	4.1	4.1	2.9	4.7	3.4	3.1
Inorganic Compounds													
Copper	mg/L	1.3	0.048	NE	NE	1.000	0.045	[illegible]	ND	ND	ND	ND	ND
Nickel	mg/L	0.100	0.880	NE	NE	NE	0.06	[illegible]	[illegible]	0.06	--	--	0.08
Zinc	mg/L	5	0.1230	NE	NE	5	0.071	[illegible]	0.026	0.031	0.05	0.07	0.10
Iron	mg/L	NE	NE	NE	NE	0.30	ND	0.056	0.186	ND	ND	ND	ND
Cyanide	mg/L	0.2	0.052	NE	NE	0.20	ND	0.01	ND	ND	ND	ND	ND

Notes:

[1]= Remediation Standard Regulations (January 1996 and April 1999).

Bolded and Shaded Values Indicate an Exceedance of Applicable Remediation Standard Regulation Criteria.

ug/L = micrograms per liter.

mg/L = milligrams per liter.

SWPC = Surface Water Protection Criteria.

GWPC = Ground Water Protection Criteria

MCL = Maximun Consentration Limit.

VC = Volatilization Criteria.

I/C = Industrial/Commercial

Res. = Residential.

NE = Not Established by the CTDEP.

ND = Parameter Not Detected. Detection Limits vary, refer to attached lab results.

TABLE 5 (continued)

Volatile Organic Compounds Summary (Halogenated Only) - Groundwater Samples

Former Ball & Socket Manufacturing Company - Cheshire, Connecticut

RCRA Groundwater Monitoring - 1999 Through 2002

Monitoring Well B-5

Compound	Units	State of Connecticut				CT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		GWPC[1]	SWPC	RVGRIC	I/C VC	MCL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Volatile Organic Compounds													
Vinyl Chloride	ug/L	2	15,750	2	2	2	[illegible]	ND	1.8	ND	[illegible]	ND	ND
Methylene Chloride	ug/L	5	48,000	50,000	50,000	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ug/L	70	NE	NE	NE	70	6.4	3	8.6	5.9	8.5	--	15
Trichloroethene	ug/L	5	2,340	219	540	5	3.2	1.2	2.2	3.7	1.5	3.0	3.2
Tetrachloroethene	ug/L	5	88	1,500	3,820	5	[illegible]	[illegible]	4.4	[illegible]	2.4	[illegible]	4.7
Inorganic Compounds													
Copper	mg/L	1.3	0.048	NE	NE	1.000	ND	ND	ND	ND	ND	ND	ND
Nickel	mg/L	0.100	0.880	NE	NE	NE	ND	ND	ND	ND	ND	ND	ND
Zinc	mg/L	5	0.1230	NE	NE	5	0.013	0.022	ND	ND	0.03	0.018	0.017
Iron	mg/L	NE	NE	NE	NE	0.30	[illegible]	[illegible]	[illegible]	0.24	ND	ND	ND
Cyanide	mg/L	0.2	0.052	NE	NE	0.20	ND	ND	ND	ND	ND	ND	ND

Notes:

[1] = Remediation Standard Regulations (January 1996 and April 1999).

Bolded and Shaded Values Indicate an Exceedance of Applicable Remediation Standard Regulation Criteria.

ug/L = micrograms per liter.

mg/L = miligrams per liter.

SWPC = Surface Water Protection Criteria.

GWPC = Ground Water Protection Criteria

MCL = Maximun Consentration Limit.

VC = Volatilization Criteria.

I/C = Industrial/Commercial

Res. = Residential.

NE = Not Established by the CTDEP.

ND = Parameter Not Detected. Detection Limits vary, refer to attached lab results.

TABLE 5 (continued)

Volatile Organic Compounds Summary (Halogenated Only) - Groundwater Samples

Former Ball & Socket Manufacturing Company - Cheshire, Connecticut

RCRA Groundwater Monitoring - 1999 Through 2002

Monitoring Well GZ-1

Compound	Units	Criteria					Volatile Organic Compounds						
		GWPC	I/C	Res.	VC	MCL	GZ-1						
		Volatile Organic Compounds											
Vinyl Chloride	ug/L	2	15,750	2	2	2	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/L	5	48,000	50,000	50,000	5	ND	ND	ND	[illegible]	ND	ND	ND
cis-1,2-Dichloroethene	ug/L	70	NE	NE	NE	70	ND	ND	1.8	ND	ND	ND	ND
Trichloroethene	ug/L	5	2,340	219	540	5	ND	ND	0.8	ND	ND	ND	ND
Tetrachloroethene	ug/L	5	88	1,500	3,820	5	[illegible]	4.9	[illegible]	3.8	3.7	[illegible]	[illegible]

Notes:

[1] = Remediation Standard Regulations (January 1996 and April 1999).

Bolded and Shaded Values Indicate an Exceedance of Applicable Remediation Standard Regulation Criteria.

ug/L = micrograms per liter (ug/L).

SWPC = Surface Water Protection Criteria.

GWPC = Ground Water Protection Criteria

MCL = Maximun Consentration Limit.

VC = Volatilization Criteria.

I/C = Industrial/Commercial

Res. = Residential.

NE = Not Established by the CTDEP.

ND = Parameter Not Detected. Detection Limits vary, refer to attached lab results.

TABLE 5 (continued)

Volatile Organic Compounds Summary (Halogenated Only) - Groundwater Samples

Former Ball & Socket Manufacturing Company - Cheshire, Connecticut

RCRA Groundwater Monitoring - 1999 Through 2002

Monitoring Well GZ-1D

Compound	Unit	Remediation Regulations				USEPA	Well GZ-1D - Date of Sample Collection						
		GWPC	SWPC	VC(I/C)	VC(Res)	MCL	12/7/99	6/5/00	12/6/00	6/5/01	12/6/01	6/4/02	12/5/02
Vinyl Chloride	ug/L	2	15,750	2	2	2	ND	ND	**[illegible]**	ND	**[illegible]**	ND	**[illegible]**
Methylene Chloride	ug/L	5	48,000	50,000	50,000	5	ND	ND	ND	**[illegible]**	ND	ND	ND
cis-1,2-Dichloroethene	ug/L	70	NE	NE	NE	70	20	**[illegible]**	**[illegible]**	**60**	**[illegible]**	**[illegible]**	**[illegible]**
Trichloroethene	ug/L	5	2,340	219	540	5	ND	**[illegible]**	**[illegible]**	ND	**[illegible]**	**[illegible]**	**[illegible]**
Tetrachloroethene	ug/L	5	88	1,500	3,820	5	ND	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**	**[illegible]**

Notes:

[1] = Remediation Standard Regulations (January 1996 and April 1999).

Bolded and Shaded Values Indicate an Exceedance of Applicable Remediation Standard Regulation Criteria.

ug/L = micrograms per liter.

SWPC = Surface Water Protection Criteria.

GWPC = Ground Water Protection Criteria

MCL = Maximun Consentration Limit.

VC = Volatilization Criteria.

I/C = Industrial/Commercial

Res. = Residential.

NE = Not Established by the CTDEP.

ND = Parameter Not Detected. Detection Limits vary, refer to attached lab results.

TABLE 5 (continued)

Volatile Organic Compounds Summary (Halogenated Only) - Groundwater Samples

Former Ball & Socket Manufacturing Company - Cheshire, Connecticut

RCRA Groundwater Monitoring - 1999 Through 2002

Monitoring Well GZ-2

Compound	Units	Criteria[1]				MCL	Volatile Organic Compounds						
							GZ-2						
		GWPC	SWPC	VC/R	VC/I/C		2/2/99	8/2/00	6/7/01	8/7/01	12/6/01	3/7/02	8/7/02
Vinyl Chloride	ug/L	2	15,750	2	2	2	ND	ND	0.9	ND	ND	ND	ND
Methylene Chloride	ug/L	5	48,000	50,000	50,000	5	ND	ND	ND	[illegible]	ND	ND	ND
cis-1,2-Dichloroethene	ug/L	70	NE	NE	NE	70	1.6	2.8	3.1	1.3	1.5	1.3	ND
Trichloroethene	ug/L	5	2,340	219	540	5	1.4	0.7	0.8	ND	ND	ND	ND
Tetrachloroethene	ug/L	5	88	1,500	3,820	5	[illegible]	[illegible]	3.2	[illegible]	2.2	[illegible]	[illegible]

Notes:

[1]= Remediation Standard Regulations (January 1996 and April 1999).

Bolded and Shaded Values Indicate an Exceedance of Applicable Remediation Standard Regulation Criteria.

ug/L = micrograms per liter.

SWPC = Surface Water Protection Criteria.

GWPC = Ground Water Protection Criteria

MCL = Maximun Consentration Limit.

VC = Volatilization Criteria.

I/C= Industrial/Commercial

Res. = Residential.

NE = Not Established by the CTDEP.

ND = Parameter Not Detected. Detection Limits vary, refer to attached lab results.

TABLE 5 (continued)

Volatile Organic Compounds Summary (Halogenated Only) - Groundwater Samples

Former Ball & Socket Manufacturing Company - Cheshire, Connecticut

RCRA Groundwater Monitoring - 1999 Through 2002

Monitoring Well GZ-2D

Compound	Units	Criteria[1]					Results	Results	Results	Results	Results	Results	Results
		GWPC	SWPC	VC Res	VC I/C	MCL	GZ-2D	GZ-2D	GZ-2D	GZ-2D	GZ-2D	GZ-2D	GZ-2D
Vinyl Chloride	ug/L	2	15,750	2	2	2	0.42	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Methylene Chloride	ug/L	5	48,000	50,000	50,000	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ug/L	70	NE	NE	NE	70	1.3	10	5.6	15	5.1	11	ND
Trichloroethene	ug/L	5	2,340	219	540	5	0.58	1	0.4	ND	ND	ND	ND
Tetrachloroethene	ug/L	5	88	1,500	3,820	5	3.2	2.2	0.5	1.1	ND	1.2	1.2

Notes:

[1]= Remediation Standard Regulations (January 1996 and April 1999).

Bolded and Shaded Values Indicate an Exceedance of Applicable Remediation Standard Regulation Criteria.

ug/L = micrograms per liter.

SWPC = Surface Water Protection Criteria.

GWPC = Ground Water Protection Criteria

MCL = Maximun Consentration Limit.

VC = Volatilization Criteria.

I/C = Industrial/Commercial

Res. = Residential.

NE = Not Established by the CTDEP.

ND = Parameter Not Detected. Detection Limits vary, refer to attached lab results.

TABLE 5 (continued)

Volatile Organic Compounds Summary (Halogenated Only) - Groundwater Samples

Former Ball & Socket Manufacturing Company - Cheshire, Connecticut

RCRA Groundwater Monitoring - 1999 Through 2002

Monitoring Well MW-4

Compound	Unit	Criteria				[illegible]	Well Sampling Information						
		SWPC	GWPC	I/C GR	VC I/C	MCL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Volatile Halogenated Compounds													
Vinyl Chloride	ug/L	2	15,750	2	2	2	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ug/L	5	48,000	50,000	50,000	5	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ug/L	70	NE	NE	NE	70	ND	ND	ND	ND	ND	1.2	ND
Trichloroethene	ug/L	5	2,340	219	540	5	ND	ND	ND	ND	ND	1.5	2.7
Tetrachloroethene	ug/L	5	88	1,500	3,820	5	1.6	1.3	0.4	[illegible]	[illegible]	[illegible]	[illegible]
Inorganic Compounds													
Lead	mg/L	0.015	0.013	NE	NE	0.05	ND	ND	0.0060	ND	ND	ND	ND
Copper	mg/L	1.3	0.048	NE	NE	1.000	ND	ND	ND	ND	ND	ND	ND
Nickel	mg/L	0.100	0.880	NE	NE	NE	ND	ND	0.012	[illegible]	ND	ND	ND
Zinc	mg/L	5	0.1230	NE	NE	5	0.0140	0.0137	0.0242	0.059	ND	ND	0.049
Iron	mg/L	NE	NE	NE	NE	0.30	0.05	ND	0.04	ND	0.11	ND	4.60
Cyanide	mg/L	0.2	0.052	NE	NE	0.20	ND	0.01	ND	ND	ND	ND	ND

Notes:

MW-4R installed on July 5, 2002 by Columbia Environmental Drilling.

[1] = Remediation Standard Regulations (January 1996 and April 1999).

Bolded and Shaded Values Indicate an Exceedance of Applicable Remediation Standard Regulation Criteria.

ug/L = micrograms per liter.

mg/L = miligrams per liter.

SWPC = Surface Water Protection Criteria.

GWPC = Ground Water Protection Criteria

MCL = Maximun Consentration Limit.

VC = Volatilization Criteria.

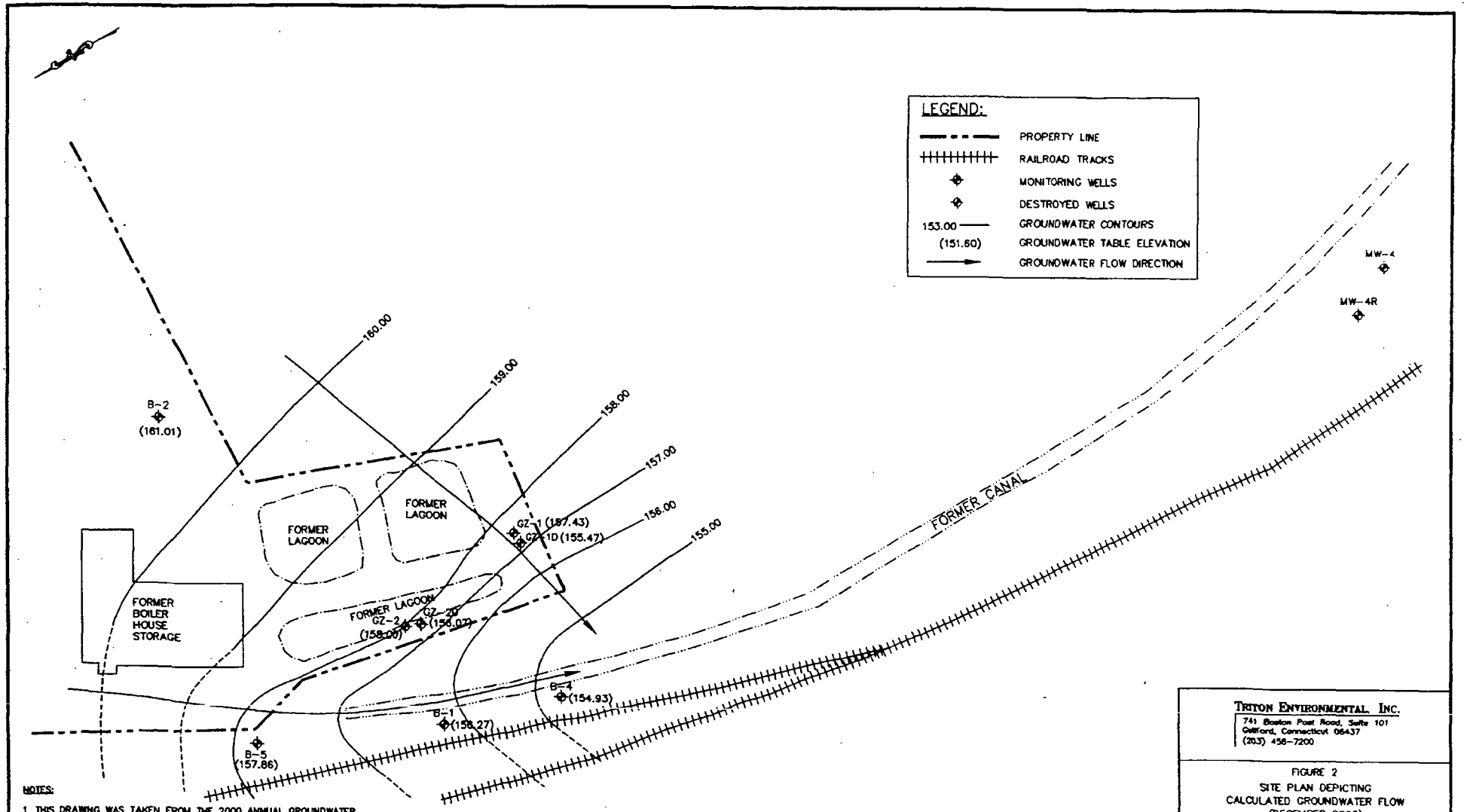
I/C = Industrial/Commercial

Res. = Residential.

NE = Not Established by the CTDEP.

ND = Parameter Not Detected. Detection Limits vary, refer to attached lab results.

FIGURES



NOTES:

1. THIS DRAWING WAS TAKEN FROM THE 2000 ANNUAL GROUNDWATER MONITORING REPORT, PREPARED BY GZA GEOENVIRONMENTAL, INC.

2. THE LOCATION OF ALL STRUCTURES, EQUIPMENT, DELINEATIONS AND OTHER FEATURES PRESENTED ON THIS DRAWING SHOULD BE CONSIDERED APPROXIMATE. THIS DRAWING SHOULD ONLY BE USED FOR GENERAL PRESENTATION PURPOSES AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. TRITON MAKES NO WARRANTY AS TO THE CORRECTNESS OR THE COMPLETENESS OF THE INFORMATION CONTAINED IN THIS DRAWING, AND THE USER ASSUMES ALL RISK OF LOSS TO PERSONS AND PROPERTY FROM RELIANCE THEREON.

APPROXIMATE SCALE

40 0 20 40 80

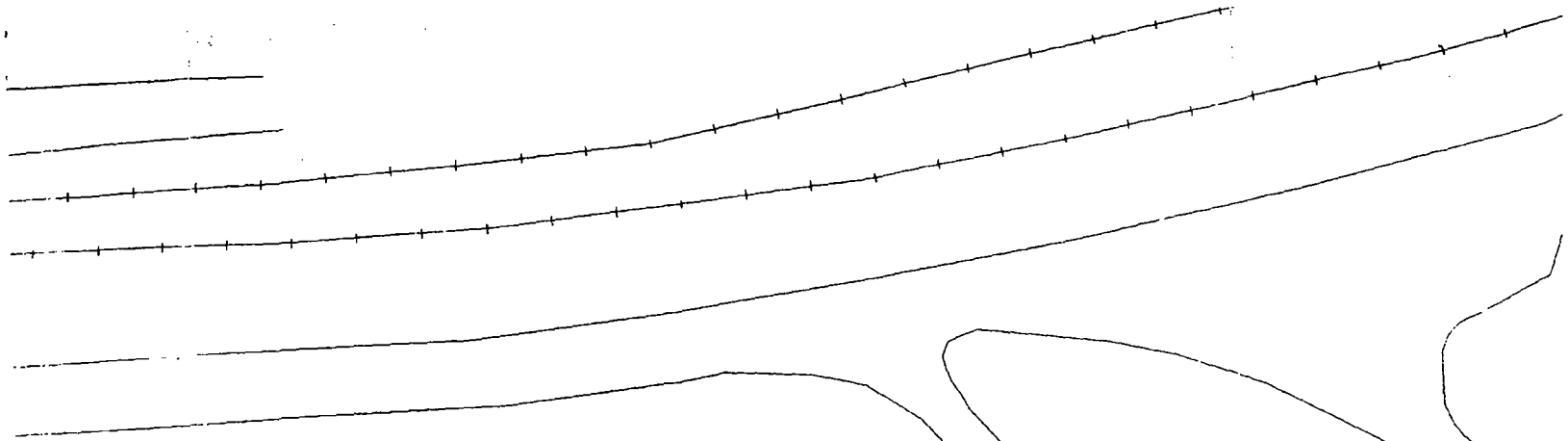
(IN FEET)
1 inch = 40 ft.

TRITON ENVIRONMENTAL, INC.
741 Boston Post Road, Suite 101
Guilford, Connecticut 06437
(203) 458-7200

FIGURE 2
SITE PLAN DEPICTING
CALCULATED GROUNDWATER FLOW
(DECEMBER 2002)

ANNUAL GROUNDWATER MONITORING REPORT
FORMER BALL & SOCKET MFG. CO.
492 WEST MAIN STREET
CHESHIRE, CONNECTICUT

DRAWN BY: W.H.M.	APPROVED BY: D.H.	
DATE: 1/3/03	SCALE: 1" = 40'	FILE No.: 100616C-1



ATES DIRECTION FLOW

R LINE

OLE

ERTY LINE

ERTY LINE/FENCE

NG GATE

XIMATE EDGE OF CANAL

OR WALL

GROUND FUEL OIL TANK (APPROXIMATE ON)

R DEGREASER LOCATION AND IDENTIFICATION XIMATE LOCATION)

DEGREASER

APPROXIMATE LOCATION)

TION WELL

SG-1 — SAMPLE LOCATION AND IDENTIFICATION

BS-5 — MONITORING WELL (BY FLAHERTY-GIAVERA ASSOCIATES)

GP-1 — GROUNDWATER PROBE (BY GZA)

WELL No. 2 — EXISTING MONITORING WELL

160.5' — INDICATES GROUNDWATER ELEVATION (IN FEET)

GZ-1 — MONITORING WELL (BY GZA DRILLING)

159.8' — INDICATES GROUNDWATER ELEVATION (IN FEET)

E-1 — WELL LOCATION AND IDENTIFICATION

159.3' — INDICATES GROUNDWATER ELEVATION (IN FEET)

REV. No.	DESCRIPTION
	E

SCALE IN 1"=30'

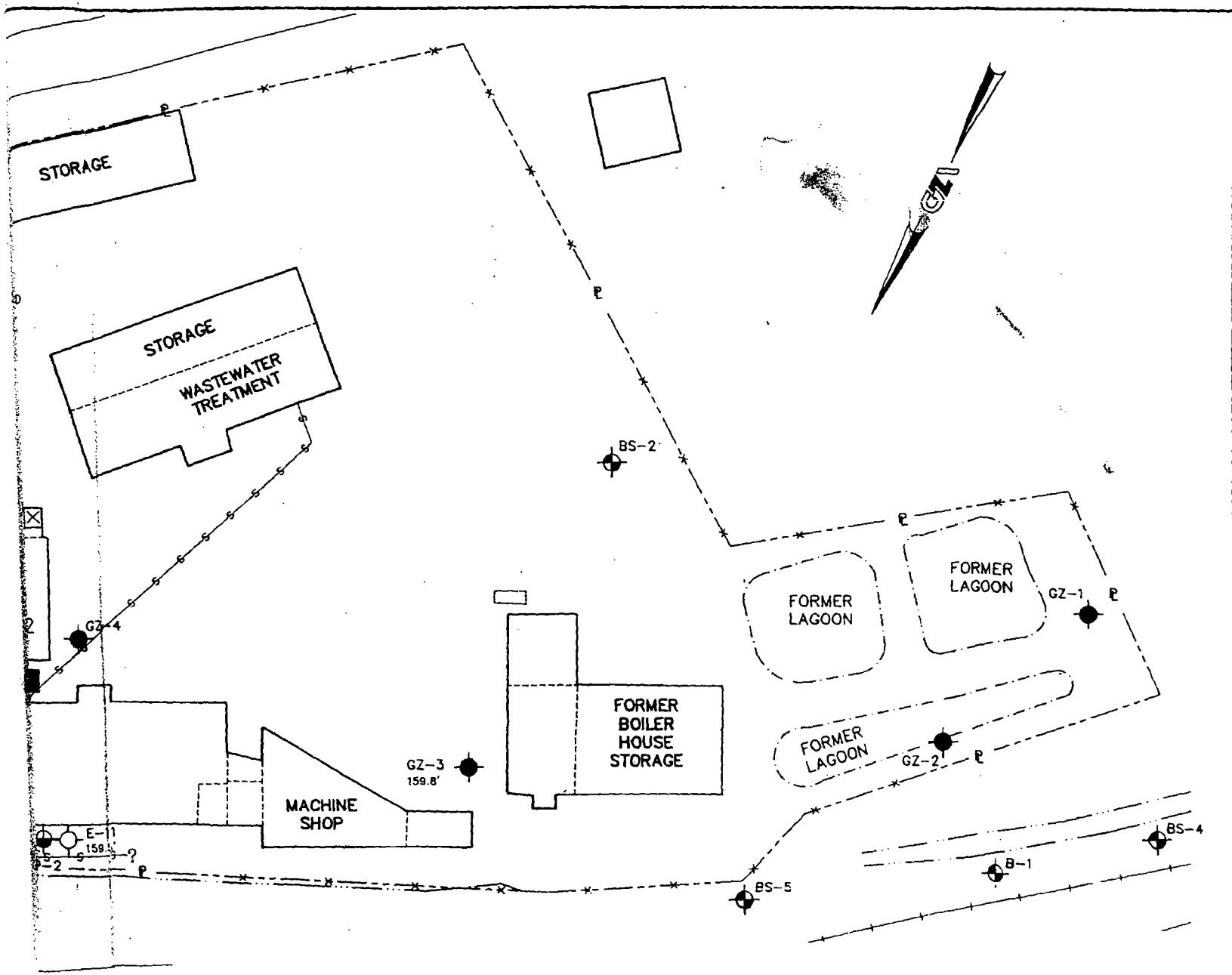
0' 15' 30' 60'

BALL AND SOCKET
CHESHIRE, CONNECTICUT

SITE PLAN

PROJECT No. 40587

FIGURE No. 2



DRAWN BY: RAW
SCALE: 1"=30'
DATE: JULY 29, 1992

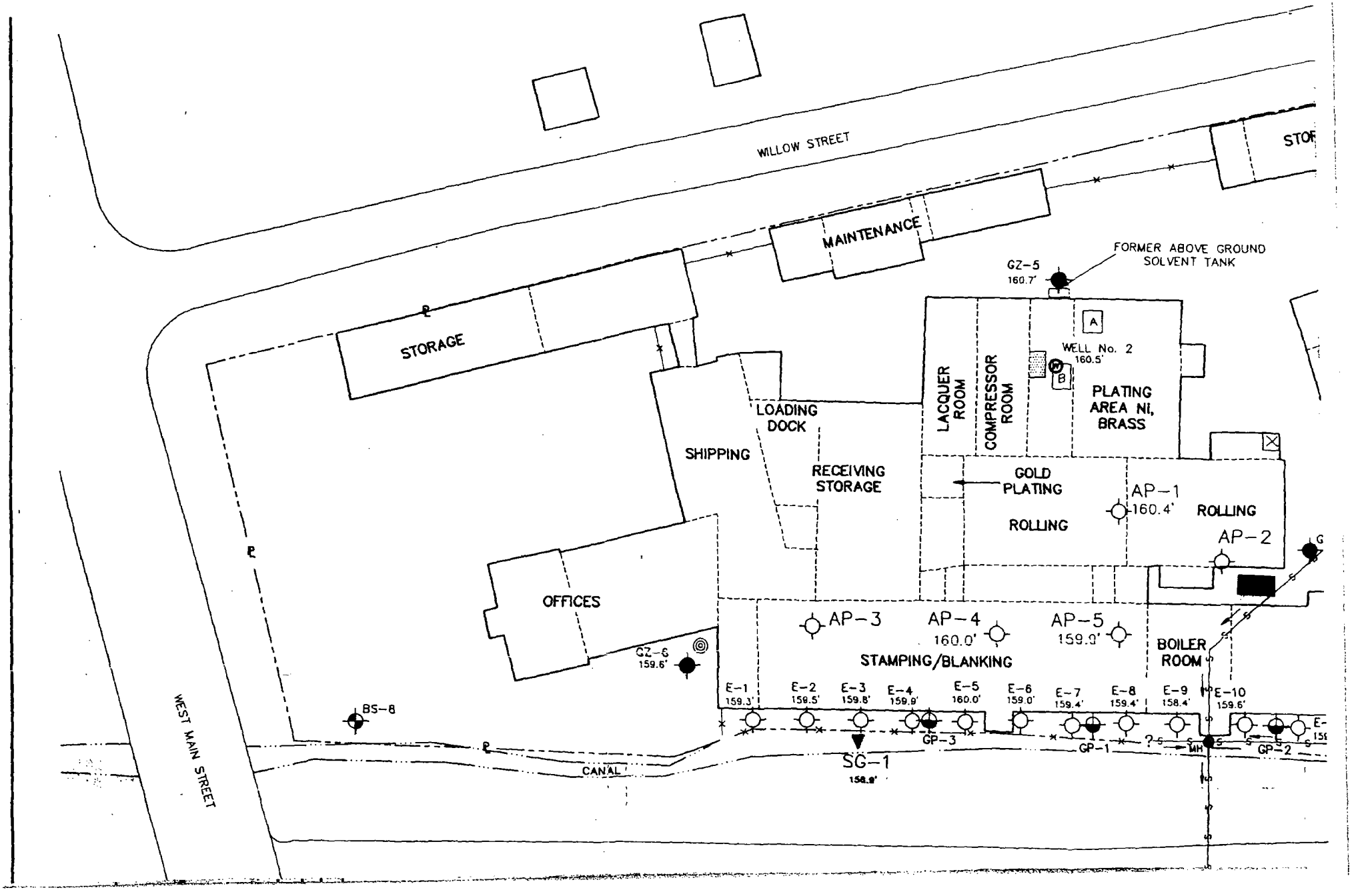
DESIGNED BY: EML
CHECKED BY: JTG
REVIEWED BY: TFS

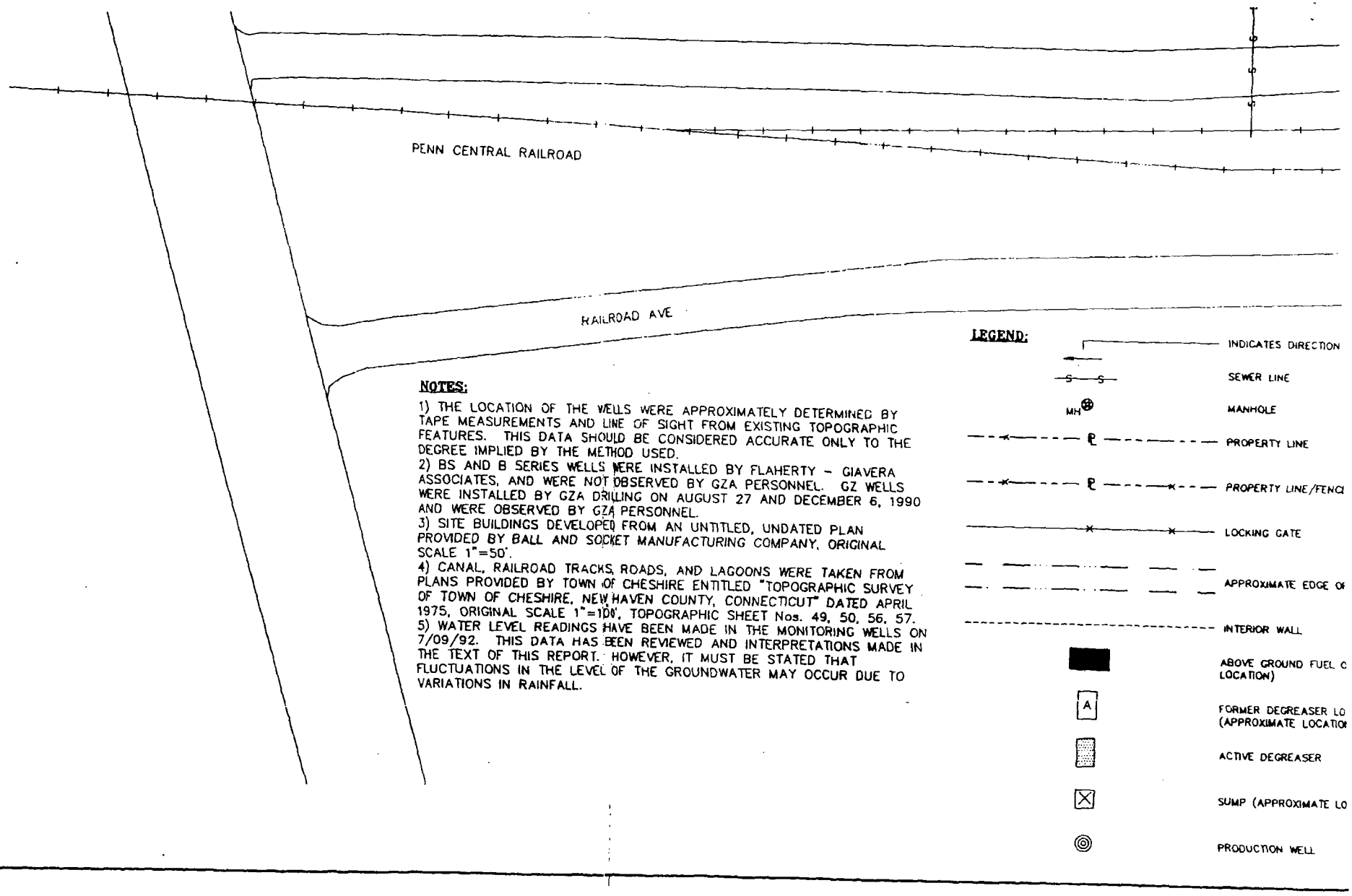
BY	DATE

GZA GeoEnvironmental, Inc.

0' 90' 120'

FEET


WILLOW STREET
MAINTENANCE
STORAGE
SHIPPING
LOADING DOCK
RECEIVING STORAGE
OFFICES
LACQUER ROOM
COMPRESSOR ROOM
WELL No. 2
160.5'
PLATING AREA Ni, BRASS
FORMER ABOVE GROUND SOLVENT TANK
GZ-5
160.7'
GOLD PLATING
ROLLING
AP-1
160.4'
ROLLING
AP-2
AP-3
AP-4
160.0'
AP-5
159.9'
STAMPING/BLANKING
BOILER ROOM
GZ-6
159.6'
BS-8
E-1
159.3'
E-2
159.5'
E-3
159.8'
E-4
159.9'
E-5
160.0'
E-6
159.0'
E-7
159.4'
E-8
159.4'
E-9
158.4'
E-10
159.6'
GP-3
GP-1
GP-2
MH
SG-1
158.9'
CANAL
WEST MAIN STREET



NOTES:

1) THE LOCATION OF THE WELLS WERE APPROXIMATELY DETERMINED BY TAPE MEASUREMENTS AND LINE OF SIGHT FROM EXISTING TOPOGRAPHIC FEATURES. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
2) BS AND B SERIES WELLS WERE INSTALLED BY FLAHERTY - GIAVERA ASSOCIATES, AND WERE NOT OBSERVED BY GZA PERSONNEL. GZ WELLS WERE INSTALLED BY GZA DRILLING ON AUGUST 27 AND DECEMBER 6, 1990 AND WERE OBSERVED BY GZA PERSONNEL.
3) SITE BUILDINGS DEVELOPED FROM AN UNTITLED, UNDATED PLAN PROVIDED BY BALL AND SOCKET MANUFACTURING COMPANY, ORIGINAL SCALE 1"=50'.
4) CANAL, RAILROAD TRACKS, ROADS, AND LAGOONS WERE TAKEN FROM PLANS PROVIDED BY TOWN OF CHESHIRE ENTITLED "TOPOGRAPHIC SURVEY OF TOWN OF CHESHIRE, NEW HAVEN COUNTY, CONNECTICUT" DATED APRIL 1975, ORIGINAL SCALE 1"=100', TOPOGRAPHIC SHEET Nos. 49, 50, 56, 57.
5) WATER LEVEL READINGS HAVE BEEN MADE IN THE MONITORING WELLS ON 7/09/92. THIS DATA HAS BEEN REVIEWED AND INTERPRETATIONS MADE IN THE TEXT OF THIS REPORT. HOWEVER, IT MUST BE STATED THAT FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO VARIATIONS IN RAINFALL.

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