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REMEDIAL DESIGN/REMEDIAL ACTION
WORK PLAN
BETTER BRITE PLATING, INC.
DE PERE, WISCONSIN

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APPENDIX

ACRONYMS

AETS	Advanced Environmental Technical Services
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
CFR	Code of Federal Regulations
CP	Contingency Plan
CQAP	Construction Quality Assurance Plan
EERB	Emergency Enforcement and Response Branch
FFS	Focused Feasibility Study
H&SP	Health and Safety Plan
NCP	National Contingency Plan
NPL	National Priority List
OU	Operable Unit
PALs	Preventive Action Limits
POTW	Publicly Owned Treatment Works
ppm	parts per million
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RA	Remedial Action
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SER	Site Evaluation Report
SOW	Statement of Work
SPCC	Spill Prevention, Control, and Countermeasures
TAT	Technical Assistance Team
U.S. EPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
WAC	Wisconsin Administrative Code
WDNR	Wisconsin Department of Natural Resources
WDOH	Wisconsin Department of Health

1.0 INTRODUCTION

1.1 Background

The National Priority List (NPL) site consists of two separate properties where Better Brite conducted operations. The properties are known as the Chrome and Zinc shops. The Better Brite Chrome and Zinc Shops are located at 519 Lande Street and 315 South Sixth Street, respectively, in the City of De Pere, Brown County, Wisconsin (Figure 1-1). The sites are located about 2,000 feet apart in Sections 21 and 28 in the De Pere Township (T23N, R20E). The Chrome Shop property comprises 3.7 acres and the Zinc Shop property comprises 0.61 acre. Both sites are situated approximately ¼ mile west of the Fox River, and are in primarily residential areas, although the Zinc Shop property is zoned for commercial/light industrial use. Ground water contaminated with chromium, other metals, and volatile organic compounds (VOCs) has been detected at both the sites. The Better Brite sites were nominated for inclusion on the NPL in October, 1989, and added to the list on August 28, 1990. The Zinc Shop and Chrome Shop were combined as one site for joint nomination to the NPL because of their proximity to one another and related background. Both plating shops are currently decommissioned and all building and manufacturing equipment have been removed from the sites. HSI GeoTrans was contracted by the Wisconsin Department of Natural Resources (WDNR) to prepare the Remedial Investigation (RI), Focused Feasibility Study (FFS), and Remedial Design (RD). This work is being completed to meet the requirements of the Record of Decision (ROD) for the ground-water operable unit (OU) and related Statement of Work (SOW) in conformance with the National Contingency Plan (NCP) requirements.

It is estimated that 46,000 people obtain drinking water from municipal wells within 3 miles of the Chrome Shop and Zinc Shop. This includes residents from De Pere as well as a portion of the Allouez and Green Bay communities. The Grant Street water supply well, De Pere municipal well #2, is located about 250 feet generally downgradient from the Zinc Shop (U.S. EPA, 1989a).

Both sites are located in a mixed residential/commercial area comprised chiefly of single-family homes. Several residential properties directly border the Zinc and Chrome Shops, with the nearest residence located less than 30 feet to the south of the Zinc Shop. Approximately seven single-family residences are adjacent to the Chrome Shop. Commercial operations near the shops include a foundry on South Sixth Street, and a dispatch facility for an overnight courier service adjacent to the Zinc Shop. A secondary school, a high school, and a small college (St. Norbert College) are located within 1 mile of the facilities. The high school is about 800 feet (less than 2 blocks) from the Zinc Shop (WDOH, 1991).

The geology at the Better Brite sites is comprised of approximately 30 feet of unconsolidated glacial deposits overlying bedrock. The unconsolidated deposits are primarily silty clay to lean clay with lenses and seams of silt, silty sand, sandy clay, and clayey sand. The bedrock consists of approximately 150 feet of dolomite of the Ordovician-age Sinnipee Group, underlain by sandstone of the Ordovician-age St. Peter Formation. These bedrock formations are underlain by Cambrian-age sandstones and Precambrian-age crystalline bedrock at a depth of approximately 600 to 2,000 feet. Each facility has a ground-water extraction sump, which was installed as part of the removal activities. The shallow ground water at both locations generally flows towards the extraction sumps.

1.1.1 Chrome Shop

1.1.1.1 Site Description

The former Better Brite Chrome Shop is located at 519 Lande Street within the City of De Pere, Brown County, Wisconsin and occupies approximately 3.7 acres (Figure 1-2). The site is bordered to the north by Lande Street, to the east by a railway, and to the south and west by residences. The Chrome Shop lies within a residential area; the nearest homes are about 100 feet from the former facility property boundary. The Chrome Shop is located approximately ¼ mile west of the Fox River, which flows northeast to Green Bay.

1.1.1.2 Site History

Better Brite began its chrome plating division in the mid 1970's at 519 Lande Street, De Pere, Wisconsin. The Chrome Shop primarily engaged in chrome plating 15 to 20 foot rollers for paper mills in the area. Vertical in-ground dip tanks were used to plate the paper rollers. Specific information on the facility operation is not documented.

A description of the site history was presented in the Site Evaluation Report (SER; HSI, 1992) and the RI report (HSI, 1995). Based on aerial photographs, a private residence, two large buildings (apparently an elevator and a storage building) and a smaller building (possibly a utility building) were present on the northern portion of the property in 1963. The southern half of the property was open field. In a September 1972 aerial photograph, the southern half of the property had been cleared, possibly in preparation for construction of the building which would house the Chrome Shop. The Site property was deeded to Better Brite in early 1973. A September 1973 aerial photo shows the production building for Better Brite is under construction.

By 1978 the chrome plating operations had begun at the site. The first reported spill documented in WDNR records, estimated at 2,200 gallons, occurred in February 1979 (WDNR, 1979). As a result of this spill, a subsurface loading dock on the northwest corner of the building was filled with 2 to 3 feet of frozen yellow water. The WDNR ordered the frozen rinse water be moved inside the facility to be thawed before discharging the melted water to the sanitary sewer. The company was also ordered to remove the contaminated soils located below the frozen water. WDNR records indicate contaminated soils were not removed, and fresh sandy soil was brought to the site and the loading dock filled in to grade without WDNR approval. Better Brite was subsequently ordered to install a ground-water collection and pretreatment system.

Initially, it was thought that most of the contamination at the site resulted from spillage above grade. Therefore, in August 1979, the WDNR ordered the installation of shallow ground-water monitor wells, a collection trench system, often referred to as the "French Drain" and a surface-water holding pond to intercept any contaminated ground and surface water resulting from these spills. This work was performed by Better Brite. In addition, contaminated soils from neighboring properties were removed and stockpiled on the Chrome Shop property.

Better Brite filed for bankruptcy in October 1985. Plating operations were also discontinued at the site at this time. During the bankruptcy proceedings, the WDNR discovered that the vertical tanks located under the building had been leaking. By 1985 it was estimated that between 20,000 and 60,000 gallons of chrome plating solution leaked from the tanks during the time the plant was in operation (WDNR, 1988b).

1.1.1.3 Corrective Measures

Several corrective measures have been implemented since 1979 to remove hazardous materials, contaminated soil, and ground water. The purpose of these removal activities was to reduce the threat of public exposure to contaminants. The following sections provide a summary of the corrective measures conducted at the Chrome Shop.

1.1.1.3.1 Removal Activities

In 1980, contaminated soil from a neighboring property west of the facility was excavated and deposited on the Chrome Shop property. The contaminated soil was disposed of in a licensed landfill as part of the United States Environmental Protection Agency (U.S. EPA) removal activities in 1986.

In April 1986, the U.S. EPA's Technical Assistance Team (TAT) removed four subsurface plating and cleaning tanks (as best possible due to damaged tank bottoms) from inside the building. Better Brite had previously attempted to remove the tanks and only removed portions of them. Three of the tanks contained approximately 1-1/2 feet of liquid material. Tank #1 had contained a degreaser. Waste plating solutions were stored in tanks #2 and #3. The fourth tank, which had stored muriatic acid (hydrochloric acid), contained about 14 feet of liquid (Weston-SPER, 1986).

The U.S. EPA Emergency Enforcement and Response Branch (EERB) then conducted the Phase I removal activities at the Chrome Shop from September 1986 until April 1987. Activities included the removal of all on-site hazardous materials contained in drums, tanks, and vats, the installation of a site "monitor well," the removal of visibly stained soils from the south and southwest sides of the building, and removal of wastes from the facility plating pits. The "monitor well" consisted of a 6-inch diameter pipe placed in the void created by removal of the vertical in-ground tanks. Visibly contaminated soils were excavated around the plating pits and all tanks, vats, and drums were removed and scrapped. In total, the U.S. EPA EERB removed approximately 83 tons of contaminated soil, 9,270 gallons of chromic acid, 3,600 gallons of base/neutral liquids, 550 gallons of cyanide solution, 150 pounds of cyanide sludge, and 500 gallons of flammable liquids (U.S. EPA, 1990).

In the summer of 1989, the Chrome Shop building and contents were sold by the owner of the building, Mr. John Zenner. The City of De Pere and WDNR stipulated to the buyer that the area beneath the building had to be capped and the surface water holding pond closed off by filling with soil. The Chrome Shop facility building was removed and the former building area was capped with clay by the WDNR and the buyer. The area was fenced by the WDNR to prevent public access to possible contaminated soils (U.S. EPA, 1990).

In 1993, the U.S. EPA TAT excavated impacted soil from the area located adjacent to the southwest corner of the former location of the Chrome Shop building (Phase II removal). The approximate limits of this excavation are depicted by the sump boundary on Figure 1-2. Soil was excavated to a depth of approximately 20 feet below ground surface (bgs). Soil samples collected from the bottom of the excavation confirmed that the soil left in place was not impacted with metals. Additional information on the excavation activities that took place in 1993 at the Chrome Shop are contained in the RI (HSI, 1995).

During Phase II removal activities, the portion of the concrete foundation of the Chrome Shop that remained in place after previous excavation activities was removed and taken off-site for proper disposal. Impacted sand fill beneath the foundation was also excavated and taken off-site for proper disposal.

The U.S. EPA TAT also removed impacted surface soil from around the Chrome Shop and on properties adjacent to the site. Surface soil was excavated to depths of approximately 1.0 to 1.5 feet bgs. Analytical data for surface (0 to 0.5 feet bgs) and subsurface (2.5 to 3.0 feet bgs) soil samples collected from across the Chrome Shop and adjacent properties were used to define the extent of surface soil impacts and direct the excavation activities. At the completion of excavation activities, clean soil was placed over the area from which the impacted surface soil was removed.

A total of approximately 4,236 tons of chromium contaminated soil, concrete, and debris classified as characteristic D007 hazardous waste were removed from the Chrome Shop during the Phase II removal activities. In addition, approximately 6,103 tons of chromium contaminated special waste soil, concrete, and debris were removed from the Chrome Shop.

1.1.1.3.2 Water Treatment

In 1979 and 1980, Better Brite installed ten shallow ground-water monitor wells, a ground-water collection system, and a surface water control system. The ground-water collection system consisted of a collection trench on the southern and western edge of the southwestern corner of the property (ground-water flow was determined to be to the west), and a 500-gallon sump for temporary storage of the contaminated ground water. The surface water control system consisted of a retention berm on the southern and western sides of the trench alignment that directed water to a surface water holding pond located in the northwest corner of the Chrome Shop property. Surface water could be pumped from the surface water holding pond to the sanitary or storm sewer depending on the concentration of chromium in the water.

The collection trench installed by Better Brite along the southern and western edges of their property had not been pumped since approximately 1986. Ground-water levels had risen during the spring thaw event in 1988, which caused flooding in the low areas between the residences and the Chrome Shop. Chromium-contaminated surface water was collecting in the adjacent neighbors' backyards, causing chromium to deposit in soils and gardens on their properties. Therefore, in March 1988, the U.S. EPA EERB authorized pumping of the water from the previously installed collection trench system into the City of De Pere sanitary sewer as an interim measure to eliminate ponding (U.S. EPA, 1990).

In an effort to eliminate the threat of ground-water contamination and continued off-site movement of contaminants at the Chrome Shop, the U.S. EPA EERB installed an on-site water pretreatment system in September, 1990. The system included a recovery well, a 5,500-gallon holding tank, a 5,000-gallon reaction vessel (tank) and a protective building to house the equipment. The recovery well was the "monitor well" installed within the void created by the removal of the vertical in-ground tanks in 1986.

Ground water was pumped via the recovery well and collection trench (French Drain) to the holding tank for temporary storage. Ground water is then transferred to the reaction tank in batches where the pH is initially lowered to approximately 2.5 by adding sulfuric acid. Reduction of hexavalent chrome to trivalent chrome is facilitated by adding sodium bisulfite ($NaHSO_3$), which is followed by addition of sodium hydroxide to raise pH to approximately 8.5 and precipitate chromium hydroxide. A polymer is added at this point in the treatment process to settle the precipitate. The treated water is decanted off and discharged to the sanitary sewer. The precipitate is sent through a filter press. The dewatered sludge is placed in drums and has been determined by laboratory analysis to be hazardous waste.

The system was designed in cooperation with the City of De Pere and is capable of pre-treating approximately 2,000 gallons of chromium-contaminated water per day for discharge into the De Pere sanitary sewer. Contaminants (chromium hydroxide sludge predominantly) removed from the water were initially transported to the Zinc Shop building for temporary storage and then to a metal recovery facility (U.S. EPA, 1990 and Weston, 1990). Currently, Advanced Environmental Technical Services (AETS) is contracted by WDNR to transport the sludge to its Menomonee Falls, Wisconsin facility for appropriate disposal.

After completing the Phase II removal activities, the U.S. EPA TAT replaced the existing recovery well and french drain with a ground-water collection system in 1993. The ground-water collection system was constructed in the pit created by the excavation of impacted soil located adjacent to the southwest corner of the former location of the Chrome Shop building.

An impermeable membrane was placed on the bottom of the pit and 6-inch diameter perforated pipe was then installed on top of the impermeable membrane. Pea gravel was placed around the perforated pipe and a filter fabric was then placed on top of the pea gravel. The excavation was then filled with 3/4-inch diameter washed limestone gravel to approximately 6 feet bgs. Filter fabric was then placed on top of the limestone gravel and a clean clay cap was placed above the filter fabric to ground level. The perforated pipe was connected to a large diameter perforated standpipe (sump) from which the ground water that collects in the collection system can be extracted. A submersible pump attached to a float is used to pump the ground water that collects in the ground-water collection system. The ground water pumped from the ground-water collection system is piped to the on-site pre-treatment plant for removal of chromium before being discharged to the City of De Pere sanitary sewer. Construction of the ground-water collection system is described in Appendix C of the RI (HSI, 1995).

1.1.2 Zinc Shop

1.1.2.1 Site Description

The Zinc Shop is located at 315 South Sixth Street in the City of De Pere, Wisconsin (Figure 1-1). The parcel of land occupied by the Zinc Shop covers approximately 0.61 acre. There are private residences immediately to the north and south of the property and an Airborne Express distribution facility, formerly a farmers' cooperative, to the east. Across Sixth Street, to the west, are private residences. The municipal well closest to the site is located slightly beyond the homes to the west, approximately 250 feet from the site. The Fox River is approximately 1/4 mile to the north and east of the Zinc Shop. An elementary school, a high school, and a small private college are all located within 1/8 mile of the site (WDNR, 1989a).

1.1.2.2 Site History

Better Brite began operations of the 315 South Sixth Street facility in the late 1960s. When the business opened, vertical in-ground dip tanks were used for chromium plating operations. Specific information of the facility operation is not documented.

A description of the site history was presented in the SER (HSI, 1992) and the RI (HSI, 1995). A 1925 Sanborn map shows the Albers and Rupiper Lumber and Millwork facility at the present day Zinc Shop site. At this time, a bulk station of the Winona Oil Company was located to the southeast of the lumber and millwork facility. The 1951 Sanborn maps indicate that a bulk oil station owned by Standard Oil Company was located to the east of the Zinc Shop site. The gas tanks from the Winona Oil Company were still present to the southeast, but in 1951 they were labeled as belonging to the Progressive Farmers Oil Company. On the 1953 Sanborn map oil tanks are listed to the northeast but not shown.

In February, 1967 Better Brite purchased, by land contract, the Sixth Street property from Leland Rupiper. At this time, the lumber yard at 315 South Sixth Street was converted into a chromium plating operation by Better Brite. In March of 1973 the land contract was satisfied and the deed to the property transferred to Better Brite. Better Brite opened an additional chromium plating facility in the mid 1970's at 519 Lande Street, and in the late 1970's, the main function of the Sixth Street facility shifted from chromium to zinc plating. The Sixth Street facility is now referred to as the Better Brite Zinc Shop (ID# 006132088) and the Lande Street facility as the Better Brite Chrome Shop (ID# 560010118).

Through the 1970's poor operational practices allowed plating solutions and rinse water to flow from the building between the floor and sill plate along the south and east sides of the building. On February 13, 1980, in response to a complaint from a neighbor, the first samples of ponded water were collected by the WDNR and analyses of the soils established the presence of contamination at the site. These samples were collected near the south edge of the Zinc Shop building along the property line. Laboratory analysis confirmed that the water contained between 8.1 and 56 parts per million (ppm) zinc, between less than 0.1 and 0.6 ppm chromium, and between 0.1 and 0.6 ppm cyanide.

On April 21, 1983, a neighbor complained about spillage of wastewater from the Zinc Shop. WDNR investigated and observed that a hose, extending from a pump in a below grade loading dock to a sanitary sewer, was leaking and forming a puddle. The puddle ultimately flowed to a storm sewer about 150 feet away. Analyses of the water samples collected by the WDNR revealed a concentration of 8.4 ppm dissolved zinc in the puddle; 4.9 ppm dissolved zinc and 25 ppm cyanide at the loading area; and 5.6 ppm total zinc at the inlet to the storm sewer. Analysis for chromium content was not completed (WDNR, 1983a).

On May 30, 1983, an inspection of the facility was conducted by personnel from the Air Management Section of WDNR. They observed rinse waters from within the building mixing with spilled chemicals around drums and running out the door, as well as dead vegetation between the sidewalk and South Sixth Street. Two composite surface soil samples were collected and analyses of the soils revealed that the samples contained between 270 and 380 mg/kg cyanide, 2,800 and 2,600 mg/kg sodium, 1,500 and 2,600 mg/kg zinc, 100 and 170 mg/kg chromium and 28 and 38 mg/kg cadmium. Based on this information, it appears sodium cyanide and a mixture of plating solution was spilled out the door of the facility (WDNR, 1983b).

On or about September 5, 1985, Better Brite filed a voluntary petition for corporate reorganization under Ch. 11 of the Bankruptcy Code. Between September 16, 1985 and August 27, 1986, John Zenner operated the Zinc Shop as examiner/trustee (Weston-Major, 1990b). During this time, Better Brite installed and operated an industrial wastewater treatment facility. Operation of this system commenced on or about May 11, 1986, and continued until approximately July 14, 1986. During this time, drums of sludge waste were generated (WDNR, 1986a). The actual effectiveness of this system is unknown.

On September 27, 1985, a sampling program was conducted by the WDNR around the Zinc Shop facility. Six soil samples were collected at locations where liquids were observed leaking from the building and areas with stressed or no vegetation. Three samples were collected along the southern property line from 0 to 6 inches in depth. The fourth sample was collected immediately adjacent to the Zinc Shop building from 0 to 6 inches in depth from about the middle of the building along its east side. The fifth and sixth samples were collected along the middle of the east wall of the building from depth of 0 to 6 inches and 6 to 12 inches. Analysis of these samples revealed that the soils contained between 410 and 13,000 mg/kg zinc, 6.9 and 64 mg/kg cyanide, 55 and 1,100 mg/kg chromium, 18 and 460 mg/kg lead, and 1 to 43 mg/kg cadmium (WDNR, 1985).

The U.S. EPA air photo review indicated that the building seen along the northern site boundary had been removed by the time the June, 1986 photograph had been taken. On June 27, 1986, the WDNR collected two water samples from the sump in the basement of the 401 South Sixth Street residence, located immediately south of the Zinc Shop. The samples contained chromium concentrations of 1.1 and 5.8 mg/ℓ (WDNR, 1986e).

On August 8, 1986, the WDNR documented a "toxic and hazardous materials incident" at the Zinc Shop facility in which the treatment tank overflowed and approximately 15 gallons of liquid flowed into Sixth Street. The incident was addressed by the facility personnel and the liquid was cleaned up (WDNR, 1986d).

In December 1986, John Zenner officially purchased the Zinc building and its equipment (with exception of the hazardous waste accumulated at the site). He leased the property underlying the building and incorporated under the name, the Zinc Shop, Inc. Operations at the Zinc Shop, Inc. continued until July 1989.

Since 1980, there have been ongoing investigations and litigation between the State of Wisconsin and The Zinc Shop, Inc.; Platers, Inc.; Better Brite Plating, Inc.; David Matyas (Bank Trustee for Better Brite); and John Zenner (Bank Examiner for Better Brite Plating, Inc. and owner of Platers Inc. and Zinc Shop, Inc.) in regard to spills, hazardous waste and wastewater violations (WDNR, 1991c).

1.1.2.3 Corrective Measures

During the initial investigations, several corrective measures were implemented to remove and/or contain heavy metal and VOC contaminants at the Zinc Shop property. Plating operations at the Zinc Shop were discontinued in 1989. Discontinuing plating operations at the Zinc Shop stopped the generation of additional hazardous material at the site.

The disposal of hazardous material at the Zinc Shop was completed by the U.S. EPA EERB in early 1990. The disposal included hazardous material stored or abandoned on-site including plating solutions and sludge stored in drums, vats, and tanks. Some of this material had been stored on site in excess of the legal holding time (Wisconsin Administrative Code {WAC} Chapter NR 600).

The U.S. EPA EERB constructed a ground-water collection sump along the east side of the Zinc Shop building (Figure 1-3). The sump began operation in August of 1990. Between August of 1990 and March of 1991, approximately 40,000 gallons of contaminated ground water had been pumped from the underlying aquifer (HSI, 1992). Between February 1991, and September 1991, approximately 33,000 gallons were transferred from the Zinc Shop to the Chrome Shop for pretreatment in the U.S. EPA constructed pretreatment facility (WDNR, 1991c). Extracted ground water was transported via a tanker truck to the water pre-treatment facility constructed at the Chrome Shop for treatment prior to discharge to the De Pere sanitary sewer.

In March of 1991, the floor of the Zinc Shop building and the carousel plating machinery were decontaminated by U.S. EPA contractors using a steam cleaner. Two floor sumps were also cleaned. Once the building had been decontaminated a sealant was applied to the building floor to limit the potential for exposure.

A fire destroyed the Zinc shop in September of 1992. Because all hazardous substances had been removed from the building during initial removal activities, the fire did not result in the release of any hazardous substances to the environment. After the fire the TAT and the subcontractor crew began dismantling the remains and removing the foundation. The foundation was finally removed in November 1992. In addition, the two 15-foot long vertical in-ground dip tanks found beneath the foundation of the Zinc Shop were removed, emptied, and disposed of as scrap.

After the foundation was removed, the crew began excavating the soils in the area of the former foundation. The purpose of this excavation was to remove the soils with the highest contaminant concentrations. The final excavation had a total depth of approximately 20 feet and encompassed the area of the former foundation. The approximate limits of the excavation are shown as the boundary of the ground-water collection system completed in 1993 on Figure 1-3.

The soil excavated from beneath the former location of the Zinc Shop was segregated into characteristic (D007) hazardous waste and special waste soil piles and taken off-site for proper disposal. Approximately 2,752 tons of D007 chromium contaminated soil, concrete, and building debris and 3,280 tons of chromium contaminated special waste soil, concrete, and building debris were removed from the site. Soil samples were collected from the bottom of the pit and submitted for laboratory analyses to confirm that no impacted soil was left in place. The analytical results indicated that no soil impacts were present above allowable concentrations at the bottom of the pit. Excavation activities were completed in January 1993.

The U.S. EPA installed a ground-water extraction sump in the former excavation to facilitate recovery of contaminated ground water. This system replaced the smaller ground-water collection system constructed at the site during the initial phase of removal activities. Upon completion of excavation activities, a 40-mil liner was spread over the pit bottom. Six-inch diameter perforated pipe and two vertical clean out pipes were installed in trenches at the base of the excavation. The trenches were backfilled with pea gravel and covered with filter fabric. The pit was then backfilled with 3/4-inch washed limestone. The collection pipe for the ground-water collection system is a large vertical standpipe which was placed at the low point of the excavation. The standpipe was wrapped with filter fabric and surrounded with 1½-inch gravel. Ground water is pumped out of the sump using a vacuum tank truck. The impacted water is then taken to the existing Chrome Shop pretreatment plant for removal of chromium impacts before being discharged to the City of De Pere sanitary sewer.

Two monitor wells (MW-4 and MW-4A) were installed on a residential property to the west of the Zinc Shop in February 1993 as part of Phase II removal activities (Figure 1-3). The monitor wells are located on the west side of South Sixth Street, directly across the street from the Zinc Shop. One well was completed as a water table monitor well and the second well was completed as a piezometer screened near the top of the bedrock surface. Both wells were constructed of 4-inch inside diameter (ID) polyvinyl chloride (PVC) well materials and were intended for possible use as ground-water extraction wells if impacted ground water was detected at this location. As a protective measure, the Grant Street municipal well has also been sampled more frequently than normally required by the WDNR and the City of De Pere. The frequency of the well sampling was increased to allow for detection in the event contamination should enter the well head from the site. <u>To date no elevated levels of contaminants of concern have been detected in this well.</u> Sampling for chromium, zinc, and cyanide is currently performed on a semi-annual basis in addition to standard sampling (bacteria, etc.). VOC samples are collected and analyzed periodically.

1.2 Purpose and Scope

The purpose of this document is to briefly describe and document the overall management strategy for performing the design, construction, operation, maintenance, and monitoring for the ground-water operable unit. This document includes a description of the responsibility and authority of personnel involved with the remedy implementation, including a description of the qualifications of key personnel directing the design and construction of the remedy. A project schedule which identifies the timing for initiation and completion of the remedial design is also included in this work plan.

2.0 SELECTED REMEDY DESCRIPTION

2.1 Chrome Shop

The remedy selected to address soil and ground-water contamination at the Chrome Shop includes institutional controls, soil washing, and in-situ soil solidification/stabilization. The institutional controls include the construction of fences around the site to limit access to the wells, equipment, and clay cap; posting warning signs; and obtaining deed restrictions on the present and the future use of the Chrome Shop site or other affected properties. Soil washing will be utilized on the sump backfill. The sump backfill material will be washed and the rinse water will be treated in Better Brite's batch treatment plant. The washed backfill will then be hauled off-site as clean fill.

A treatability study will be performed on representative samples of the Chrome Shop soil (including both the native clay and the pea gravel used to backfill the sump area) to determine the feasibility of solidification/stabilization. The treatability study will assess the best stabilization agent for the site, the leachability of the contaminants after treatment, the effect of residual VOCs in the ground water upon solidification/stabilization, and the projected permeability of the clay once solidified/stabilized.

The in-situ solidification and stabilization process technology immobilizes organic and inorganic compounds in wet or dry soils using reagents to produce a cement-like mass. The additives generate a complex, crystalline connective network of inorganic polymers in a two-phase reaction. In the first phase, contaminants are complexed in a fast-acting reaction. In the second phase, macromolecules build over a period of time in a slow-acting reaction. This creates an extremely low permeability mass which inhibits the potential for movement of the contaminants from the mass, thus stabilizing the contaminants permanently.

During construction, a crane-mounted bottom-opened cylinder will be lowered into the soil. Inside the cylinder, mixing blades will mix down to the required depth (approximately 20 feet) in an up and down motion. Meanwhile, fluid or powdered solidification/stabilization agent will be added into the subsurface. A suction will be kept on the head space of the bottom-opened cylinder to pull any dust and vapors to the vapor treatment system comprised of a dust collector and activated carbon treatment tanks. The construction method consists of creating alternating primary columns which are allowed to set. Secondary columns will then be then installed which overlap the primary columns resulting in continuous treatment of the impacted area. The total volume of soil at the Chrome Shop site which is estimated to require treatment is 10,000 cubic yards. The extent of the area to be treated corresponds to the area of the ground-water contaminant plume, which exceeds WAC NR140 Preventive Action Limits (PALs). The depth to which the treatment will occur is 20 feet bgs, which is coincident with the base of impacted ground water.

As a result of the stabilization process, the volume of material treated will increase by 10% to 30% depending on the treatment chemicals used. This will result in a mound in the treated area. The extra material will be graded and left at the Chrome Shop site.

2.2 Zinc Shop

2.2.1 Ground-water Control and Remediation

Under the existing ground-water recovery and treatment program at the Better Brite sites, ground water collected at the Zinc Shop site is transported to the existing pretreatment plant at the Chrome Shop site for pretreatment and discharge to the DePere POTW. There will no longer be a need for the treatment system at the Chrome Shop site once the in-situ solidification/stabilization is complete. Therefore, the existing ground-water pretreatment system at the Chrome Shop will be transported and reassembled at the Zinc Shop site.

Materials and equipment which will be reused at the Zinc Shop include two tanks, a filter press, chemical feed tanks, a control panel, an air compressor, desk, bathroom fixtures, and walls and roofing material. A new concrete pad will be constructed at the Zinc Shop site for installation of the pretreatment building.

Ground water at the Zinc Shop will be recovered from the existing sump. The existing batch pretreatment plant, has a holding tank which is used to store water prior to batch pretreatment. Once the tank is nearly full, the contents of the tank will be pumped to the batch pretreatment tank for pretreatment. Typically, a volume of 5,600 gallons of water is pretreated at a time.

Sulfuric acid, sodium bisulfite, and sodium hydroxide are the chemicals used in the precipitation process. The resulting chromium hydroxide precipitate is allowed to settle in the batch pretreatment tank with the aid of an anionic polymer flocculating agent. Other insoluble heavy metal hydroxides such as cadmium, lead, nickel, and silver hydroxides are also insoluble at a pH of approximately 8.5 standard units and also form precipitates during this process.

Metal hydroxide sludge is dewatered in a plate and frame filter press, thus reducing the volume, toxicity and mobility of the waste stream compared to the volume of impacted ground water being treated. The dewatered metal hydroxide sludge cake is transported and disposed off-site at a licensed Resource Conservation and Recovery Act (RCRA) treatment, storage and disposal facility as characteristic hazardous waste (D007). According to the U.S. EPA document entitled "A Water Treatment System For Removal of Chromium from Ground Water" (U.S. EPA, 1991), one drum (55 gallons) of dewatered sludge is formed for every 5,000 gallons of ground water treated. This is confirmed by records of the initial operation.

Pretreated water will be decanted from the batch pretreatment tank and will be discharged to the City of De Pere sanitary sewer for final treatment at the De Pere Publicly Owned Treatment Works (POTW). Available information from the existing operation indicates that the concentration of total chromium in the treated water is below 1 mg/ℓ which is well below the pretreatment limit of 7.0 mg/ℓ. Therefore, the existing pretreatment system performance adequately meets the pretreatment limits for the De Pere POTW.

The concentration of VOCs present in the ground water are not reduced by the existing pretreatment plant. It is expected that some of the VOCs are volatilized during the pretreatment process, or possibly adsorbed on the sludge, and the remaining VOCs are discharged for final treatment at the De Pere POTW. Because the De Pere POTW does not have pretreatment standards for VOCs, the discharge of water with residual VOCs is an acceptable practice.

The De Pere POTW, which currently operates the pretreatment system, has indicated that there are no indications of problems with the existing pretreatment system.

There is currently an Operation and Maintenance agreement with the City of De Pere POTW. Extending the agreement between the WDNR and the City of De Pere to operate the system after it's transferred to the Zinc Shop appears possible based on discussions with both parties. However, there are administrative issues related to manifest responsibilities, monitoring, and maintenance which will need to be addressed when the system is used as a permanent pretreatment alternative.

Institutional controls will be used to provide additional protection for human health and the environment. These institutional controls will include the construction of a fence around the site to limit access to the wells, equipment, and clay cap; posting warning signs; and obtaining deed restrictions on the present and the future use of the Zinc Shop site.

2.2.2 Basement/Sump Exposure Mitigation

To address potential exposures to contaminants through basement and sump impacts, the WDNR will notify the occupants of the affected structures of the seepage and the potential health risks. The WDNR will also pursue deed restrictions on the affected structures and property to limit use and exposure to the impacted areas, and ensure that future occupants would be notified of the potential problems.

In addition to the institutional controls, the basement sumps which collect impacted ground water will be sealed and the discharge from the sump pumps will be routed to the Zinc Shop sump. Also, the exterior and interior of the basement walls will be sealed with impermeable, waterproof substances and a foundation drain with a sump along the base of the exterior basement walls will be constructed. Pending a determination of the soundness of the building foundations, soil from the vicinity of the outside walls will require excavation, sampling, and characterization for off-site disposal in order to allow sealing of the outside portions of the walls and construction of foundation drains.

Both the outdoor and indoor walls will be waterproofed once with a waterproof plaster and once with a tar substance. It is expected that the waterproofing will be guaranteed for 10 years by the contractor. It is assumed that all excavated material will be characterized for appropriate off-site treatment/disposal. Additionally, 4-inch diameter drain tile would be installed and pitched to a sump. Accumulated water from the sump and foundation drain would be discharged to the Zinc Shop sump for treatment. The excavated areas would then be restored with gravel, filter fabric, and black dirt to grade. Note that there is no ongoing maintenance included in the costs. Maintenance is assumed to be the owner's responsibility.

2.3 Ground-water Monitoring

Ground-water samples will be collected from select monitor wells and the Grant Street municipal well. Initially, semi-annual samples will be collected from the area surrounding the Chrome Shop and from the area around the Zinc Shop. At the discretion of the WDNR, this sampling frequency may be reduced in the future. Monitor wells will be selected to characterize contaminant concentrations and the extent of the contamination as definable with the existing monitor well network. Details of the long-term ground-water monitoring will be presented in the Ground-water Monitoring and Sampling plan which will be prepared and submitted along with the Remedial Design.

3.0 REMEDIAL DESIGN / REMEDIAL ACTION TASKS

3.1 Additional Studies

As part of the remedial design, predesign soil and ground-water samples will be collected. Soil samples will be collected for a treatability study, and soil samples will be collected from select locations near the Zinc Shop. During the predesign soil sampling, basements will also be visually inspected to evaluate the stability of the structure and composit soil sampling will be conducted. Baseline ground-water sampling will also be conducted. The baseline ground-water sampling will include collecting water levels from all the existing site wells, and collecting ground-water samples from select locations for VOC, total chromium, hexavalent chromium, cyanide, and metals. Finally, wells which are no longer required at the site will be abandoned. A complete description of the additional studies is provided in the Predesign Investigation and Treatability Work Plan (HSI GeoTrans, 1997)

3.2 Task 2 - Remedial Design

The RD plans and specifications listed below will be submitted to WDNR in order to implement the remedy at the site. Before submitting the design plans and specifications, HSI will coordinate and cross check the specifications and drawings, and perform complete review of the edited specifications. Construction plans and performance specifications will be prepared to implement the remedial action at the site as described in the ROD and the SOW. All plans and specifications will be developed in accordance with U.S. EPAs Superfund Remedial Design and Remedial Action Guidance (OSWER Directive No. 9355.0-4A), WAC Ch. NR724, and shall demonstrate that the remedial action shall meet all objectives of the ROD and the SOW, including performance standards. A summary of the remedial design phases follows:

1. Preliminary Design Meeting

HSI GeoTrans will meet with the WDNR when the design effort is about 30% complete. The preliminary Design will include, at a minimum, the following:

- the Predesign Investigation and Treatability Study Work Plan results;
- preliminary plans, drawings, and sketches, including design calculations;
- design assumptions and parameters, including design restrictions, soil areas and volumes, contaminant concentrations, excavation conditions, and expected removal;
- proposed cleanup verification method, including methods for use of a laboratory to screen for soil compliance levels during excavation and stabilization and compliance with applicable, or relevant and appropriate requirements (ARARs);
- outline of required specifications;
- proposed siting/locations of construction activity;
- real estate, easement, and permit requirements;
- preliminary construction schedule, including contracting strategy;
- Performance Standard Verification Plans outline;

- Quality Assurance Project Plan (QAPP) outline (to address performance /cleanup standard verification);

- Health and Safety Plan (H&SP) outline (modification of existing H&SP to cover Remedial Action (RA) activities); and

- Contingency Plan outline.

HSI GeoTrans will provide copies of relevant documents and technical memoranda to the WDNR one to two weeks prior to the 30% design meeting to allow adequate time for agency review.

2. Sixty Percent Design Progress Meeting

3. Seventy-Five Percent and Final Design Deliverables

HSI GeoTrans will submit the 75% design deliverable when the design effort is 75% complete and will submit the Final Design when the effort is 100% complete. The 75% Design will fully address all comments made during the Preliminary Design Meeting. The Final Design will fully address all comments made on the 75% Design and will include reproducible drawings and specifications suitable for bid advertisement. The Final Design will serve as the Final Design if the WDNR has no further Comments and issues the notice to proceed. The 75% and Final Design submittals will include those elements listed for the Preliminary Design meeting, as well as Final Design plans, drawings, and sketches, including design calculations.

3.3 Task 3 - Support Plans

3.3.1 Ground-water Monitoring and Sampling Plan

A detailed Ground-water Monitoring and Sampling Plan describing the type, frequency, location, and a schedule for post-RA ground-water sampling and monitoring, including a QAPP for ground-water sampling will be submitted to WDNR. The monitoring plan will, at a minimum, contain the following:

- Analytical parameter list,
- Analytical methodologies,
- Monitoring schedule,
- QAPP for ground-water sampling,
- H&SP for ground-water sampling, and
- Reporting requirements.

As part of the RD report, a plan will be submitted which defines the procedures which will be implemented if the remedial performance monitoring data indicates that the remedy or a specific remedial component is not attaining the design objective. This plan will define notification requirements and implementation schedules.

3.3.2 Contingency Plan

HSI GeoTrans will submit a Contingency Plan (CP) describing procedures to be followed in the event of an emergency or accident at the site. The CP will include, at a minimum, the following:

1. Name of the person or entity responsible for responding in the event of an emergency incident;

2. Plan and date(s) for meeting(s) with the local community, including local, state, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals;

3. First aid medical information;

4. Air Monitoring Plan; and

5. Spill Prevention, Control, and Countermeasures (SPCC) plan (if applicable), as specified in 40 Code of Federal Regulations (CFR) Part 109 describing measures to prevent, and contingency plans for, potential spills and discharges from materials handling and transportation.

3.3.3 Field Sampling Plan

A Field Sampling Plan will be prepared which will describe the sampling procedures to be implemented for soil and ground-water sample collection and air monitoring during soil stabilization. The field sampling plan will, at a minimum, contain the following:

- Analytical parameter list,
- Analytical methodologies,
- Monitoring schedule,
- Reporting requirements, and
- Specified Performance Standards, Levels, and Locations.

3.3.4 Construction Quality Assurance Plan

HSI GeoTrans will submit a Construction Quality Assurance Plan (CQAP) that describes site-specific components of the quality assurance program; the CQAP will ensure that the completed project meets or exceeds all design criteria, plans and specifications. At a minimum, the CQAP will include the following elements:

1. The responsibilities and authorities of all organizations and key personnel involved in the construction of the RA. The plan will identify a CQA officer.

2. The qualifications of the CQA officer and supporting inspection personnel will be presented in the CQAP and will demonstrate that s/he possess the training and experience necessary to fulfill the identified responsibilities.

3. The protocols for sampling and testing used to monitor construction.

4. Identification of proposed quality assurance sampling activities, including the sample size, location, frequency of testing, acceptance and rejection of data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation. A description of the provisions for the final storage of all records will be included.

5. Reporting requirements for the CQA activities shall be described in detail in the CQAP. This shall include items such as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records will be presented in the CQAP.

3.3 Task 4 - Post Remedial Design Support

HSI GeoTrans will provide the support required to prepare contract bidding documents and issue the Invitation for Bids or the Request for Proposals. The post remedial design support will include, at a minimum, the following activities:

1. Bid solicitation for construction services;

2. Printing and distribution of appropriate contract documents to prospective bidders;

3. Issuance of amendments to contract documents in Item #2 if, after solicitation, additional information becomes available that all bidders should be made aware of;

4. Arrangement and attendance of pre-bid meetings to provide clarification of plans, specifications, and contract documents to all bidders;

5. Resolution of bidder inquiries and documentation of all contact with potential bidders; and

6. Participation in on-site visits that may be required to further clarify the services required.

3.4 Task 5 - Project Management / Reports and Plans

HSI GeoTrans will perform the management of this project including, but not limited to, the day-to-day management, monthly technical, financial, and schedule status reports, compliance with contract administration requirements, coordination of personnel and budget, participation in weekly status calls with the WDNR, attendance at project meetings, and other administrative duties. A summary of the required documentation is presented in the following sections.

3.4.1 Progress Reports

At a minimum, WDNR will be provided with signed, monthly progress reports during the pre-design and design phases, which include:

Technical Status

a. A description and estimate of the percentage of the RD completed;
b. Summaries of all data and results;
c. Summaries of all changes made in the RD during the reporting period;
d. Summaries of all problems or potential problems during the reporting period;
e. Actions being taken to rectify the problems;
f. Changes in personnel during the reporting period;
g. Travel;
h. Subcontractors; and
i. Projected work for the next reporting period.

Financial Status

a. Actual professional hours and cost expenditures by task for the reporting period;
b. Project to date cumulative professional hours and cost by task;
c. Subcontractor hours and cost; and
d. Projections of professional hours and cost to complete each task.

Schedule Status

a. A list of project tasks with planned and actual start dates;
b. A schedule with planned and actual dates for milestones and submittal of deliverables to the WDNR; and,
c. Schedule variances and recommended solutions

4.0 PROJECT ORGANIZATION AND PERSONNEL

4.1 Project Organization

A project organizational chart is presented in Figure 4-1 illustrating the organizations and personnel involved in conducting the RD/RA.

4.2 Enforcement Agencies

4.2.1 Wisconsin Department of Natural Resources (WDNR)

The WDNR is the lead agency and is responsible for providing oversight. The WDNR project coordinator is Ms. Kristin Nell. Her responsibilities encompass project oversight and assuring compliance with the ROD and SOW. The WDNR is responsible for final review of the RD and all other deliverables.

4.2.2 U. S. Environmental Protection Agency (U.S. EPA)

The U. S. EPA is responsible for providing Superfund support and federal ARARs. The U.S. EPA project coordinator is Mr. Jon Peterson.

4.3 HSI GeoTrans.

HSI GeoTrans is responsible for implementing the requirements of the ROD and SOW. HSI has assigned specific responsibilities to each member of the HSI GeoTrans project team. Resumes of the key HSI project team members are attached. The technical/administrative functions of each team member are described below.

4.3.1 Project Manager

Ms. Judy Fassbender is the HSI GeoTrans Project Manager. The project manager has primary responsibility for oversight of all activities scheduled to be performed during the RD/RA. Ms. Fassbender will provide technical direction to the project personnel, be responsible for assuring HSI GeoTrans conformance to the contract requirements, and provide technical and financial control. The project manager will also be responsible for assuring that proper corporate resources are balanced with the project requirements and provide peer review of the project deliverables.

4.3.2 Project Quality Assurance (QA) Coordinator

Mr. Daniel L. Morgan, P.E., will serve as the RD/RA QA Coordinator. The RD/RA QA Coordinator is responsible for periodically auditing the tasks and responsibilities of the other HSI GeoTrans team members. The RD/RA QA Coordinator will conduct audits to assure that QA protocols are in conformance with the CQAP and the QAPP. The RD/RA QA Coordinator will also provide peer review on project deliverables.

4.3.3 Project Health and Safety Officer

Ms. Jennifer J. Johanson, HSI GeoTrans Director of Health Sciences, will serve as the Project Health and Safety Officer. The Project Health and Safety Officer is responsible for developing a site specific health and safety plan with contingencies to deal with all anticipated hazards specific to tasks to be performed during the field work. In addition, the Health and Safety Officer is responsible for reviewing any site incident reports and implementing any corrective measures deemed necessary to prevent recurrences of incidents.

4.3.4 Project Remedial Design Task Coordinator

Mr. Jeffery W. Rackow will serve as the RD/RA Task Coordinator. The RD Task Coordinator is responsible for coordinating the design of the remedial actions required by the ROD, and preparation of the associated RD Report. The RD Task Coordinator also provides peer review of other project deliverables related to the RD. The RA Task Coordinator, who is referred to as the project director in the CQA plans, will be responsible for coordinating all on-site activities, including coordinating with sub-contractors and vendors and supervision and documentation of field activities.

4.3.5 Construction Contractors

HSI GeoTrans will prepare bid specifications for use in the selection of a construction contractor following the approval of the RD by WDNR. HSI will assist the WDNR in identifying potential qualified contractors and also assist the WDNR in evaluating submittals for contractor selection.

5.0 PROJECT SCHEDULE

The proposed schedule for conducting the RD is presented in Figure 5-1. It should be noted that several activities depend on the timely completion of other activities and are sequential in task scheduling.

The ROD was issued in September 1996. The Predesign Investigation and Treatability Work Plan will be submitted concurrently with this RD Work Plan. It is assumed that approval of the Predesign Investigation and Treatability Work Plan will be received in December 1997. The predesign investigation and treatability study will begin the first week of January 1998. The Design Plans, including the Performance Standard Verification Plan, Field Sampling Plan, CQAP, Construction H&SP, and Contingency Plan, will be submitted in April 1998. It is assumed that approval for the final design will be received by May 1998. In addition, by the first week of May 1998, the Ground-water Monitoring Plan, the Ground-water Monitoring QAPP, and the Ground-water Monitoring H&SP will be issued to the WDNR for review. If this schedule is met, it is anticipated that the bid-process for the RD construction can be completed in early June 1998.

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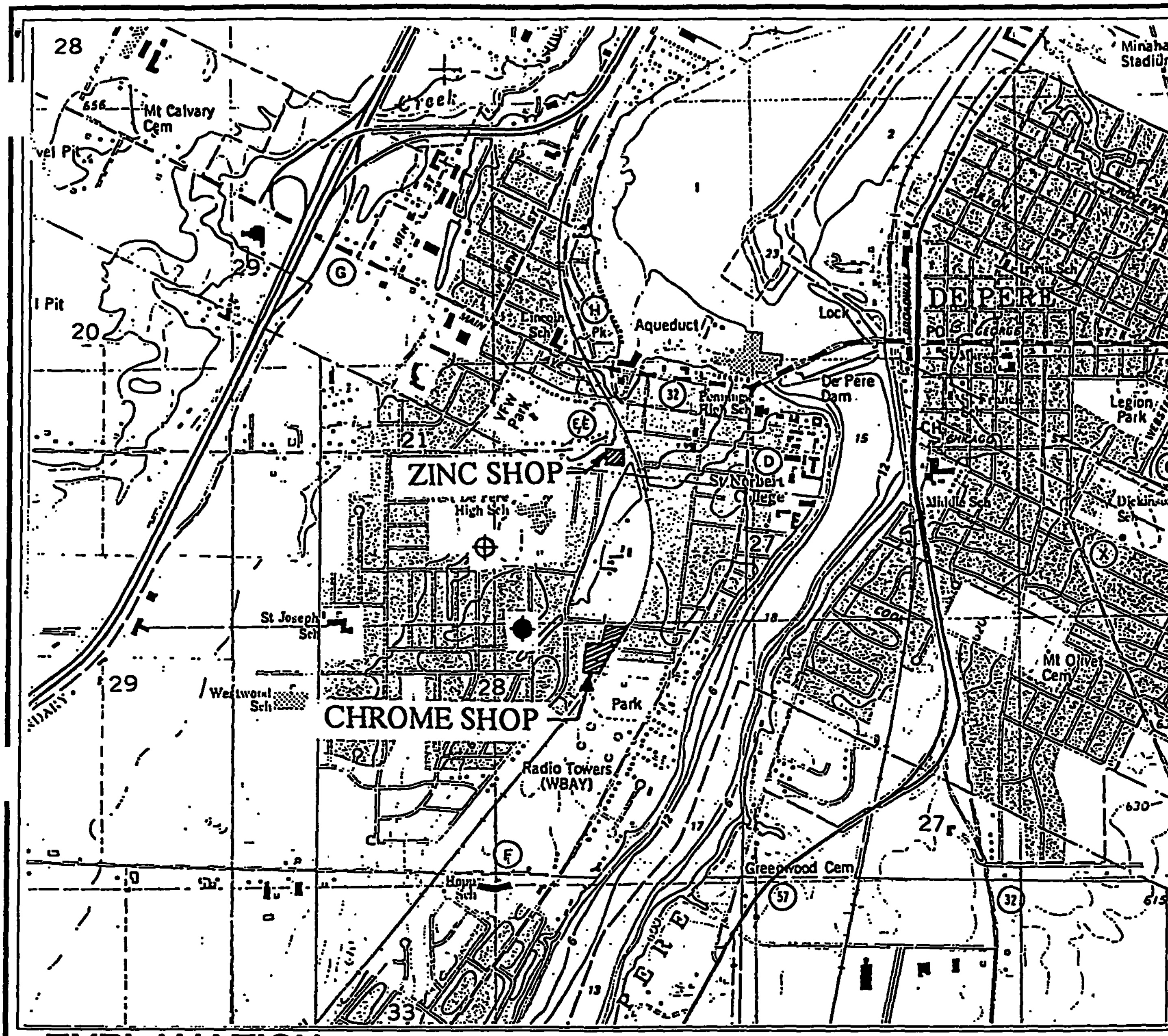


EXPLANATION

- PRIVATE WELL LOCATION
- U.S.G.S. MONITOR WELLS

SCALE

0 5000

FEET

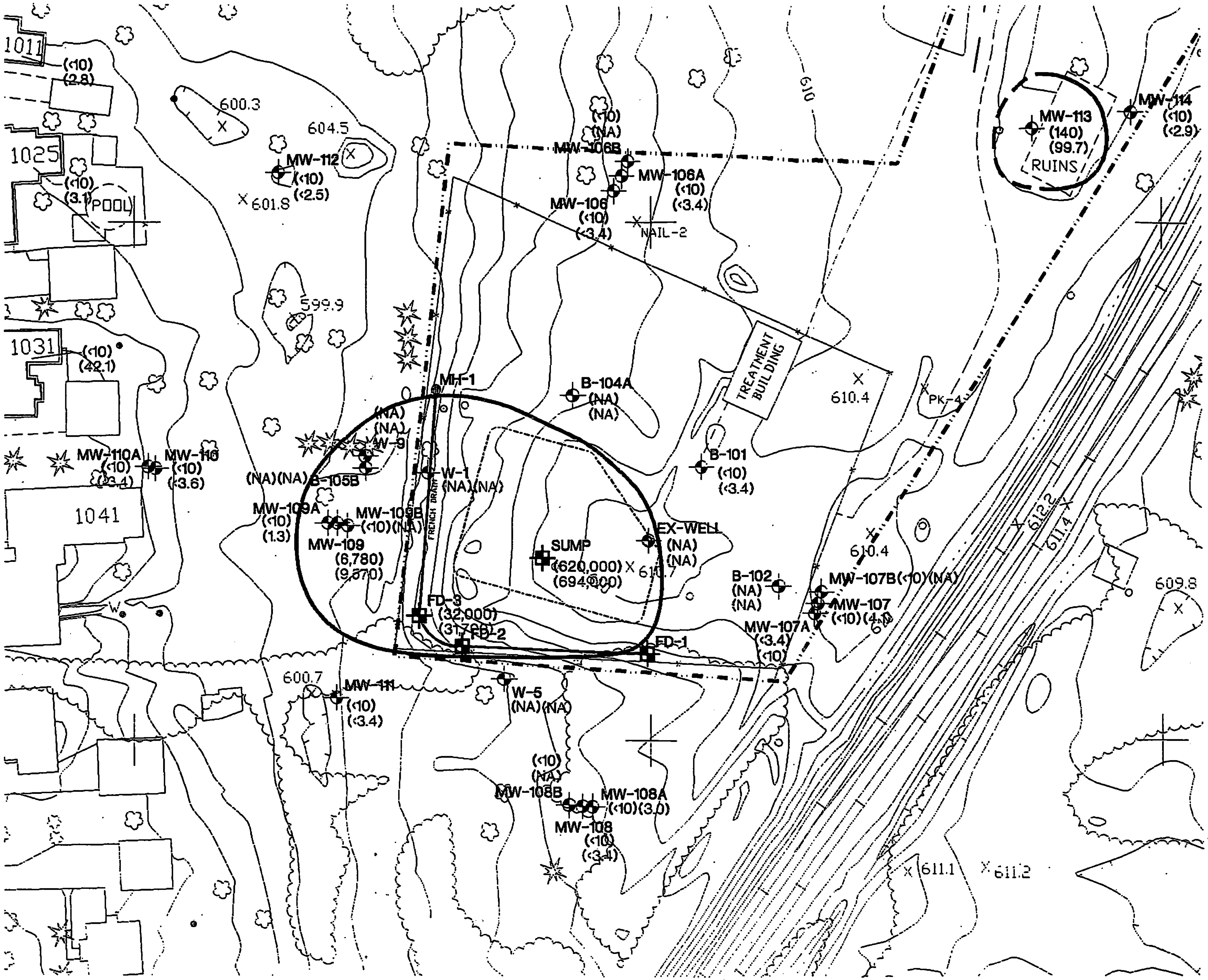
N

National Geodetic Vertical Datum of 1929
Contour Interval 10 Feet

QUADRANGLE LOCATION

Base map from U.S.G.S. 7.5' DePere, Wisconsin

BETTER BRITE EMMENT, WISCONSIN	DATE: 10/02/95 DESIGNED: CTM
SITE LAYOUT and LOCAL TOPOGRAPHY	CHECKED: JEN APPROVED: JLF DRAWN: CTM PROJ: 307483251
HYDRO-SEARCH INC A Tetra Tech Company	Figure 1-1



EXPLANATION

MW-110 — MONITOR WELL LOCATION AND DESIGNATION

SUMP — SUMP ACCESS LOCATION AND DESIGNATION

(<10) — HEXAVALENT CHROMIUM CONCENTRATION IN GROUND WATER (ppb)

(<3.6) — TOTAL CHROMIUM CONCENTRATION IN GROUND WATER (pbb)

(NA) — NOT AVAILABLE

EXTENT OF HEXAVALENT CHROMIUM IN GROUND WATER AND EXTENT OF TOTAL CHROMIUM EXCEEDING NR 140 ENFORCEMENT STANDARDS DASHED WHER INFERRED.

SUMP BOUNDARY

PROPERTY LINE

1011 — BASEMENT SUMP SAMPLING LOCATION

Note : Listed concentrations are highest measured levels from 1994 and 1995 sampling events. Property boundary is approximate.

N

SCALE

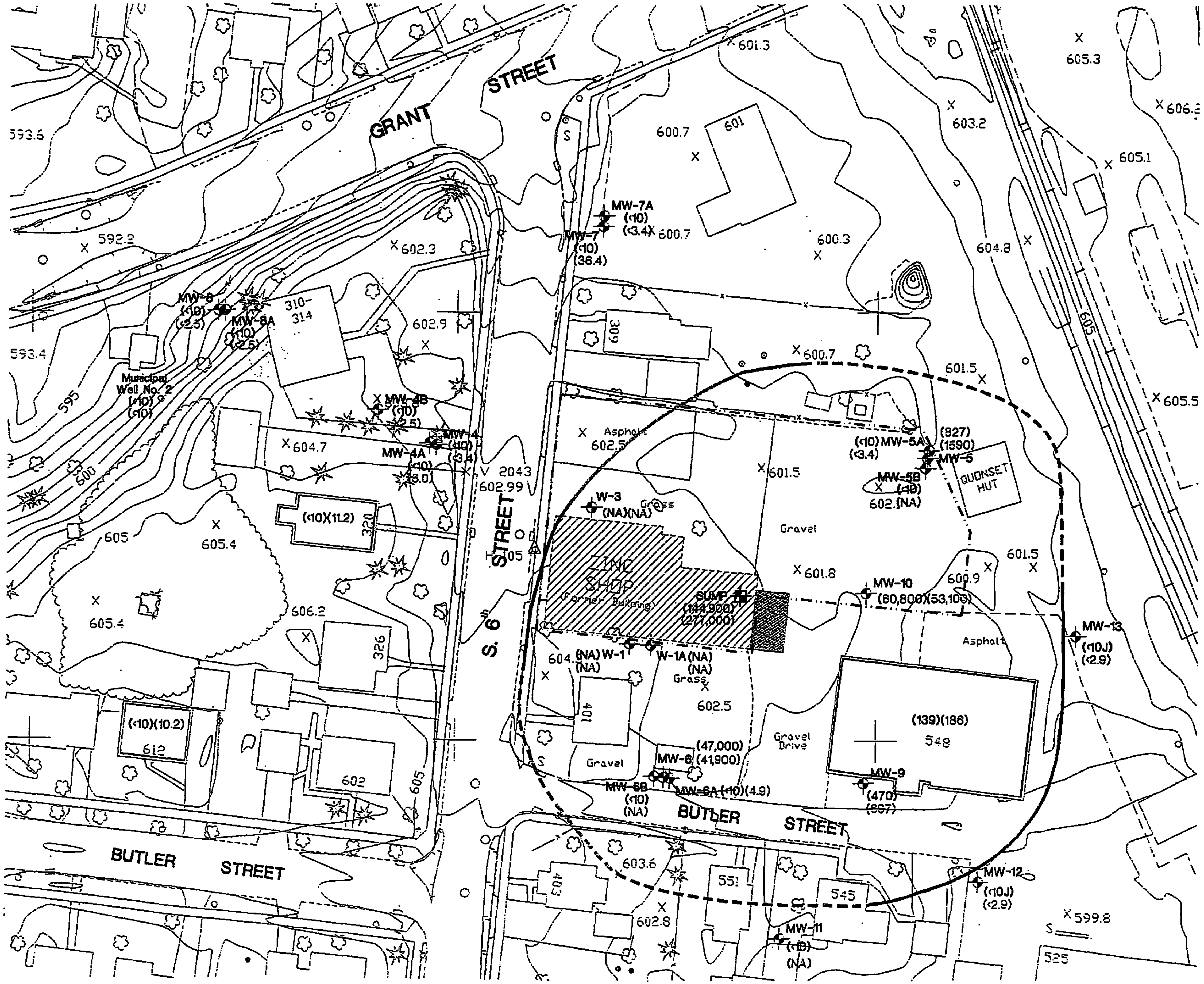
0 — 100

Feet

BETTER BRITE DePERE, WISCONSIN	DATE: 05/04/95
HEXAVALENT CHROMIUM/ TOTAL CHROMIUM IN GROUND WATER CHROME SHOP	DESIGNED: RAG
	CHECKED: JEN
	APPROVED: JLF
	DRAWN: RAG
	PROJ: 301483158
HYDRO-SEARCH INC A Tetra Tech Company	Figure 1-2

Base map from Aero-Metric Engineering, date of photography 11/17/91.

\hsi\148\3158\3158-b13.dwg



Base map from Aero-Metric Engineering, Inc., date of photography - 11/17/91.

EXPLANATION

- MW-9 — MONITOR WELL LOCATION AND DESIGNATION
- SUMP — SUMP ACCESS LOCATION AND DESIGNATION
- GROUND WATER COLLECTION SYSTEM EXCAVATION COMPLETED IN 1993
- GROUND WATER COLLECTION SUMP EXCAVATION COMPLETED IN 1990
- (139) — HEXAVALENT CHROMIUM CONCENTRATION IN GROUND WATER (ppb)
- (186) — TOTAL CHROMIUM CONCENTRATION IN GROUND WATER (ppb)
- (J) — ESTIMATED CONCENTRATION
- (NA) — NOT AVAILABLE
- EXTENT OF DETECTABLE HEXAVALENT CHROMIUM IN GROUND WATER AND EXTENT OF TOTAL CHROMUIM EXCEEDING NR 140 ENFORCEMENT STANDARDS. (DASHED WHERE INFERRED)
- PROPERTY LINE
- SUMP BOUNDARY
- 320 — BASEMENT SUMP SAMPLING LOCATION

Note : Listed concentrations are highest measured levels from 1994 and 1995 sampling events.

N

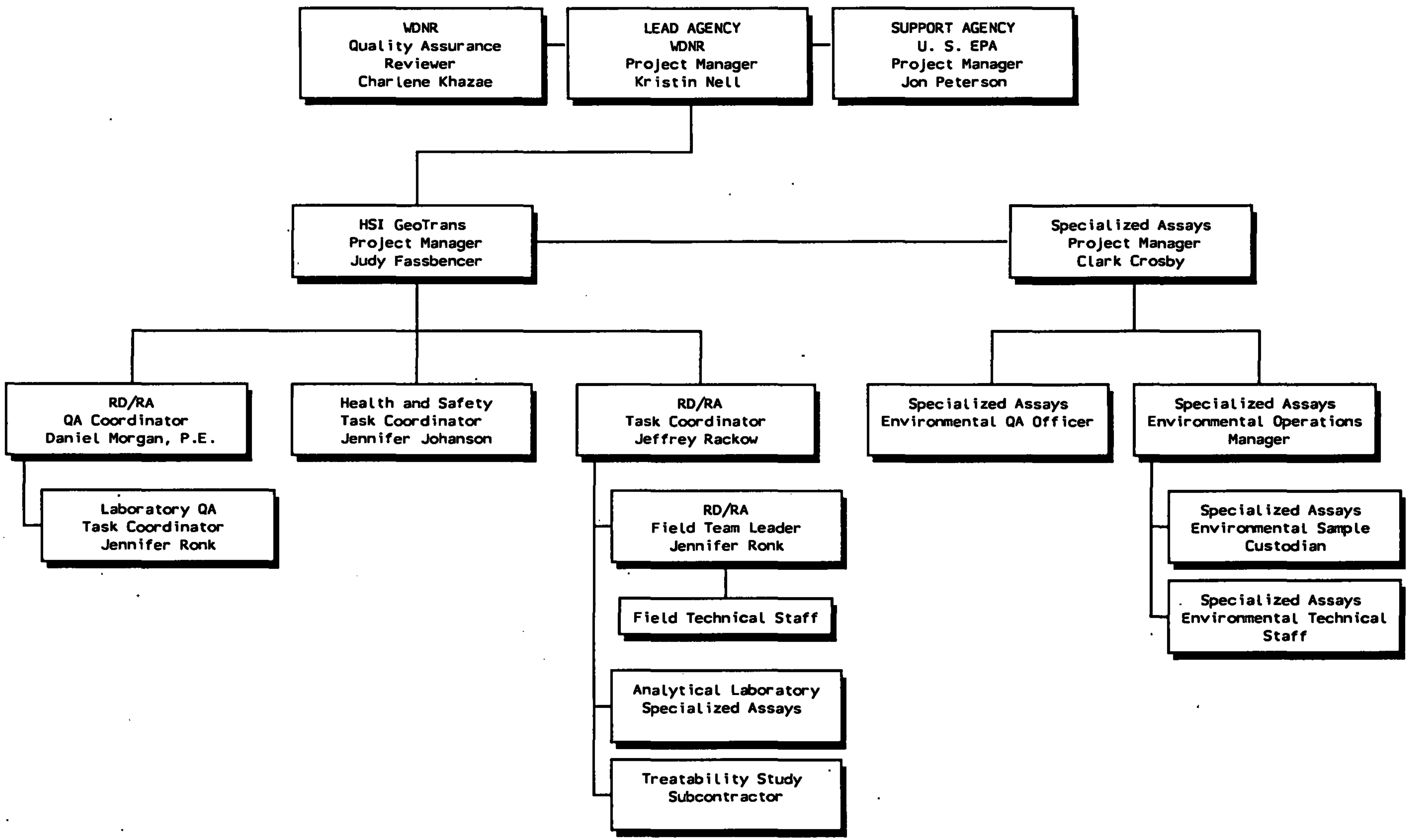
SCALE 0 — 120 Feet

BETTER BRITE DePERE, WISCONSIN	DATE: 05/04/95
HEXAVALENT CHROMIUM/ TOTAL CHROMIUM IN GROUND WATER ZINC SHOP	DESIGNED: RAG
	CHECKED: JEN
	APPROVED: JLF
	DRAWN: RAG
	PROJ: 301483158
HYDRO-SEARCH INC. A Tetra Tech Company	Figure 1-3

/hsi/148/3158/3158-b15.dwg

Figure 2-1

PROJECT ORGANIZATION
AND PERSONNEL



HSI GEOTRANS

PROPOSED WORK SCHEDULE	PROJECT: BETTER BRITE RD PREPARED BY: HSI GEOTRANS, INC. PREPARED FOR: WDNR

TASK DESCRIPTION	December				January				February				March					April				May					June				July			
	7	14	21	28	4	11	18	25	1	8	15	22	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26
Predesign Investigation and Treatability Work Plan																																		
RD Work Plan																																		
Additional Soil/Groundwater Sampling					////																													
Monitor Well Abandonment					////																													
Treatability Study					////	////	////	////	////	////	////																							
Preliminary Design	////	////	////																															
Progress (60%) Design		////	////	////	////	////	////	////	////	////	////	////																						
Intermediate Design (75%)													////	////	////																			
Final Design																////	////	////	////															
Draft Groundwater Monitoring and O&M Plans																			////	////	////	////												
Final Groundwater Monitoring and O&M Plans																								////	////	////								
Post Remedial Design Support																								////	////	////	////	////	////	////				
Progress Reports	////				////				////				////					////				////					////				////			

COMMENTS:

Figure 1-2

HSI GEOTRANS

HSI GEOTRANS
A TETRA TECH COMPANY

175 N. Corporate Drive
Suite 100
Brookfield, Wisconsin
53045
414-792-1282 FAX 414-792-1310

RECEIVED
DEC 17 1997
LMD SOLID WASTE

To: WI Dept of Natural Resources
1298 Lombardi Ave
Green Bay, WI 54304

Date: December 12, 1997

Subject: Better Brite RD Plans

Attn: Ms Kristen Nell

Job. No. F076/301

We are sending the following: X Herewith ____ Under Separate Cover

# of Copies	Item
1	Predesign Investigation & Treatability study workplan
1	RD/RA workplan

Comments: Revised plans are Attached - Responses to your comments on an item by item basis have also been provided. Please call if you have Questions - will talk to you soon!

Transmitted by:

___ First Class Mail
X Federal Express
___ Express Mail
___ Messenger
___ Other

CC: Charlene Khazae
WDNR
101 S. Webster St
PO Box 7921
Madison WI 53707-7921

By: Judy