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PROPOSED PLAN OF REMEDIAL ACTION

Deemer Steel Site - Operable Unit-II
New Castle, DE

DNREC Project No. DE 1244

July 2001

Delaware Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation & Restoration Branch
391 Lukens Drive
New Castle, Delaware 19720

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I. INTRODUCTION

The Deemer Steel Site ("Site") is located at Ninth and Washington Street, in New Castle, Delaware (see Figure 1). In June 1997, Buck Kennett Associates, LLC ("Buck Kennett") entered into a Voluntary Cleanup Program ("VCP") Agreement with the Department of Natural Resources and Environmental Control, Site Investigation and Restoration Branch ("DNREC-SIRB"). Under the provisions of the Delaware Hazardous Substance Cleanup Act, 7 Del. C. Chapter 91 ("HSCA"), Buck Kennett completed a Facility Evaluation ("FE") to evaluate the potential presence of contaminants in the soil associated with historic Site uses. In July 1999, Buck Kennett entered into a second VCP Agreement. Through this second VCP Agreement, Buck Kennett agreed to investigate the potential risks posed to the public health, welfare, and the environment through the performance of a Remedial Investigation and Feasibility Study ("RI/FS"). The purpose of the RI/FS was to obtain sufficient detailed Site information to supplement the earlier FE and develop an appropriate remedial approach. Buck Kennett contracted WIK Associates, Inc. to perform the FE and RI/FS of the Site.

The purpose of the RI/FS was to: 1) characterize the nature and extent of any soil and/or groundwater contamination at the Site, 2) evaluate risks to public health, welfare, and the environment associated with identified contamination, and 3) perform a FS that would identify and recommend a Remedial Action.

This document is the Department's Proposed Plan of Remedial Action ("Proposed Plan") for the Site. It is based on the results of the previous investigations performed at the Site. This Proposed Plan is issued under the provisions of the HSCA and the Regulations Governing Hazardous Substance Cleanup ("Regulations"). It presents the Department's assessment of the potential health and environmental risk posed by the Site.

As described in Section 12 of the Regulations, DNREC-SIRB will provide notice to the public and an opportunity for the public to comment on the Proposed Plan. At the comment period's conclusion, DNREC-SIRB will review and consider all of the comments received and then issue a Final Plan of Remedial Action ("Final Plan"). The Final Plan will designate the selected remedy for the Site. The Proposed Plan, the comments received from the public, DNREC-SIRB's responses to those comments, and the Final Plan will constitute the Remedial Decision Record.

Section II presents a summary of the Site description, Site history and previous investigations of the Site. Section III provides a description of the Remedial Investigation results. Section IV presents a discussion of the Remedial Action Objectives. Section V presents the Proposed Plan of Remedial Action. Section VI discusses public participation requirements.

II. SITE DESCRIPTION AND HISTORY

Site Setting

The Site consists of three parcels of land (tax parcel nos. 21-014.00-499, 21-014.00-183 and 21-014.00-541) containing a total of approximately 7.67 acres located at Ninth and Washington Street in New Castle, Delaware. Washington Street borders the Site to the west, Ninth Street borders the Site to the south and Gray Street borders a portion of the property to the east (see

Figure 2). Two small streams join on the northern end of the Site and the resultant single stream crosses the Site from northwest to the southeast. The Site is currently a vacant lot. Surrounding land uses include primarily residential properties to the north, east and west. A City of New Castle water tower is present to the northeast of the Site, and the New Castle Steel Plant ("NCSP"), a former National Priority List ("NPL") site is southeast of the Site across Ninth Street.

For the purposes of remedial alternative evaluation, the Site was divided into three operable units during the RI/FS (see Figure 3). The Site is comprised of an easternmost parcel (0.9297 acres), tax parcel no. 21-014.00-499 designated as Operable Unit-I ("OU-I"), an adjacent parcel (5.9863 acres), tax parcel no. 21-014.00-183 designated as Operable Unit-II ("OU-II") and a southeastern parcel (0.7493 acres), tax parcel no. 21-014.00-541 designated as Operable Unit-III ("OU-III"). This Proposed Plan is limited to OU-II.

Site and Project History

Title transfer records and historic aerial photographs were reviewed to evaluate the history and previous uses of the Site. Records indicate the Site has been owned and/or operated as a steel foundry by the Deemer Steel Casting Company from the early 1900's until 1987. Sometime in the early 1990's, the buildings comprising the Deemer Steel Casting Company operation were demolished, and some large slab foundations remain on Site.

III. INVESTIGATION RESULTS

Results of Previous Investigations

Phase I Environmental Site Assessment (ESA)

WIK conducted a Phase I ESA on the Site in December 1990 (WIK, 1990). Based on the history of the Site, discussions with State and local agencies and the on-site inspection, WIK recommended that Phase II soil sampling be conducted to determine the concentrations of metals, polychlorinated biphenyls ("PCBs") and organic compounds in the soil, surface water, and groundwater.

Hydrogeologic Investigation for Fuel Oil Tank Removal

Resource Recovery Atlantic, Inc ("RRAI") conducted a Field Investigation Program for the Site in February 1996 (RRAI, 1996). The Investigation was conducted to characterize the subsurface conditions in the areas surrounding the single 6,000-gallon diesel underground storage tank ("UST"). The UST was located near the main gate to the Deemer Steel Site off of Ninth Street. Figure 2 shows the location of the former UST.

RRAI installed monitoring wells, excavated test pits, and advanced Geoprobe® borings in order to delineate the horizontal and vertical extent of hydrocarbon soil contamination. Analysis of samples indicated that low levels of total petroleum hydrocarbon ("TPH") concentrations were present in the initial groundwater samples. The report also concluded that some of the soil samples contained TPH concentrations above the DNREC-UST Branch ("DNREC-USTB") Moderate Risk Action Level of 1,000 ppm. The elevated concentrations were detected in three samples ranging in depth from 1.5 feet to 4 feet below ground surface (bgs). The report concluded that the UST and the associated piping were the most likely cause of the petroleum contamination.

Phase II Subsurface Investigation

In June 1996, RRAI performed additional Geoprobe® investigation activities to characterize the Site and performed soil excavation (RRAI, 1996). Soil was excavated in the three areas determined to be above the DNREC-UST Branch Moderate Risk Action Level during the first stage of the Field Investigation Program. Additional soil was excavated in areas with soil discoloration. Twenty soil samples were collected and analyzed for TPH. Two of the samples analyzed for TPH exceeded the DNREC-UST Branch Moderate Risk Action Level of 1,000 ppm. These samples, plus four additional samples, appear to have been collected at or above the water table. The remaining 14 samples appear to have been collected below the water table.

One post-excavation sample (B-18 PX) was analyzed for Priority Pollutants plus 40 Tentatively Identified Compounds (TICs). It appears that this sample was collected from the drum storage area where discolored soil was excavated. One post-excavation sample (PX) was analyzed for PCBs. It appears that this sample was collected from the former transformer area. The analytical results indicated that concentrations of benzo (a) pyrene, benzo (b)fluoranthene, and arsenic in sample B18 PX exceeded the Federal Risk Based Concentrations ("RBCs"). The analytical results indicated that both samples B-18 PX and PX exceeded the DNREC Residential Surface Soil Reporting Level for PCBs.

Subsurface Investigation

RRAI performed additional Site characterization in 1996 using a Geoprobe® (RRAI, 1996). Fourteen soil samples were obtained and eight of these samples were analyzed for TPH. Analytical results ranged from non-detectable to 166 (mg/kg). The analytical results were below the DNREC UST Branch Moderate Risk Action Level of 1,000 mg/kg. On November 4, 1996, RRAI issued a report summarizing the waste consolidation, tank cleaning, transformer removal and soil removal activities they performed at the Site (RRAI, 1996).

Drum consolidation and disposal activities were conducted by RRAI technicians. The PCB capacitors and the waste PCB drums were also classified and packaged during Site activities. On February 14, 1995, waste paint, caustic solutions and non-hazardous solids were shipped to Remtech Environmental Group in Lewisberry, PA. Eight drums of waste paint related materials were rejected by the disposal facility because of suspected PCBs. The drums were resampled and classified. The PCB-contaminated drums were shipped to Laidlaw Environmental in Laurel, MD. and the non-PCB drums were shipped to Chem Met Services in Wyandotte, MI. On August 4, 1995, the PCB capacitors were shipped in two drums to S.D. Myers, Inc. in Tallamadge, OH.

In April 1995, the two 500 gallon USTs and one 6,000 gallon UST were emptied and cleaned. On July 1, 1996, RRAI sampled six transformers. Samples of the oil were collected from the top and bottom of the transformers. The report indicated that all of the PCB results were below 50 ppm and that all of the transformers were shipped to G & S Technologies Division in Kearny, New Jersey. Once the transformers were removed, the concrete pad was cleaned and sampled. Contaminated soil was removed from those areas that had TPH concentrations above the DNREC-USTB Moderate Risk Action Level and also from areas where the soil was discolored. This soil was placed in a roll-off and taken to Eldredge Inc. in Chestertown, MD for recycling.

Summary of FE

In July 1997, WIK conducted a Facility Evaluation ("FE") to evaluate the nature and extent of soil contamination on the Deemer Steel Site (WIK, 1999). At the time of the FE, the Site was divided into Parcel A (west of the stream) and Parcel B (east of the stream) (see Figure 2). These parcel boundaries do not correspond to the actual tax parcel boundaries. The FE investigation included the excavation of 21 test pits across the site (see Figure 2). A total of 35 surface and subsurface soil samples were collected from the test pits. The soil samples were field screened using DNREC's mobile laboratory for carcinogenic polynuclear aromatic hydrocarbons ("cPAHs"), pesticides, PCBs, and Target Analyte List ("TAL") metals. Based on the field screening results, selected samples (25%) were analyzed using HSCA protocols at Envirotech Research, Inc. The samples were analyzed quantitatively for Semi-Volatile Organic Compounds ("SVOCs") Target Compound List ("TCL") pesticides, PCBs, cyanide, and TAL metals or RCRA metals.

Based on the data collected, the primary contaminants of concern on Parcel A were PAHs in both the surface and subsurface soil and arsenic in the subsurface soil. The primary contaminants of concern in Parcel B were PAHs and manganese in the surface soil (0 to 1 foot depth) and there were no contaminants of concern in the subsurface soil. Visible petroleum product floating on the surface of the groundwater was observed in test pit TP15 and a petroleum sheen was observed on the groundwater in test pits TP18, TP19, and TP21, located in the southeastern corner of Parcel A. It appears that this is a remnant of the petroleum contamination investigated in 1996.

Due to the presence of product on the groundwater table in the southeastern section of Parcel A, WIK recommended that additional characterization be undertaken to fully assess the extent of contamination.

Summary of RI/FS

The RI/FS was completed to address the remaining data needed for the Site including delineation of the petroleum hydrocarbon impacted area and obtaining groundwater quality data. On December 6, 1999, WIK excavated five trenches, consisting of 22 test pits, and 10 additional test pits in the southeastern corner of Parcel A on the Site (See Figure 4). Test pit locations were concentrated in the previously identified area of contamination along Ninth Street. All test pits were excavated to the water table, a depth of approximately three feet bgs. A total of twelve soil samples were screened for the following compounds:

- Extractable Petroleum Hydrocarbons ("EPH")
- Volatile Petroleum Hydrocarbons ("VPH")
- Polynuclear Aromatic Hydrocarbons ("PAHs")
- PCBs

Based on the screening results, samples were selected for VPH and EPH analysis. The EPH range of analytical parameters includes C_9-C_{18} Aliphatic Hydrocarbons, C_{19}-C_{36} Aliphatic Hydrocarbons, C_{11}-C_{22} Aromatic Hydrocarbons, and PAHs. The VPH range of analytical parameters includes C_5-C_8 Aliphatic Hydrocarbons, C_9-C_{12} Aliphatic Hydrocarbons, C_9-C_{10} Aromatic Hydrocarbons, benzene, toluene, ethylbenzene, xylenes, naphthalene, and methyl tert butyl ether ("MTBE").

The screening and analytical results were first compared to DNREC-SIRB Uniform Risk Based Remediation Standards ("URS") in a non-critical water resource area.

The screening results indicated that detectable concentrations of EPH compounds were found in five of the twelve soil samples (TP01-S001, TP01-S002, TP02-S001, TP11-S001, and TP12-S001). Four of the samples (TP01-S001, TP01-S002, TP02-S001, and TP12-S001) contained elevated concentrations of C_9-C_{18} Aliphatic Hydrocarbons, which are similar to diesel range organics. The concentrations detected range from 1,300 mg/kg to 29,000 mg/kg. All four samples exceeded the C_9-C_{18} Aliphatic Hydrocarbons unrestricted use URS of 1,000 mg/kg and three of the samples exceeded the restricted use URS of 2,500 mg/kg. TP11-S001 contained 130 mg/kg of C_{19}-C_{36}, Aliphatic Hydrocarbons, which are similar to heavy range organics. This concentration is below the URS unrestricted use concentration of 2,500 mg/kg for C_{18}-C_{36} Aliphatic Hydrocarbons. EPH compounds, which contained detectable concentrations of PAHs, were found in samples TP01-S001, TP01-S002, TP02-S001, TP03-S001, TP07-S001, TP09-S001, and TP11-S001. The screening results indicated that VPH compounds were not detected in any of the soil samples. All of the soil samples collected were screened for PCBs using Omichron Immunoassay techniques, and PCB's were not detected in any of the samples.

Soil Analytical Results

Concentrations of five of the PAHs exceeded the URS for unrestricted use. The PAHs are benzo(a)anthracene (1 of 6 samples), benzo(b)fluoranthene (2 of 6 samples), benzo(a)pyrene (4 of 6 samples), indeno(1,2,3-cd)pyrene (2 of 6 samples), and dibenz(a,h)anthracene (2 of 6 samples). Concentrations of the C_9-C_{18} Aliphatic Hydrocarbons and C_{11}-C_{22} Aromatic Hydrocarbons exceeded the URS unrestricted use criteria in 1 of the 6 samples.

These exceedances were then compared to the restricted use criteria. Benzo(a)pyrene, C_9-C_{18} Aliphatic Hydrocarbons and C_{11}-C_{22} Aromatic Hydrocarbons exceeded the URS restricted use criteria. The concentrations of benzo(a)pyrene in samples TP07-S001 and TP11-S001 of 1.4 mg/kg and 2.3 mg/kg, respectively, slightly exceed the URS restricted use criteria of 0.8 mg/kg. The concentration of C_9-C_{18} Aliphatic Hydrocarbons in sample TP12-S001 of 4,400 mg/kg exceeds the URS restricted use criteria of 2,500 mg/kg. The concentration of C_{11}-C_{22} Aromatic Hydrocarbons in sample TP12-S001 of 3,800 mg/kg exceeds the URS restricted use criteria of 2,000 mg/kg. Four of the soil samples were analyzed for VPH and the concentrations were all either below laboratory detection limits or below the URS restricted use criteria for all VPH compounds analyzed.

Groundwater Analytical Results

A total of four groundwater samples were collected from monitoring wells MW-1, MW-2, MW-3, and MW-4 (see Figure 5). The groundwater samples were analyzed for full TCL and TAL parameters according to HSCA protocols. The analytical results for each sample were compared with the Delaware HSCA URS criteria for the protection of Human Health (groundwater regulatory criteria) as follows:

- Volatile Organic Compounds ("VOC's") in Groundwater: All four groundwater samples were analyzed for VOC's. VOC's were not detected above the laboratory detection limits in any of the samples. Various tentatively identified compounds ("TICs") were detected in sample MW4-W001 at low concentrations.

- Semi-volatile Organic Compounds in Groundwater: All four groundwater samples were analyzed for SVOCs. Bis(2-Ethylhexyl)phthalate and pyrene were the only SVOCs detected above laboratory detection limits. Bis(2-Ethylhexyl)phthalate was detected in all four samples. The concentrations detected were all below the DNREC URS of 6 μg/L. Bis(2-Ethylhexyl)phthalate is a common laboratory contaminant and was also detected in the laboratory blank. This indicates that the contaminant is most likely a laboratory contaminant and not indicative of Site conditions. Pyrene was detected in MW-4 at a concentration of 1 μg/L, which is below the DNREC URS of 18 μg/L. Various TICs were also detected in the sample from MW-4 at low concentrations.
- Pesticides in Groundwater: All four groundwater samples were analyzed for pesticides. No pesticides were detected above the laboratory detection limits.
- PCB Compounds in Groundwater: All four groundwater samples were analyzed for PCBs. No PCBs were detected above the laboratory detection limits.
- TAL Metals and Cyanide in Groundwater: All four groundwater samples were analyzed for metals and cyanide. Concentrations of six metals exceeded the respective URS concentrations in groundwater. The metals are aluminum (3 of 4 samples), chromium (1 of 4 samples), iron (4 of 4 samples), lead (1 of 4 samples), manganese (4 of 4 samples), and vanadium (1 of 4 samples).

The aluminum, iron and manganese HSCA URS for groundwater are based on the EPA Secondary Maximum Contaminant Levels ("SMCLs") (EPA, 1996), which are aesthetic criteria rather than risk-based concentrations. Under the EPA Drinking Water Standards, the SMCLs are unenforceable federal guidelines regarding taste, odor, color and other non-aesthetic effects of drinking water. Lead was detected in MW-1 at a concentration of 20 μg/L, which is slightly above the URS of 15 μg/L. The elevated lead concentration may be a result of underground lead pipes that supplied water to the former office of the Deemer Steel facility. No other on-site sources for lead were identified. Chromium was detected in MW-1 at a concentration of 20.2 μg/L, which is slightly above the URS of 11 μg/L. Vanadium was detected in MW-1 at a concentration of 29.8 μg/L, which is slightly above the URS of 26 μg/L.

A cumulative risk assessment was performed to evaluate the cumulative risk associated with the exposure to soil and ingestion of groundwater on the Site. The calculations were conducted using the DNREC Site-Specific Calculator for Multiple Analytes (DNREC May 2000 version) assuming a current and future restricted and unrestricted use scenario. The cumulative risks were calculated using the arithmetic mean of the concentration in a certain media instead of the typical 95% of the upper confidence level ("UCL") of the mean because the total number of the data points was too small. Even though there was sufficient soil SVOC data, the arithmetic mean was used instead of 95% UCL to derive the calculated risks, since the value was more conservative.

Soil - Unrestricted Use

The assessment indicates that the unrestricted use cumulative risks, carcinogenic and non-carcinogenic, are $1.14X10^{-4}$ and equal to a Hazard Index of 1.04, respectively. Two compounds, arsenic and benzo(a)pyrene, have individual risks that exceed the DNREC-SIRB guideline of $1X10^{-5}$ and hazard index of 1. These risks are above the DNREC guidelines for unrestricted use; therefore, remediation is required prior to development for residential purposes.

Soil - Restricted Use

The assessment indicates that the restricted use cumulative risks, carcinogenic and non-carcinogenic, are $1.27X10^{-5}$ and equal to a Hazard Index of 0.04, respectively. There are no individual compounds that exceed the DNREC guidelines but the calculations show that the cumulative cancer risks is driven by arsenic and benzo(a)pyrene. The non-cancer risks are within DNREC guidelines of 1 for restricted use. Based on the calculated cumulative risk, the Site soil may pose an unacceptable risk to human health and the environment under commercial use unless some remediation is performed.

Because the EPA has not published a consensus chronic reference dose ("RfD") or cancer slope factor ("CSF") for C_9-C_{18} aliphatics and C_{11}-C_{22} aromatics, it is not possible to calculate risk-based concentrations for these petroleum constituents and, therefore, they are not included in the DNREC calculator.

Therefore, based on the risk assessment, the soil does pose an unacceptable risk to human health and the environment for unrestricted and restricted use.

Groundwater

The assessment indicates that the cumulative carcinogenic risk associated with groundwater is $6.83X10^{-5}$, which exceeds DNREC's risk guideline of $1X10^{-5}$ (DNREC, 1996). This cumulative risk is driven by the individual risk associated with arsenic. However, the maximum concentration detected in the groundwater was 6.7μg/L and the mean is 3.03μg/L, below the arsenic drinking water MCL standard of 50μg/L.

The assessment indicates that the cumulative non-cancer Hazard Index is 1.75 in groundwater, which is above the DNREC guideline of 1. However, 60 percent of the risk associated with drinking the groundwater is attributable to iron, a naturally occurring compound in groundwater in the New Castle area (Woodruff, 1970; Johnston, 1973).

Based on this information, the arsenic and iron concentrations in the groundwater, regardless of their source, do not pose an unacceptable risk to human health.

Surface Water

The primary ecological receptor for any compounds migrating from the Site would be aquatic organisms in either the stream or the downstream receiving wetland. The potential pathways are overland flow, primarily of sediment, and groundwater discharge to surface water. Surface water runoff is a potential pathway for sediment transport. However, the only compounds that were elevated in the sediment (cadmium, copper and lead) were not elevated in the surface soil and all of the proposed remedies address this pathway via capping and vegetation. Groundwater discharge of iron to the drainage ditch may be a potential concern. However, the iron in the water table hydrologic zone is probably naturally elevated and this discharge would represent a natural condition. Additionally, based on the EPA surface water results at the adjacent marsh, the receiving water body already has elevated concentrations of iron in areas that could not have been impacted by the Deemer Steel Site (USEPA Region III, 1995). The adjacent landfill area ("NCSP") is the probable source of iron in the marsh surface water. In summary, the potential

risk to ecological receptors from the Site is small and redevelopment of the Site should result in a reduction of any impacts.

The area under OU-I requires a different type of remedy than OU-II since it is proposed for a residential use. One surface sample, TP05-S001 (0-1 feet bgs) and one subsurface sample, TP05-S002 (4.5-5.5 feet bgs) were collected from test pit TP05 at the OU-I area during the FE investigation. The soil samples were field screened using DNREC's mobile laboratory for "cPAHs", pesticides, PCBs, and TAL metals. The surface soil (TP05-S001) concentrations of arsenic, iron and manganese detected at 8.36 mg/kg, 105,891 mg/kg and 3,599 mg/kg exceeded the unrestricted URS concentrations of 0.4 mg/kg, 2,300 mg/kg and 160 mg/kg, respectively. The subsurface soil (tp05-s002) concentrations of arsenic, iron, manganese and vanadium detected at 2.88 mg/kg, 17,500 mg/kg 1,202 mg/kg and 66 mg/kg, respectively also exceeded the unrestricted URS concentrations. PCBs, DDT and cPAHs concentrations were not detected in the soil samples. The subsurface soil sample was submitted for confirmatory analysis and arsenic, iron and manganese were detected at 4.8 mg/kg, 15,800 mg/kg and 1,690J mg/kg (defined as estimated value), which also exceeded unrestricted URS concentrations. The elevated metal concentration present in soil samples appears to be from the vitreous and metallic slag that is present across all three operable units, a by-product of the foundry operations.

Therefore, the proposed remedy at OU-I is to remove top 2 feet of impacted soil from the entire area by excavating and relocating to the commercial portion of OU-II where the soil will be capped and incorporated as part of its remedy. During the excavation and relocation activities the top two feet of impacted soils will be sampled by DNREC to ensure that they do not exceed a cumulative risk level of $1x10^{-4}$ prior to allowing them to be relocated to OU-II. If soils exceed a cumulative risk level of $1x10^{-4}$ then other management options will be considered. Following excavation, confirmatory samples will be collected in accordance with HSCA guidelines to ensure that the remaining soils at OU-I are below the unrestricted criteria in non-critical water resource area to be consistent with the proposed remedy for that part of the Site.

IV. REMEDIAL ACTION OBJECTIVES

According to Section 8.4 (1) of the Regulations, site-specific Remedial Action Objectives ("RAO's") must be established for all Plans of Remedial Action. The remedial action will be evaluated for soil only based on the following factors:

- The Site is currently zoned as multi-family residential land and is vacant.
- The future Site use is expected to be commercial and covered by buildings, vegetation or pavement.
- Surrounding land uses are mixed, including commercial and residential.
- Soil at the Site has been impacted by various chemical constituents. Based on the nature and extent of the contaminants, arsenic, petroleum hydrocarbons, and PAHs are the primary contaminants of concern.
- The primary exposure pathways are inhalation, direct contact with and incidental ingestion of impacted soil, and direct contact or ingestion of impacted surface water.
- Compound-specific RAO's are based on a $1X10^{-5}$ cumulative risk factor or a Hazard Index of 1, as appropriate.

Qualitative objectives describe, in general terms, what the ultimate result of the Remedial Action at the Site should be. Considering that OU-II will be developed for commercial use, the following qualitative objectives were developed:

- Control potential human contact (dermal and ingestion) with contaminated soil.
- Control potential human contact (dermal and ingestion) with contaminated surface water (on-site stream).
- Minimize soil contaminant migration to the surface water (on-site stream).

Quantitative objectives define specific levels of Remedial Action to achieve protection of human health and the environment. Based on the qualitative objectives, the following quantitative objectives were developed for OU-II:

SOIL REMEDIATION

- Prevent contact with soil having a benzo(a)pyrene concentration equal to or greater than 4 mg/kg.
- Prevent contact with soil having an arsenic concentration equal to or greater than 20 mg/kg.
- Allow for commercial/restricted use development at the OU-II.

The following three remedial alternatives were evaluated for the impacted soils at OU-II, which is to be developed commercially:

1. Complete removal and off-site disposal of the impacted soil
2. In-situ capping of impacted soil
3. No further action

Alternative 1: Off-site Disposal: Under this alternative, the impacted soil would be excavated and disposed off-site. Approximately 17,000 cubic yards of contaminated soil would be transported through the City of New Castle for off-site disposal and an equal amount of clean fill would be transported back to the Site.

Alternative 2: In-situ Capping: Under this alternative, the impacted on-site soil would be capped in place. The top 2 feet of impacted soils from OU-I area above the unrestricted criteria will be excavated and relocated to the commercial portion of OU-II provided they do not exceed cumulatively the $1X10^{-4}$ risk level, where the soil will be incorporated as part of its remedy. All of the impacted soil would be capped with paving and/or a geotextile material or an approved barrier, topsoil and a protective vegetative cover as part of the Site improvements. Soil barrier(s) would require some on-going maintenance and will be addressed in an Operations & Maintenance Plan ("O&M Plan"). A deed restriction would stipulate that any disturbance of these capped areas would require prior DNREC approval.

- Alternative 3: No Further Action: The no further action alternative would leave the Site in its current condition. The contaminated soil would be left in its present location and no remedial action would be conducted at the Site. This alternative would preclude construction of the planned Site improvements.

The details of each soil remedial alternative are conveyed in WIK's RI/FS report dated March 2001 for the Site.

V. PROPOSED PLAN OF REMEDIAL ACTION

As stated in Section III of this Proposed Plan of Remedial Action, the contamination at the Site appears to be in the soil and ground water. In order to meet the RAO's, and based upon the information and results of the investigation performed at OU-II, DNREC-SIRB's Proposed Plan of Remedial Action for the Site is Alternative 2 and should include the following:

1. In-situ capping of contaminated soil with paving and/or a geotextile material or an approved barrier, including, but not limited to, topsoil and vegetative cover during the design stage. The top 2 feet of impacted soils from OU-I area that are above the unrestricted criteria but below a cumulative $1x10^{-4}$ cancer risk level, will be excavated and relocated to the commercial portion of OU-II where the soil will be incorporated as part of the remedy and capped by the final footprint of the building or pavement.

2. Prepare and implement an Operation and Maintenance Plan to maintain the integrity of the soil barrier(s).

3. The placement of an institutional control (i.e., deed restriction) which (a) will restrict the use of the Site to commercial and industrial uses only; (b) prohibit the installation of wells or the use of groundwater on the Site without the prior written approval of DNREC-SIRB; (c) require written approval from DNREC-SIRB prior to any soil disturbing activities under the paved or vegetative cover in the areas of concern identified on a property map; and (d) require written approval from DNREC-SIRB prior to the repair, renovation or demolition of any building used to cap contaminated soils, or any other activity that may disturb contamination under the foot-print of the building or surrounding pavement.

4. This Proposed Plan shall not interfere with the future proposed Remedial Actions for the adjacent parcels OU-I and OU-III; and

5. A Groundwater Management Zone will be placed on the Site to protect the public health, welfare and the environment.

VI. PUBLIC PARTICIPATION

The Department actively solicits public comments or suggestions on the Proposed Plan of Remedial Action and welcomes opportunities to answer questions. Please direct written comments to:

DNREC Site Investigation and Restoration Branch
391 Lukens Drive
New Castle, Delaware 19720
Attention: Mandeep Talwar

The comment period begins July 19, 2001, and ends at the close of business (4:30 p.m.) August 8, 2001 and if so requested, a public meeting will be held on the Proposed Plan. The meeting time and place will be announced if said meeting is requested.

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Figures from Remedial Investigation Report

Prepared by WIK Associates
Revised March 2001

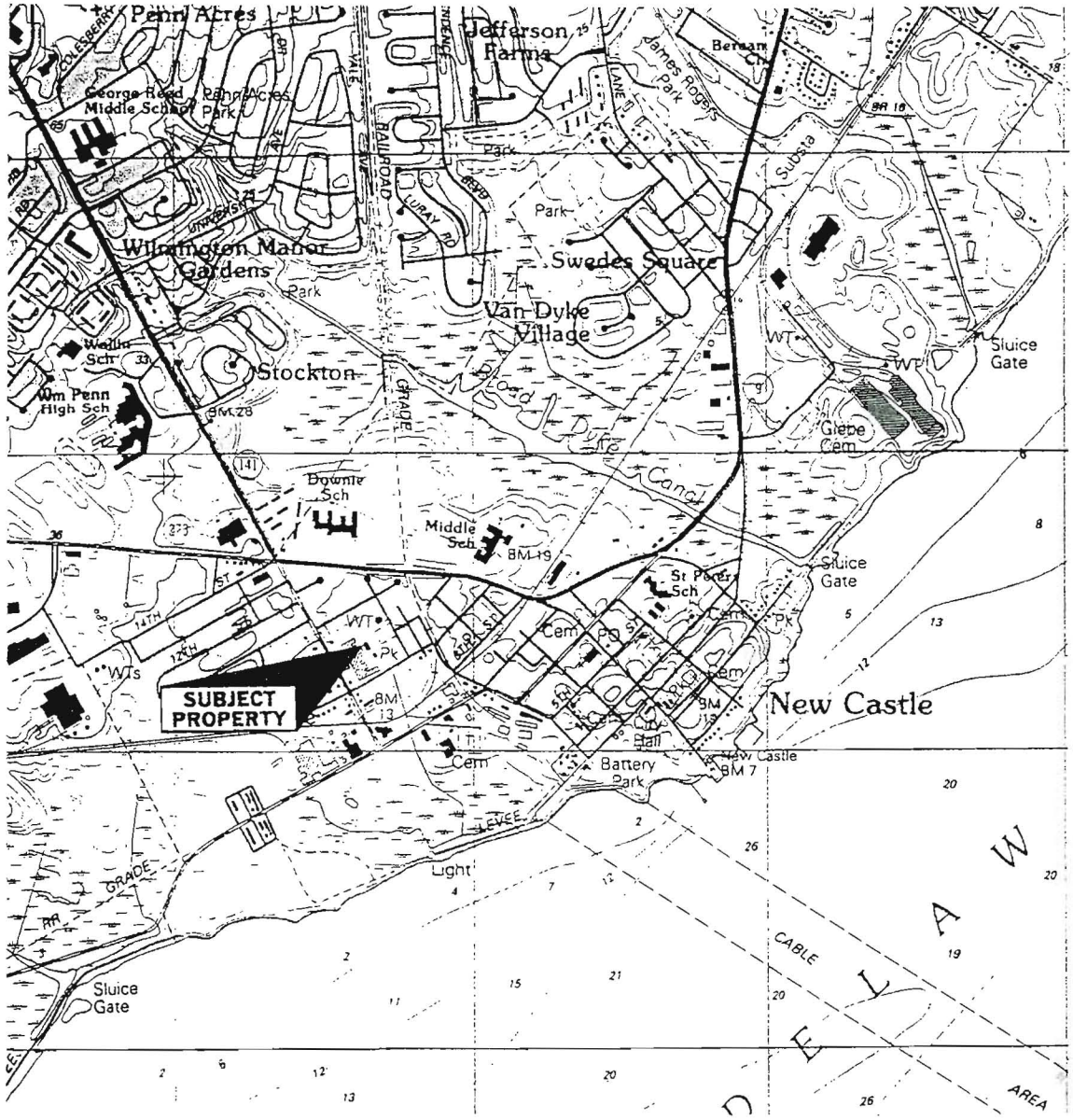


Figure 1

Site Location/Topographic Map

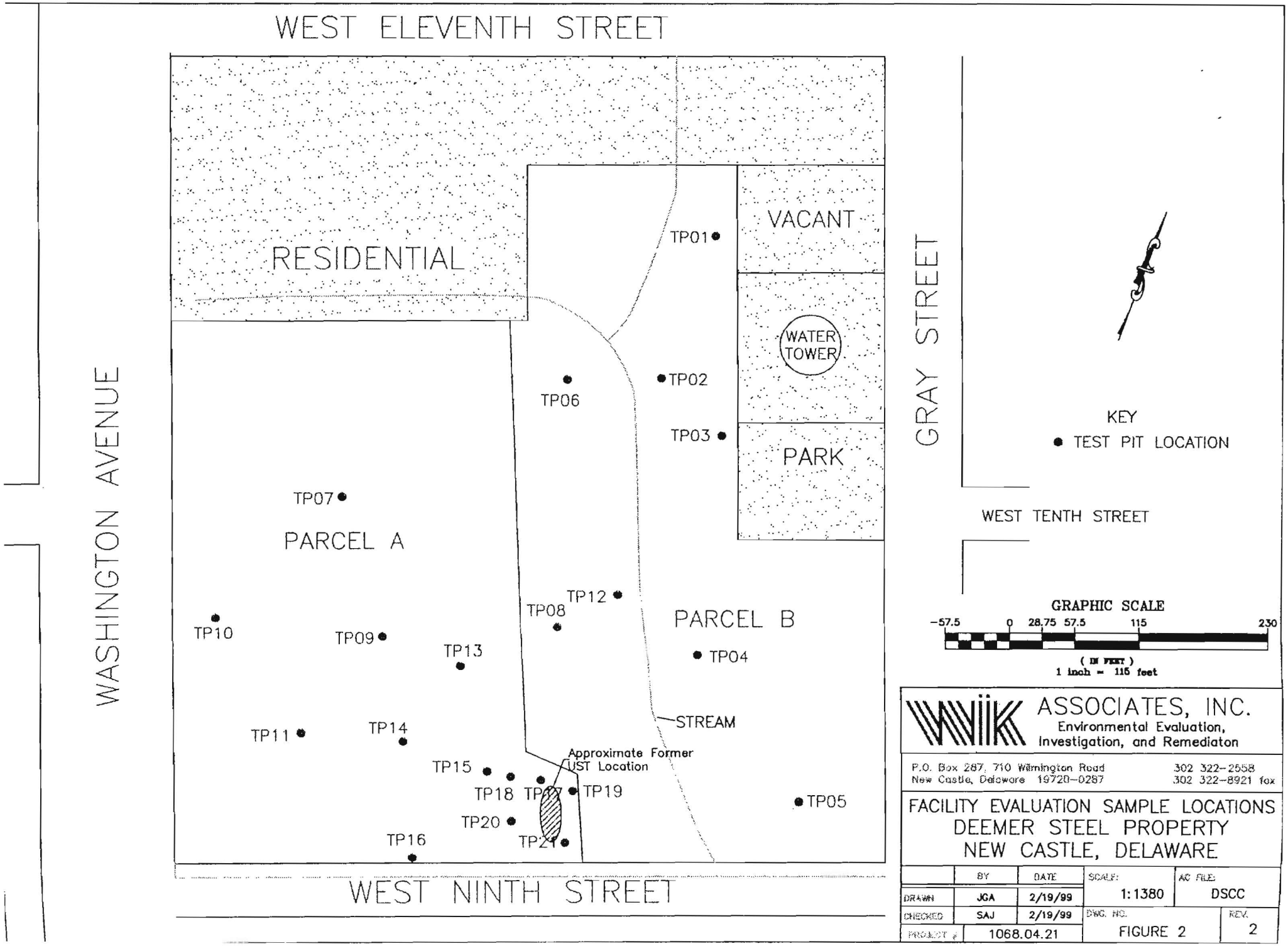
Wilmington South Quadrangle: 7.5 minute series

Map Date: 1989 Map edited 1993

Deemer Steel Casting Company

New Castle, Delaware

File: 1068.04.21



WIK ASSOCIATES, INC.
Environmental Evaluation, Investigation, and Remediaton
P.O. Box 287, 710 Wilmington Road
New Castle, Delaware 19720-0287
302 322-2558
302 322-8921 fax

FACILITY EVALUATION SAMPLE LOCATIONS
DEEMER STEEL PROPERTY
NEW CASTLE, DELAWARE

	BY	DATE	SCALE:	AC FILE:
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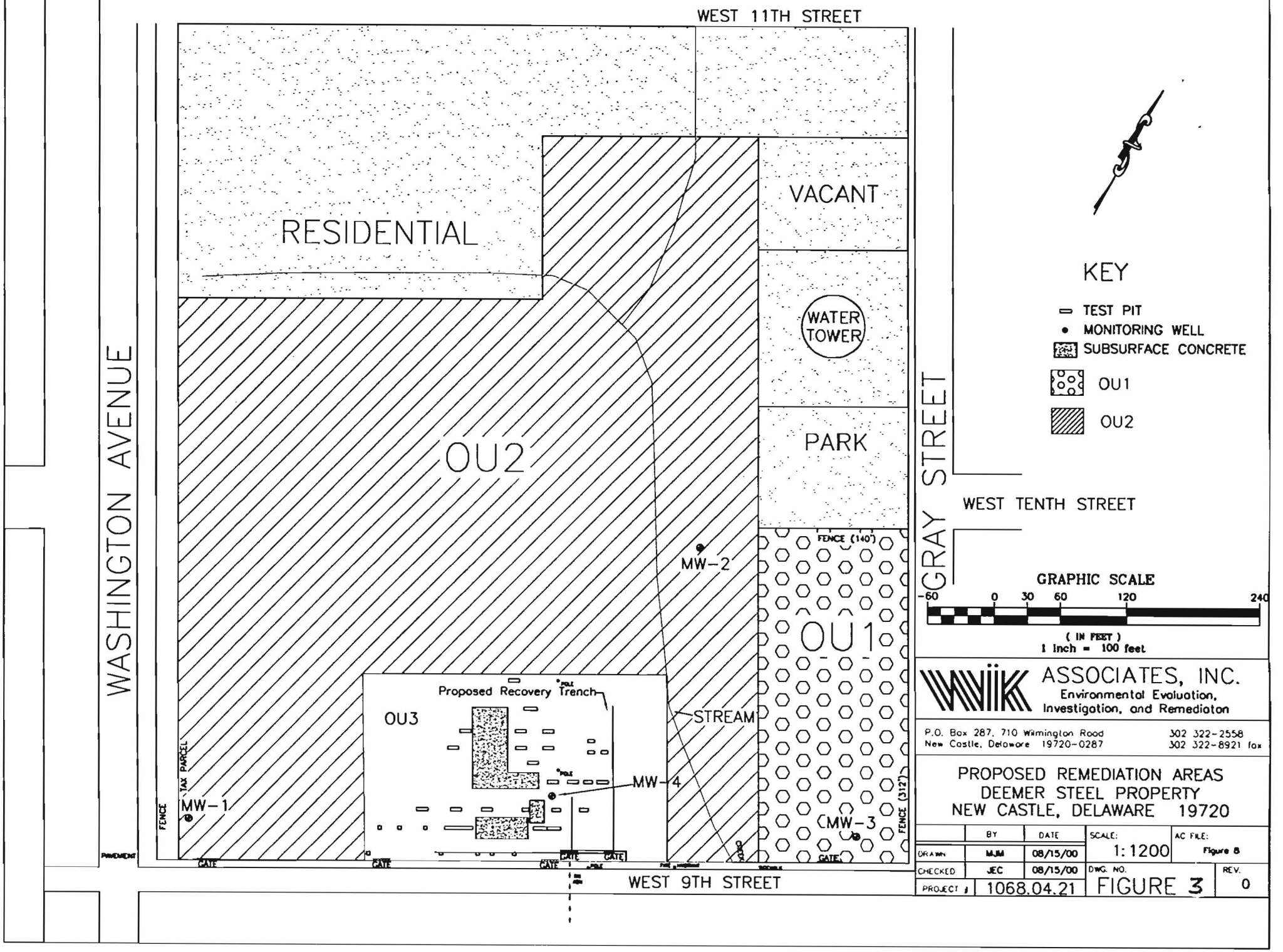
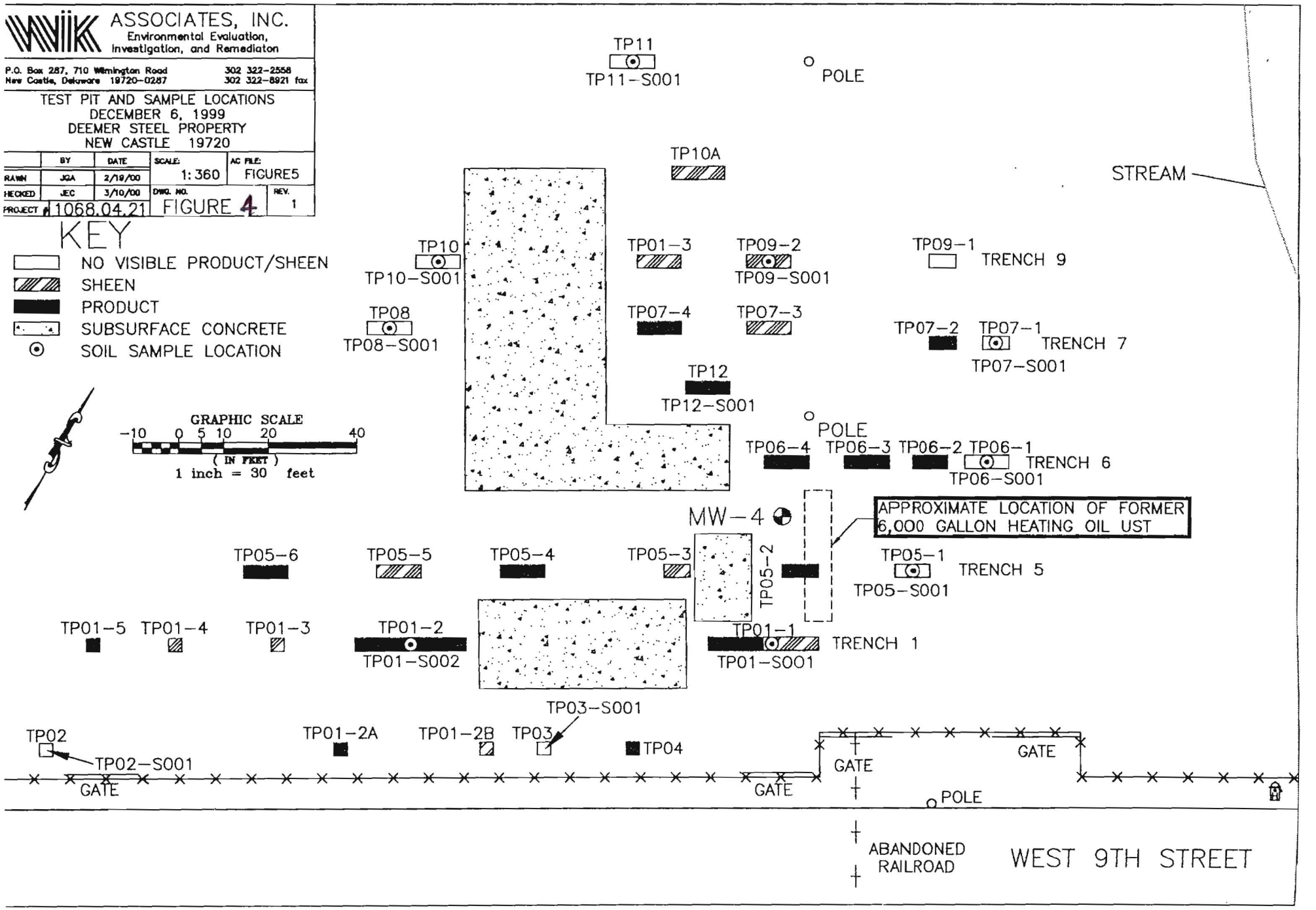


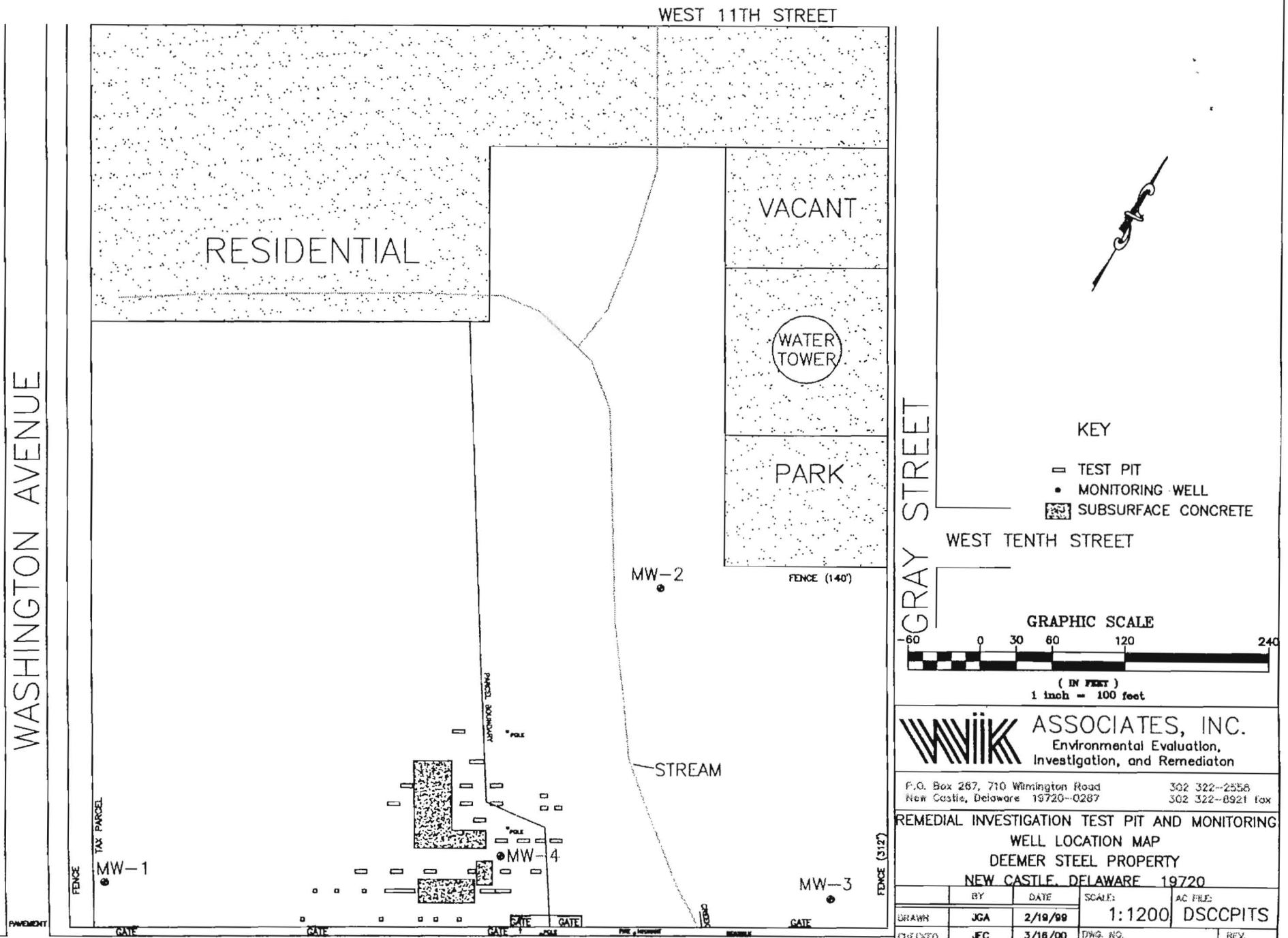
WIK ASSOCIATES, INC.
Environmental Evaluation, Investigation, and Remediation

P.O. Box 287, 710 Wilmington Road
New Castle, Delaware 19720-0287
302 322-2558
302 322-8921 fax

PROPOSED REMEDIATION AREAS
DEEMER STEEL PROPERTY
NEW CASTLE, DELAWARE 19720

	BY	DATE	SCALE:	AC FILE:
DRAWN	MJM	08/15/00	1:1200	Figure 8
CHECKED	JEC	08/15/00	DWG. NO.	REV.
PROJECT #	1068.04.21		FIGURE 3	0


WIK ASSOCIATES, INC.
Environmental Evaluation, Investigation, and Remediaton
P.O. Box 287, 710 Wilmington Road
New Castle, Delaware 19720-0287
302 322-2558
302 322-8921 fax
TEST PIT AND SAMPLE LOCATIONS
DECEMBER 6, 1999
DEEMER STEEL PROPERTY
NEW CASTLE 19720
BY JGA JEC
DATE 2/19/00 3/10/00
SCALE: 1:360
AC FILE: FIGURE5
DWG. NO. FIGURE 4
REV. 1
PROJECT # 1068.04.21
KEY
NO VISIBLE PRODUCT/SHEEN
SHEEN
PRODUCT
SUBSURFACE CONCRETE
SOIL SAMPLE LOCATION
GRAPHIC SCALE
-10 0 5 10 20 40
(IN FEET)
1 inch = 30 feet
TP11
TP11-S001
POLE
TP10A
STREAM
TP10
TP10-S001
TP01-3
TP09-2
TP09-S001
TP09-1
TRENCH 9
TP08
TP08-S001
TP07-4
TP07-3
TP07-2
TP07-1
TRENCH 7
TP07-S001
TP12
TP12-S001
POLE
TP06-4
TP06-3
TP06-2
TP06-1
TRENCH 6
TP06-S001
MW-4
APPROXIMATE LOCATION OF FORMER 6,000 GALLON HEATING OIL UST
TP05-6
TP05-5
TP05-4
TP05-3
TP05-2
TP05-1
TRENCH 5
TP05-S001
TP01-5
TP01-4
TP01-3
TP01-2
TP01-S002
TP01-1
TRENCH 1
TP01-S001
TP03-S001
TP02
TP02-S001
TP01-2A
TP01-2B
TP03
TP04
GATE
GATE
GATE
GATE
POLE
ABANDONED RAILROAD
WEST 9TH STREET



WIK ASSOCIATES, INC.
Environmental Evaluation, Investigation, and Remediaton
P.O. Box 267, 710 Wilmington Road
New Castle, Delaware 19720-0267
302 322-2558
302 322-8921 fax

REMEDIAL INVESTIGATION TEST PIT AND MONITORING WELL LOCATION MAP
DEEMER STEEL PROPERTY
NEW CASTLE, DELAWARE 19720

	BY	DATE	SCALE:	AC FILE:
DRAWN	JGA	2/19/99	1:1200	DSCCPITS
CHECKED	JEC	3/16/00	DWG. NO.	REV.
PROJECT #	1068.04.21		FIGURE 5	2