May 1995

SITE INVESTIGATION REPORT
INDIANA VOLUNTARY REMEDIATION PROGRAM

ALLIED PRODUCTS CORPORATION STAMPING FACILITY
SOUTH BEND, INDIANA

Project No. 8708

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1.0 INTRODUCTION

This section presents background information pertinent to the site activities performed at the Allied Products Corporation (Allied) manufacturing facility located in South Bend, Indiana. These activities were performed during the period of June 1989 to May 1995. This section is organized as follows:

- Report Organization (Section 1.1); and
- Site Background (Section 1.2).

Allied retained Advanced Pollution Technologists, Limited (APT) to perform a site investigation regarding potential constituent releases associated with seventeen underground storage tank (UST) systems. The investigation by APT, performed during the period of December 1993 to May 1995, was preceded by the closure of thirteen USTs. These closures were performed by Petroleum Equipment Inc. (PEI) during June 1989 to October 1991. The remaining four USTs were removed by APT in March 1994. This document summarizes the scope of work and the results associated with the site investigation performed by APT.

1.1 REPORT ORGANIZATION

This report is organized as follows:

- Introduction (Section 1.0);
- Site Characterization (Section 2.0); and
- Conclusions (Section 3.0).

There are also thirteen tables, twenty-one figures, and three appendices associated with this report.

1.2 SITE LOCATION AND HISTORY

This section presents information regarding the facility and the site history.

1.2.1 Site Location

The Allied South Bend Stamping facility is located at 601 West Broadway Street in South Bend, Indiana (Figure 1). The facility is part of the Studebaker corridor, a concentrated area of manufacturing and former manufacturing facilities, located about 1 mile southwest of the Central Business District of South Bend. The facility property boundaries abut Franklin Street to the east and the Conrail Railroad to the south (Figure 1). The northern boundary is shared with South Bend Lathe and western boundary is shared with Underground Pipe and Valve. The properties east of Franklin Street consist of undeveloped (vacant) lots. A residential area is located approximately 1/8-mile south of the facility.

Allied Products is the current facility owner. The facility manufactures automotive parts. Automotive body parts such as bumpers, fenders, doors, etc. are manufactured using cold rolled steel, which is cut to size and stamped to shape using large presses. The facility consists of three

buildings, the largest of which is the east building with approximately 444,000 square feet under roof. The west building has approximately 231,000 square feet under roof. The third and northernmost building has approximately 122,000 square feet under roof. The buildings are Type VI fire protection steel and concrete construction. The site layout is presented in Figure 2.

Climatologically, the facility is located in the temperate zone. Maximum summer temperatures are typically in the 90 to 95° F range and minimum winter temperatures are in the -15 to -20° F range. The South Bend, Indiana area receives approximately 38 inches of precipitation annually (source: Water Resource Availability in the St. Joseph River Basin, Indiana).

The topography of the area surrounding the facility is gently rolling to flat with a general slope to the northeast toward the St. Joseph River. Surface runoff consists of sheetflow which either exits the facility property along the northeast property boundary or is collected by storm sewers and discharged to the City of South Bend combined storm and sanitary sewer system. The surface water body closest to the facility is the Saint Joseph River which is approximately one mile northeast of the facility.

The drinking water in the area is supplied by the City of South Bend and is derived from groundwater sources. The wells supplying the municipal system are screened between 90-200 feet below the ground surface. The location of the nearest South Bend water supply wellfield is approximately one mile southwest of the facility (Figure 3).

1.2.2 Site History

Allied retained PEI to close the seventeen underground storage tanks that were present at the South Bend facility. A tank farm consisting of ten USTs, located between the three buildings of the facility was excavated and closed during November and December 1990. The tank farm consisted of six 10,000-gallon tanks, one 8,000-gallon tank, and three 12,000-gallon tanks (Figure 4). Soil samples were collected during closure and tested for Total Petroleum Hydrocarbons (TPH). The analytical results indicated that no releases had occurred from this UST system. Groundwater samples were not collected because groundwater was not encountered during the tank closure. The tanks reportedly stored gasoline, kerosene, diesel and heating oil prior to their closures. However, the tanks may have been installed as early as the 1920s, in which case the tanks may have stored several constituents in their lifetime.

A 5,000-gallon UST which was reportedly used to store gasoline was located approximately midway along and outside the east wall of the west building (Figure 4). This UST was closed in June 1990. Soil samples were collected during closure and tested for TPH. The closure sample analytical results indicated that releases had occurred from this UST. Impacted soils were overexcavated and disposed. Groundwater samples were not collected because groundwater was not encountered during the tank closure.

A 20,000-gallon UST which reportedly stored heating oil prior to its closure was located at the northwest corner of the west building (Figure 4). In June 1991, the tank was closed by abandonment-in-place since a large electrical transformer was located over a portion of the tank. Soil samples were collected during closure and analyzed for TPH. The results of the analysis indicated the presence of petroleum hydrocarbons in two samples. One closure sample contained TPH at a concentration of 62 mg/kg and the second sample contained TPH at a concentration of 17

mg/kg. Groundwater samples were not collected because groundwater was not encountered during the tank closure.

In October 1991, a 10,000-gallon tank located north of the east building was closed by removal (Figure 4). The tank reportedly had stored mineral spirits (associated with painting operations) and kerosene prior to the time of closure. A strong petroleum odor was detected in the surrounding soil during excavation activities. A TPH concentration of 6,300 mg/kg was detected in a soil sample collected from the excavated soil stockpiled from the excavation. A soil sample was collected four feet below the UST and analyzed for TPH and VOCs. The analytical results indicated a TPH concentration of 31 mg/kg and a 1,2,4-Trimethylbenzene concentration of 1,052 ug/kg. Since groundwater was not encountered during the tank closure, groundwater samples were not collected. The relative age and quantity of the release could not be accurately determined due to the age of the tank and the lack of adequate inventory records. However, 2,264 cubic yards of impacted soil was required to be excavated before encountering the limits of the impact. This soil was bioremediated and returned to the excavation site after the concentrations of constituents were below detection limits.

The final UST system consisting of four 4,000-gallon tanks is located under the west wall of the west building. A preliminary assessment conducted by PEI, consisting of a single monitoring well installed near the tanks, indicated that releases to the groundwater had occurred, based on the detection of Tetrachloroethylene or Tetrachloroethene (PCE) in a single groundwater sample collected from this well and analyzed for volatile organic compounds. The apparent release was reported to IDEM by PEI and APT was retained by Allied to conduct a site assessment. These USTs were closed by APT in March 1994. Analysis of soil samples collected at the time of closure confirmed that PCE and TPH releases had occurred from this tank system. The summary of these closure soil sample analyses can be found in Table 1 through Table 3.

1.2.3 Site Documentation

A summary of the previous work performed at the site, described in Section 1.2.2 of this document, is found in the following reports:

- Underground Storage Tank Closure Report: Allied Products Tank Farm Facility (PEI, 1991).
- Underground Storage Tank Closure Report: Allied Products 20,000 UST (PEI, 1991).
- Underground Storage Tank Closure Report (PEI, 1991).

2.0 SITE CHARACTERIZATION

This section is organized as follows:

- Baseline Assessment (Section 2.1);
- Background Concentrations (Section 2.2);
- Sampling Methodology (Section 2.3);
- Sample Analysis (Section 2.4); and

- Site Investigation Results (Section 2.5).

The Boring Logs for soil borings and monitoring wells drilled by APT are located in Appendix A. The Chain-of-Custody records are included in Appendix B. The laboratory analytical reports for samples collected by APT are included in Appendix C.

2.1 BASELINE ASSESSMENT

Baseline ecological and hydrogeological assessments for this site are discussed below.

2.1.1 Baseline Ecological Assessment

The facility is located within the City of South Bend corporate limits in a highly industrialized and commercialized urban area. The surface topography is relatively flat and slightly sloping toward the northeast. Surface runoff in the area is collected by the City of South Bend combined storm and sanitary sewer system. The nearest surface water is the St. Joseph River which is located approximately one mile northeast of the facility. The groundwater flow is toward the northeast in the direction of the St. Joseph River. The constituents of concern have been detected only in subsurface soils and groundwater, and the extent of impact has been determined. Therefore, the potential threat to aquatic wildlife in the St. Joseph River is assessed to be non-existent.

There does not appear to be any potentially affected endangered species in the vicinity of the site. No evidence of stressed vegetation or wildlife has been observed at the site. There are no wetlands, riparian areas or other environmentally sensitive areas in the vicinity of the site.

There are limited opportunities for exposure to the constituents identified at the site. There are no large concentrations of wildlife in the immediate vicinity, and the closest residential area is approximately 1/8 mile south (upgradient) of the facility (Figure 1). The site is secured within a seven foot chain-link fence with a designated ingress point attended by security personnel. There is no opportunity for wildlife or the local human population (e.g., children or passers-by) to have access to the site and contact potentially impacted soils or groundwater. Impacted soils, where present, are not at the ground surface but are encountered in the subsurface beneath paved areas and buildings. Likewise, groundwater is encountered at depths greater than 20 feet below the ground surface and there are no groundwater surface discharge points (e.g., springs) in the area.

In summary, the potential for sensitive areas to be affected appears to be minimal.

2.1.2 Background Hydrogeological Assessment

A literature search was performed to provide a background understanding of the regional and local hydrogeology in order to properly guide assessment activities. Since the facility is located in St. Joseph County in northern Indiana the following publications are applicable and were reviewed:

- Professional Technical Staff for the Division of Water, Water Resource Availability in the St. Joseph River Basin, Indiana; Indiana Department of Natural Resources, 1987.

- Geologic Map of the 1° x 2° Fort Wayne Quadrangle, Indiana, Michigan, and Ohio, Showing Bedrock and Unconsolidated Deposits; Indiana Department of Natural Resources, 1972.

- South Bend - East and South Bend - West, Indiana 7.5-minute Topographic Quadrangle Maps; United States Geologic Survey (1973).

- St. Joseph County Potential Groundwater Contamination Sites; Michiana Area Council of Governments; August 1989.

Physiographically, the facility is located along the southern rim of the Michigan Basin and northeast of the Kankakee Arch, which separates the Illinois Basin from the Michigan Basin. The surface and near-surface geology is part of the Kankakee Lowland. It is characterized by fine-grained Holocene alluvium underlain by thick outwash sand and gravel which overlie lake muds. The unconsolidated surficial deposits are approximately a hundred feet thick and unconformably overlie the Ellsworth Shale, an eroded Devonian bedrock surface (Geologic Map of Indiana; Indiana Geological Survey). The Ellsworth Shale is a predominantly green marine shale with some dark brown/black layers occurring in the lower portions of the unit.

Literature sources concerning the hydrogeology of the area indicate that the facility is located in the St. Joseph Aquifer System. The St. Joseph Aquifer System is primarily composed of fine to medium sand with localized layers of coarse sand and gravel. The total aquifer system thickness ranges from 20 to 400 feet. (Indiana Department of Natural Resources Division of Water; Water Resource Availability in the St. Joseph River Basin, Indiana; 1987). Typically, groundwater is first encountered at depths of 15-20 feet below the ground surface. The regional groundwater flow within the St. Joseph Aquifer System is toward the northeast with a gradient of approximately 0.005 ft/ft, generally following the surface topographic expression (Water Resource Availability in the St. Joseph River Basin, 1987).

According to available reference materials, thin (3 to 5 feet) clay layers are interspersed within the aquifer and a moderately thick deposit of clay/till separates an upper sand and gravel aquifer from a lower more productive sand and gravel aquifer. Also according to available published reference materials, the shallow aquifer unit is unconfined and occurs within 15-20 feet of the surface. Therefore, it is highly susceptible to surface and near-surface sources of groundwater contamination. Reference material suggests that the deep aquifer unit is generally confined and occurs at depths greater than 100 feet below the ground surface.

The on-site investigation indicates that a single, unconfined, aquifer unit consisting of a massive sand unit underlies the facility, extending from the ground surface to a depth of approximately 76 feet below the ground surface. A thirty-seven foot thick interval consisting of interbedded till and sand/gravel units underlies the massive sand unit and extends downward to the bedrock surface, which occurs at a depth of 113 feet, the depth at which auger refusal occurred while drilling monitoring well MW-1D. Individual till and sand/gravel units within this interval are typically several feet thick (see Soil Boring Log for monitoring well MW-1D).

Several rounds of water elevation measurements collected during the site investigation indicate that the depth to groundwater in the unconfined aquifer underlying the site is approximately 25 feet

below ground surface. The expected seasonal fluctuation of groundwater in the site area is several inches based on groundwater elevation data collected during the course of a year. The local groundwater flow is toward the northeast with a gradient of approximately 0.003 ft/ft and an estimated velocity of 103.5 ft/year.

Groundwater from the St. Joseph Aquifer System is utilized as a potable water supply in the area. However, there are no private water supply wells in the vicinity; the City of South Bend provides a municipal water supply to all residential and commercial property in the city. The municipal water supply wells tap the aquifer at a minimum depth of 90 feet and the nearest municipal water supply wells are located upgradient of the site.

2.2 BACKGROUND CONCENTRATIONS

The constituents of concern (i.e., chlorinated compounds and refined petroleum hydrocarbons) do not occur naturally in the envoronment. Therefore, a background investigation was not performed. Any detected constituents are assumed to be the result of man-made operations.

2.3 SAMPLING METHODOLOGY

APT conducted a site investigation during the period of December 1993 to May 1995. The sampling locations, the media sampled, and the methods utilized are discussed in the following sections.

2.3.1 Sample Matrices

Soil and groundwater were the media investigated during the site investigation. The soil was sampled primarily at three depth intervals: at a depth of approximately eight feet below the ground surface as part of the UST closure sampling; at the water table approximately 21-25 feet below the ground surface; and from a depth interval between 38-42 feet below the ground surface. The latter depth interval contains a distinct (stained) layer of soil which was determined to be impacted by petroleum products.

The groundwater was sampled at the water table 21-25 feet below the ground surface and from a depth interval of approximately 40-45 feet below the ground surface. The monitoring well screens were five feet long and set four feet below the water table for the shallow wells and set at approximately 45 feet for the deep monitoring wells.

Surface water was not sampled because the nearest surface water is located approximately one mile northeast of the facility and it is beyond the extent of the impacted soil and groundwater.

The atmosphere was also not sampled since the opportunity for the constituents of concern to contact the atmosphere is essentially non-existent.

2.3.2 Sample Locations

The site investigation consisted of twenty-four shallow monitoring wells, seventeen deep monitoring wells, and nine soil borings. The shallow wells (identified by a "S" designation) are screened across the water table to identify constituents that would be present on or near the groundwater surface.

The deep wells (identified by a "D" designation) were screened at approximately 40-45 feet to evaluate potentially impacted groundwater resulting from the petroleum impacted soil layer identified in the soil samples at a depth of approximately 38-42 feet. The shallow and deep wells were drilled as well clusters so that the vertical groundwater gradient could be determined and the constituent concentration profiles could be evaluated. The installation of the monitoring wells included continuous split spoon sampling and hydrogeologic characterization of the subsurface deposits. The soil samples for laboratory analysis were typically collected at the water table and from a depth of 38-42 feet below the ground surface. The constituents of concern in groundwater were believed to be in the uppermost portions of the aquifer and at a depth corresponding to the stained interval, respectively. The locations of the monitoring wells and soil borings are presented in Figure 5.

Releases were initially determined to have occurred from the four 4,000-gallon underground storage tanks located under the west building (Figure 4). Therefore, the monitoring wells installed during the early phases of the investigation installed during the early phases of the site investigation (MW-1 through MW-9) are concentrated around these tanks and downgradient of the tanks toward the northeast portion of the facility (Figure 5). Monitoring well/well cluster locations MW-10, MW-11, MW-12, MW-13, MW-15 and MW-25 were installed downgradient of the four USTs during a subsequent phase of the investigation in order to define the extent of the soil and groundwater impact associated with the release and to characterize the local hydrogeologic conditions (Figure 5). The off-site monitoring well/well cluster locations (MW-16, MW-17, MW-18, MW-19, MW-20, United Limo MW-1, MW-3) were installed and sampled to determine the extent of impact off-site.

The soil and groundwater were also evaluated near the locations of the other closed underground storage tank systems at the facility in order to assess the possibility that releases might have occurred from these areas (Figure 5). Monitoring well cluster MW-23S/23D and soil borings TB-5 and TB-6 were installed to investigate the 10,000-gallon tank north of the east building. Soil borings TB-1, TB-2, TB-3, TB-4, TB-7, TB-8, TB-14 and monitoring well MW-24D were installed to ascertain whether or not releases have occurred from the ten UST tank farm located between the east building and the west building. Monitoring well cluster MW-11S/11D is located immediately downgradient of the former 20,000-gallon UST located northwest of the west building. Monitoring well cluster MW-26S/26D was installed downgradient of the former 5,000-gallon gasoline UST located along the eastern side of the west building.

Lastly, several monitoring wells were installed to assess whether any constituents were migrating onto the Allied property from off-site (upgradient or sidegradient) sources (Figure 5). Monitoring well MW-22 was installed at the southern (upgradient) property boundary to evaluate the groundwater quality entering the site. Likewise, monitoring wells MW-5S and MW-5D provide information about the groundwater entering the site from the western boundary. The three monitoring wells (MW-14, MW-21S, MW-21D) along the east boundary of the site provide sidegradient control.

2.3.3 Investigation Methods

All of the soil borings and monitoring wells were drilled using a mobile rig equipped with 4¼ inch inside diameter (ID) continuous flight hollow stem augers. Continuous undisturbed soil samples for geologic and chemical characterization were collected utilizing a two-foot long split-spoon sampler driven ahead of the auger bit in accordance with ASTM Standard Method D1586-84. All soil

borings were advanced until the desired depth was reached, based on either a predetermined depth or the results of field screening using a photoionization detector (PID). Geologic observations, as well as any other apparent physical characteristics (staining, odor) were recorded on boring logs. Each borehole was plugged with bentonite chips after sampling. The boring logs for APT soil borings are included in Appendix A.

Upon opening each two-foot split-spoon sampler, the recovered soil sample was screened at six-inch intervals for VOCs using a PID headspace method, and the observations recorded on the boring log in accordance with the Indiana Department of Environmental Management (IDEM) requirements. The soil sample was then geologically characterized by the site geologist. Representative soil samples were collected from various intervals within the soil borings based either on pre-determined sampling frequency or on the results of the PID head space analysis and analyzed for VOCs, SVOCs, and TPH.

Monitoring well installation was accomplished inside of the hollow stem auger chain. All monitoring wells were constructed of flush-threaded five- and ten-foot sections of Schedule 40 PVC with a five-foot long, 0.010-inch slotted screen. All monitoring wells were of the flush mount design to avoid impeding vehicular traffic and for aesthetic reasons. Monitoring well construction details are provided on the boring logs included in Appendix A.

The following procedure was used when installing monitoring wells:

- The borehole was advanced to the total desired depth using a hollow stem auger, with continuous two-foot long split-spoon sampling for chemical and geologic characterization. At most of the well cluster locations the deep well was drilled first with continuous sampling from the ground surface to the total depth. At those well locations where a deep well was installed subsequent to the installation of the shallow well, split-spoon sampling in the twinned, deep wells commenced at the interval corresponding to the total depth of the adjacent shallow well and continued to the total depth.

- A five-foot long, 0.010-inch slotted PVC screen and ten-foot long sections of flush-threaded PVC riser were installed in the wellbore. The screen in the shallow wells was placed to intersect static groundwater under a variety of climatic seasonal conditions. The screened interval in the deep wells extends from 40-45 feet below the ground surface.

- A sand pack was placed in the wellbore annular space extending from the bottom of the wellbore to two feet above the top of screen.

- The annular space extending from the top of the sand pack to approximately one foot below the ground surface was backfilled using bentonite chips.

- The remaining annular space was filled with cement from the bottom-up.

- The riser pipe was notched for surveying purposes and equipped with a locking cap.

- A flush-mounted, protective steel outer casing was cemented into place for each well, and a two-foot diameter concrete pad was placed around each well. The concrete pad was mounded in order to provide runoff of precipitation and discourage seepage into the well. The protective casing was covered with a screw-down steel cap.

Well development to clear the well screen and sand pack of any fine material which might cause clogging was accomplished by bailing a minimum of three well volumes from the well using a decontaminated bailer. Each well was developed to the satisfaction of the site geologist who monitored the volume of water removed from the well, water color, turbidity, pH, conductivity, and temperature to determine the effectiveness of the development. The well was considered developed when the above criteria became stable. These observations were recorded on the Monitoring Well Development Data form.

2.3.4 Sample Collection

Discrete soil and groundwater grab samples were obtained during all sampling activities. Sampling equipment included a split-spoon soil sampling device, laboratory-supplied sample bottles, disposable Teflon bailers, and disposable latex gloves. Sampling equipment was either decontaminated using a steam cleaner (split-spoons) or discarded after the collection of every sample. No composite or commingled samples were collected for analysis. Soil samples were collected from predetermined depths; from suspected impacted zones based on head-space analysis; or from just above the saturated zone. Samples were assigned a unique sample ID code: the boring number followed by the sampling depth for soil samples (e.g., TB1-1'); or the monitoring well number followed by the code "GW" (to identify the sample as a groundwater sample) and the sampling round (e.g., MW1-GW1); or the tank number followed by the portion of the tank such as tank #4 - bottom east (e.g., T4-BE).

Upon opening each two-foot split-spoon sampler, the recovered soil sample was screened at six-inch intervals for VOCs using a PID head space method, and the observations recorded on the boring log in accordance with the Indiana Department of Environmental Management (IDEM) requirements. The PID screening results can also be found in Table 4. Field screening using head-space analysis was performed by collecting split soil samples and placing one of the samples in a plastic Ziplock bag and the other sample in a laboratory-supplied sample bottle. The soil sample in the Ziplock bag was allowed to sit for approximately 15 minutes in a warm environment to allow constituents to volatilize from the soil, at which time the PID probe was inserted into a small opening in the bag and the VOC concentration measured and recorded in the field log. The split sample containerized in the sample bottle was then either discarded or sent to the laboratory for analysis. While the PID is capable of detecting volatile vapors in the parts-per-million (ppm) range, it was used solely as a field screening device. The PID readings presented in Table 4 do not necessarily correlate to constituent concentrations determined as a result of laboratory analysis of soil samples, which was accomplished using the much more rigorous procedures defined in SW-846.

The following procedure was followed during all soil and groundwater sampling:

- Field sampling equipment was inspected and decontaminated prior to use in the field and between each sample depth interval (e.g., split-spoons) or sampling location (e.g., augers and associated drilling equipment);

- Following geologic characterization, soil samples for laboratory analysis were collected using disposable sterile latex gloves. Each soil sample for VOCs, semi-volatile organic compounds, and TPH analysis was containerized in an appropriate laboratory-provided sample container.

- Monitoring wells were purged of at least three well volumes of water prior to groundwater sampling in order to remove stagnant water from the well and verify that a representative groundwater sample was collected from the transmissive unit. Temperature, conductivity, pH, appearance, and odor were measured or noted and recorded on a Groundwater Sampling Log Sheet. In the event that these indicator parameters were not stable after removing three well volumes of groundwater from the well, an additional two well volumes of water were purged prior to sampling

- Groundwater samples were collected using three-foot long disposable Teflon bailers which were decontaminated by the manufacturer and sealed inside plastic packaging for storage until use. Bailers were not removed from the packaging until immediately prior to sampling.

- To establish the documentation necessary to trace sample possession from the time of collection, a Chain of Custody/Request for Analysis form accompanied each sample shipment. This form contained the sample numbers, the date and time of collection, the sample type, the sample location (i.e., well number), the number of containers, parameters requested for analysis, method of preservation, and signature of person(s) involved in the chain of possession, sample temperature documentation, and the name/address of the laboratory receiving the samples. Copies of the Chain-of-Custody forms for the APT site investigation are included in Appendix B.

- The samples were placed in a cooler packed with ice or ice packs to maintain the samples at approximately 4°C and transported to the laboratory at the earliest opportunity. The cooler was sealed and the appropriate documents were taped to the inside lid of the cooler.

2.4 SAMPLE ANALYSIS

All soil and groundwater samples which were subjected to laboratory analyses were analyzed using SW846 Methods to obtain high-quality data. Those soil samples which were tested for TPH were analyzed using Method 8015-Modified; soil and groundwater samples which were tested for VOCs were analyzed using Method 8240; soil and groundwater samples which were tested for SVOCs were analyzed using Method 8270.

Soil samples were containerized in single 4-ounce widemouth clear glass jars (one jar per sample per analyte) equipped with Teflon sealed lids. Preservation of the soil samples was accomplished by

cooling to 4° C; no other preservation technique was used. Groundwater samples that were analyzed for VOCs were containerized in two 40-ml clear glass vials per sample and preserved with HCl to a pH of less than 2. Groundwater samples that were analyzed for SVOCs or TPH were containerized in two 1-L amber glass bottle with Teflon sealed lids. Groundwater samples were also cooled to a temperature of 4° C. A summary of analytical methods and sample collection requirements is presented in Table 5. A summary of the soil and groundwater sampling performed at the facility, including sample numbers, dates, and analyses is presented in Table 6.

2.5 SITE INVESTIGATION RESULTS

The results of the APT site investigation are presented in the following sections and include the results of the laboratory analyses performed on soil and groundwater samples, as well as a characterization of the hydrogeologic framework at the site.

2.5.1 Soil Sample Analysis Results

The site investigation included the collection and analyses of 82 soil samples for constituents that may have been released from the seventeen former USTs at the facility. A total of 54 of these soil samples were collected from soil borings and monitoring wells drilled during the site investigation, and 28 soil samples were collected during closure of the four USTs located beneath the west building. Seventy-one of the 82 soil samples were analyzed for TPH, forty-seven samples were analyzed for VOCs, and seventy-three samples were analyzed for SVOCs (Table 6). The results of these analyses are discussed below.

TPH

Seventy-one soil samples were analyzed for TPH. Forty-three samples were collected from soil boring and monitoring well locations and twenty-eight samples were collected during the closure of the four tank UST system located beneath the west building.

Petroleum hydrocarbons were detected in eight of the forty-three soil boring samples and in five of the twenty-eight UST closure samples. The concentration of TPH in these samples ranged from 11 mg/kg (MW15D-40') to 30,000 mg/kg (MW1D-38'). The petroleum hydrocarbons were identified as motor oil and diesel. The observed TPH concentrations exceeded the IDEM LUST cleanup objective of 100 mg/kg in four of the soil boring samples and two of the UST closure samples: MW1D-38' (39,000 mg/kg TPH-motor oil); MW2-21' (930 mg/kg TPH-motor oil); MW7-40' (320 mg/kg TPH-diesel); MW20D-42' (290 mg/kg TPH-diesel); T4-SSE (2,300 mg/kg TPH-diesel); and T4-NSW (3,600 mg/kg TPH-diesel).

Monitoring wells MW-1D, MW-2, and MW-7 are located immediately downgradient of the four tank UST system and MW-20D is an off-site monitoring well located northeast of the Allied facility.

The remaining four TPH detections (i.e., those where the TPH concentration was less than 100 mg/kg) correspond to soil samples collected from soil boring locations MW-4, MW-15D, and TB-5 (two samples). Soil sample MW4-21', collected at a location downgradient of the four tank UST system, contained 43 mg/kg TPH-motor oil. TPH-gasoline was detected at a concentration of 11 mg/kg in MW15D-40' which is located along the northern boundary of the site. Soil boring TB-5, which is downgradient of the former 10,000-gallon UST located north of the east building, had TPH

detections at two depths. TPH-motor oil was detected at a concentration of 78 mg/kg at TB5-11', and TPH-gasoline was detected at a concentration of 59 mg/kg at TB5-24'.

A summary of the TPH analytical results for the soil samples is presented in Table 7. The horizontal and vertical distributions of TPH in soil are presented in Figures 6 and 7.

VOCs

Forty-seven soil samples were analyzed for VOCs. Twenty-eight soil samples were collected during the closure of the four former 4,000-gallon UST system located beneath the west building, and nineteen soil samples were collected from 17 soil boring and monitoring well boring locations.

All twenty-eight of the closure samples and eighteen of the nineteen samples collected from soil borings/monitoring well borings exhibited detectable concentrations of one or more VOC constituents. Acetone, 2-butanone, carbon disulfide, 1,2-dichloroethene, ethylbenzene, 2-hexanone, methylene chloride, 1,1,2,2-tetrachloroethane, tetrachloroethene, toluene, trichloroethene, and xylenes were detected in at least one sample.

Acetone was detected in 37 samples at concentrations ranging from 2.0 ug/kg (MW13S-23.4') to 1,000 ug/kg (T1-SSE). The constituent 2-butanone was detected in 19 samples at concentrations ranging from 2.6 ug/kg (T1-WE and T2-SSW) to 44 ug/kg (T4-BE). Carbon disulfide was detected in one sample (T4-NSE) at a concentration of 2.7 ug/kg. The constituent 1,2-dichloroethene was detected in two samples at concentrations of 5.8 ug/kg (T3-EE) and 8.7 ug/kg (T4-NSE). Ethylbenzene was detected in two samples at concentrations of 4.2 ug/kg (T3-EE) and 6.1 ug/kg (T4-NSE). The constituent 2-hexanone was detected in one sample (T4-BE) at a concentration of 12 ug/kg. Methlyene chloride was detected in 17 samples at concentrations ranging from 2.0 ug/kg (MW15S-25.5') to 22 ug/kg (T1-EE). The constituent 1,1,2,2-tetrachloroethane was detected in one sample (T1-SSE) at a concentration of 610 ug/kg. Tetrachloroethene was detected in 35 samples at concentrations ranging from 3.9 ug/kg (MW6-21.5') to 72,000 ug/kg (T2-SSE). Toluene was detected in six samples at concentrations ranging from 2.4 ug/kg (T4-SSE) to 7 ug/kg (T4-NSE). Trichloroethene was detected in four samples at concentrations ranging from 2.0 ug/kg (MW15S-25.5') to 6.8 ug/kg (T3-EE). Xylenes were detected in four samples at concentrations ranging from 2.5 ug/kg (MW1D-38') to 24 ug/kg (T4-NSE).

Two VOC constituents were detected in soil samples at concentrations exceeding their VRP Tier II cleanup objectives for a non-residential scenario: PCE and 1,1,2,2-tetrachloroethane. The cleanup objective of 8,010 ug/kg for PCE was exceeded in six of the 28 UST closure soil samples collected from the immediate vicinity of the four 4,000-gallon USTs. The cleanup objective of 210 ug/kg for 1,1,2,2-tetrachloroethane was exceeded in UST closure sample T1-SSE. None of the soil samples collected from the soil borings and monitoring wells exhibited VOC concentrations in excess of the VRP Tier II cleanup objectives for a non-residential scenario. Also acetone, 2-butanone, and methylene chloride are common laboratory contaminants. The observed concentrations of these three constituents may be artifacts of laboratory contamination.

The analytical results for VOCs are summarized in Table 8. The vertical and horizontal distribution of PCE in soil is illustrated in Figures 8 and 9.

detections at two depths. TPH-motor oil was detected at a concentration of 78 mg/kg at TB5-11', and TPH-gasoline was detected at a concentration of 59 mg/kg at TB5-24'.

A summary of the TPH analytical results for the soil samples is presented in Table 7. The horizontal and vertical distributions of TPH in soil are presented in Figures 6 and 7.

VOCs

Forty-seven soil samples were analyzed for VOCs. Twenty-eight soil samples were collected during the closure of the four former 4,000-gallon UST system located beneath the west building, and nineteen soil samples were collected from 17 soil boring and monitoring well boring locations.

All twenty-eight of the closure samples and eighteen of the nineteen samples collected from soil borings/monitoring well borings exhibited detectable concentrations of one or more VOC constituents. Acetone, 2-butanone, carbon disulfide, 1,2-dichloroethene, ethylbenzene, 2-hexanone, methylene chloride, 1,1,2,2-tetrachloroethane, tetrachloroethene, toluene, trichloroethene, and xylenes were detected in at least one sample.

Acetone was detected in 37 samples at concentrations ranging from 2.0 ug/kg (MW13S-23.4') to 1,000 ug/kg (T1-SSE). The constituent 2-butanone was detected in 19 samples at concentrations ranging from 2.6 ug/kg (T1-WE and T2-SSW) to 44 ug/kg (T4-BE). Carbon disulfide was detected in one sample (T4-NSE) at a concentration of 2.7 ug/kg. The constituent 1,2-dichloroethene was detected in two samples at concentrations of 5.8 ug/kg (T3-EE) and 8.7 ug/kg (T4-NSE). Ethylbenzene was detected in two samples at concentrations of 4.2 ug/kg (T3-EE) and 6.1 ug/kg (T4-NSE). The constituent 2-hexanone was detected in one sample (T4-BE) at a concentration of 12 ug/kg. Methlyene chloride was detected in 17 samples at concentrations ranging from 2.0 ug/kg (MW15S-25.5') to 22 ug/kg (T1-EE). The constituent 1,1,2,2-tetrachloroethane was detected in one sample (T1-SSE) at a concentration of 610 ug/kg. Tetrachloroethene was detected in 35 samples at concentrations ranging from 3.9 ug/kg (MW6-21.5') to 72,000 ug/kg (T2-SSE). Toluene was detected in six samples at concentrations ranging from 2.4 ug/kg (T4-SSE) to 7 ug/kg (T4-NSE). Trichloroethene was detected in four samples at concentrations ranging from 2.0 ug/kg (MW15S-25.5') to 6.8 ug/kg (T3-EE). Xylenes were detected in four samples at concentrations ranging from 2.5 ug/kg (MW1D-38') to 24 ug/kg (T4-NSE).

Two VOC constituents were detected in soil samples at concentrations exceeding their VRP Tier II cleanup objectives for a non-residential scenario: PCE and 1,1,2,2-tetrachloroethane. The cleanup objective of 8,010 ug/kg for PCE was exceeded in six of the 28 UST closure soil samples collected from the immediate vicinity of the four 4,000-gallon USTs. The cleanup objective of 210 ug/kg for 1,1,2,2-tetrachloroethane was exceeded in UST closure sample T1-SSE. None of the soil samples collected from the soil borings and monitoring wells exhibited VOC concentrations in excess of the VRP Tier II cleanup objectives for a non-residential scenario. Also acetone, 2-butanone, and methylene chloride are common laboratory contaminants. The observed concentrations of these three constituents may be artifacts of laboratory contamination.

The analytical results for VOCs are summarized in Table 8. The vertical and horizontal distribution of PCE in soil is illustrated in Figures 8 and 9.

SVOCs

Seventy-three soil samples were collected and analyzed for SVOCs. Forty-five samples were collected from 29 soil boring and monitoring well locations and twenty-eight samples were collected during the four tank UST closure.

Sixty of the seventy-three soil samples (thirty-nine of the forty-five soil boring/monitoring well samples and twenty-one of the twenty-eight closure samples) exhibited detectable concentrations of one or more SVOC constituents. Benzo (a) anthracene, benzo (a) pyrene, benzo (b) fluoranthene, benzo (ghi) perylene, benzo (k) fluoranthene, bis(2-ethylhexyl) phthalate, carbazole, chrysene, di-n-butyl phthalate, diethyl phthalate, di-n-octyl phthalate, fluoranthene, indeno (1,2,3-cd) pyrene, 2-methylnaphalene, naphthalene, phenathrene, and pyrene were detected in at least one sample.

Benzo (a) anthracene was detected in three samples at concentrations ranging from 51 ug/kg at (MW25D-26') to 120 ug/kg (MW15D-40' and TB5-11'). Benzo (a) pyrene was detected in four samples at concentrations ranging from 6.9 ug/kg (MW2-21') to 130 ug/kg (TB5-11'). Benzo (b) fluoranthene was detected in four samples at concentrations ranging from 51 ug/kg (MW25D-26') to 200 ug/kg (TB5-11'). Benzo (ghi) perylene was detected in three samples at concentrations ranging from 35 ug/kg (MW2-21') to 60 ug/kg (TB5-11'). Benzo (k) fluoranthene was detected in three samples at concentrations ranging from 44 ug/kg (TB1-12') to 80 ug/kg (TB5-11'). Bis(2-ethylhexyl) phthalate was detected in 35 samples at concentrations ranging from 43 ug/kg (MW21D-25') to 4,600 ug/kg (MW11D-25'). Carbazole was detected in one sample (T1-NSW) at a concentration of 35 ug/kg. Chrysene was detected in five samples at concentrations ranging from 50 ug/kg (MW25D-26') to 930 ug/kg (T3-NSE). Di-n-butyl phthalate was detected in 49 samples at concentrations ranging from 37 ug/kg (T3-BW) to 1,800 ug/kg (TB7-25'). Diethyl phthalate was detected in one sample (T2-SS) at a concentration of 42 ug/kg. Di-n-octyl phthalate was detected in one sample (MW21D-44') at a concentration of 240 ug/kg. Fluoranthene was detected in six samples at concentrations ranging from 49 ug/kg (TB1-12') to 300 ug/kg (TB5-11'). Indeno (1,2,3-cd) pyrene was detected in three samples at concentrations ranging from 37 ug/kg (MW2-21') to 60 ug/kg at (TB5-11'). The constituent 2-methylnaphalene was detected in one sample (TB5-24') at a concentration of 200 ug/kg. Naphthalene was detected in one sample (TB5-24') at a concentration of 230 ug/kg. Phenathrene was detected in nine samples at concentrations ranging from 50 ug/kg (MW25D-42') to 2,100 ug/kg (T4-SSE). Pyrene was detected in eight samples at concentrations ranging from 42 ug/kg (MW10D-42') to 670 ug/kg at (T3-NSE).

However, neither the IDEM LUST nor the Tier II cleanup objectives for individual SVOC constituents were exceeded in any of the samples, nor was the cleanup goal for total SVOCs of 10,000 mg/kg exceeded in any samples. The analytical results are presented in Table 9 and the distribution of total SVOCs is illustrated in Figure 10.

2.5.2 Groundwater Sample Analysis Results

The site investigation included the analyses of 68 groundwater samples. Thirty-four samples were analyzed for TPH, forty-three samples were analyzed for VOCs, and twenty-six samples were analyzed for SVOCs (Table 6). The results of these analyses are discussed below.

TPH

Thirty-four groundwater samples were collected from 32 monitoring wells (both shallow and deep) and analyzed for TPH (Table 6). Petroleum hydrocarbons were detected in 18 of these 34 samples. The IDEM LUST cleanup objective of 100 ug/L was exceeded in all eighteen samples.

Several sampling locations downgradient from former UST systems exhibited TPH concentrations above the cleanup objective. The analytical data indicates that relatively high concentrations of TPH are present in groundwater: near the former four 4,000-gallon UST system under the west building; downgradient of the 10,000-gallon UST located northeast of the east building; downgradient of the former 5,000-gallon UST located along the east wall of the west building; downgradient of the former 20,000-gallon UST located northwest of the west building; at off-site locations approximately 0.25 mile northeast of the Allied facility; and the southeast corner of the facility.

TPH-motor oil, TPH-diesel fuel, and TPH-gasoline constituents were identified in monitoring wells located downgradient of the of the former four tank UST system.

Groundwater samples collected from monitoring wells MW-E, MW-2, MW-3, MW-4, MW-7, and MW-12 exhibited TPH concentrations ranging from 100 ug/L (MW-15S) to 42,000 ug/L (MW-E). TPH-motor oil was identified in groundwater samples collected from monitoring wells MW-E (42,000 ug/L); MW-2 (1,400 ug/L), MW-3 (2,500 ug/L); MW-4 (1,400 ug/L); and MW-12 (570 ug/L). TPH-diesel fuel at a concentration of 260 ug/L was identified in a groundwater sample collected from monitoring well MW-7. TPH-gasoline at a concentration of 150 ug/L was identified in a groundwater sample collected from monitoring well MW-2. An unknown hydrocarbon (i.e., not able to be fingerprinted) was detected at a concentration of 130 ug/L in a sample collected from monitoring well MW-7.

TPH-mineral spirits were detected in monitoring well MW-23S located downgradient of the former 10,000-gallon UST system excavation. A groundwater sample collected from this well exhibited a TPH-mineral spirits concentration of 88,000 ug/L. No petroleum hydrocarbons were detected a sample collected from monitoring well MW-23D.

TPH-gasoline and TPH-motor oil were detected at monitoring well cluster location MW-13 and MW-15, both located downgradient of the former 5,000-gallon UST located along the east wall of the west building. Groundwater samples collected from monitoring wells MW-13D and MW-15D exhibited TPH-gasoline concentrations of 120 ug/L and 560 ug/L, respectively. TPH-motor oil was detected at a concentration of 270 ug/L in a sample collected from monitoring well MW-13S. An unknown hydrocarbon was detected at a concentration of 100 ug/L in a sample collected from monitoring well MW-15S.

An unknown hydrocarbon (i.e., not able to be fingerprinted) was detected at a concentration of 840 ug/L in a sample collected from MW-11D. This monitoring well is located immediately downgradient of a former 20,000-gallon UST northwest of the west building.

TPH-gasoline and an unknown hydrocarbon were detected in off-site monitoring wells MW-16D, MW-18D, and MW-20D. Groundwater samples collected from three monitoring wells exhibited TPH concentrations ranging from 110 ug/L (MW-20D) to 480 ug/L (MW-16D). TPH-gasoline was identified in groundwater samples collected from monitoring wells MW-18D (420 ug/L) and MW-20D (110 ug/L). An unidentifiable hydrocarbon was detected at a concentration of 480 ug/L in a sample collected from monitoring well MW-16D.

TPH-gasoline and TPH-motor oil constituents were identified in monitoring well MW-22. Three groundwater samples collected from this well indicate the presence of petroleum hydrocarbons in the groundwater at this location. TPH-gasoline and TPH-motor oil were detected at concentrations of 220 ug/L and 1,900 ug/L, respectively, in one sample; TPH-gasoline was detected at a concentration of 160 ug/L in a second sample; and TPH-motor oil was detected at a concentration of 390 ug/L in a third sample. These petroleum hydrocarbons appears have an off-site source since monitoring well MW-22 is located near the upgradient property line.

The results from the TPH analyses of groundwater samples are summarized in Table 10. The distribution of TPH in the samples from shallow wells is presented in Figure 11; the distribution from the deep well sample analyses is presented in Figure 12. The vertical distribution of TPH in the groundwater is illustrated in Figure 13.

VOCs

Forty-three groundwater samples were analyzed for VOCs (Table 6). Forty of the samples contained detectable concentrations of one or more VOC constituents. Acetone, 2-butanone, 1,1-dicholoroethane, 1,2-dichloroethene, ethylbenzene, methylene chloride, tetrachloroethene, toluene, 1,1,1-trichloroethane, vinyl chloride, and xylenes were detected in at least one sample.

Acetone was detected in eight samples at concentrations ranging from 3.0 ug/L (MW17S-GW) to 15 ug/L (WW2-GW1). The constituent 2-butanone was detected in two samples at concentrations of 3.8 ug/L (MW18D-GW1) to 8.4 ug/L (MW16D-GW1). The constituent 1,1-dicholoroethane was detected in one sample (MW19S-GW1) at a concentration of 2.1 ug/L. The constituent 1,2-dichloroethene was detected in five samples at concentrations ranging from 4.0 ug/L (MW12-GW1) to 42 ug/L (MW13S-GW1). Ethylbenzene was detected in four samples at concentrations ranging from 3.4 ug/L (MW-5 and MW5D-GW1) to 5.5 ug/L (MW20S-GW1). Methylene chloride was detected in three samples at concentrations ranging from 2.3 ug/L (MW-6) to 5.3 ug/L (MW-Exst). Tetrachloroethene was detected in 19 samples at concentrations ranging from 2.3 ug/L (MW-4) to 510 ug/L (MW15S-GW1). Toluene was detected in nine samples at concentrations ranging from 2.0 ug/L (MW10D-GW1) to 34 ug/L (MW20S-GW1). The constituent 1,1,1-trichloroethane was detected in nine samples at concentrations ranging from 2.2 ug/L (MW23D-GW1) to 6.8 ug/L (MW20D-GW1 and MW21S-GW1). Vinyl chloride was detected in two samples at concentrations of 7.3 ug/L (MW-Exst) to 26 ug/L (MW17S-GW1). Xylenes were detected in 8 samples at concentrations ranging from 7.1 ug/L (MW24D-GW1) to 300 ug/L (MW23S-GW1).

Two constituents were detected above the VRP Tier II non-residential scenario cleanup criteria: tetrachloroethene and vinyl chloride. PCE was detected at concentrations exceeding the Tier II cleanup goal of 56.1 ug/L in eight samples (MW-1, MW-2, MW-6, MW13-GW1, MW13D-GW1, MW15D-GW1. and MW15-GW2). The highest concentrations of PCE were measured at monitoring wells MW-13S, MW-13D, MW-15S and MW-15D which are located in the northern portion of the site. Concentrations of PCE in groundwater samples collected from these wells are 410 ug/L, 460 ug/L, 510 ug/L, and 240 ug/L, respectively. The remaining samples which contained PCE at concentrations above the cleanup objective were collected from monitoring wells located near the former four 4,000-gallon UST system beneath the west building. Groundwater samples collected from MW-1S, MW-2, and MW-6 contained PCE concentrations of 110 ug/L, 320 ug/L, and 150 ug/L, respectively.

Vinyl chloride (a byproduct of the degradation of PCE) was detected in one sample (MW17S-GW1) at a concentration exceeding the Tier II cleanup goal of 10 ug/L. Monitoring well MW-17S is an off-site monitoring well located northeast of the Allied property.

The groundwater sample analyses are summarized in Table 11 and the distribution of PCE in groundwater is illustrated in Figures 14, 15 and 16.

SVOCs

Twenty-six groundwater samples were analyzed fro SVOCs (Table 6). Twenty-one of the samples contained detectable concentrations of one or more SVOC constituents. Benzo (b) fluoranthene, bis(2-ethylhexyl) phthalate, carbazole, chrysene, di-n-butyl phthalate, diethyl phthalate, di-n-octyl phthalate, fluoranthene, 2-methylnaphalene, naphthalene, 4-nitrophenol, pentachlorophenol, phenol,, and pyrene were detected in at least one sample

Benzo (b) fluoranthene was detected in two samples at concentrations of 1.6 ug/L (MW-3) to 6.0 ug/L (MW-3). Bis (2-ethylhexyl) phthalate was detected in 18 samples at concentrations ranging from 1.0 ug/L (MW18D-GW2) to 300 ug/L (MW-Exst). Carbazole was detected in one sample (MW18D-GW1) at a concentration of 1.0 ug/L. Chrysene was detected in three samples at concentrations ranging from 1.6 ug/L (MW-3) to 13 ug/L (MW-Exst). Di-n-butyl phthalate was detected in seven samples at concentrations ranging from 1.0 ug/L (MW13D-GW1) to 2.5 ug/L (MW23D-GW1). Di-n-octyl phthalate was detected in one sample (MW16D-GW2) at a concentration of 1.3 ug/L. Fluoranthene was detected in three samples at concentrations ranging from 1.4 ug/L (MW-6) to 18 ug/L (MW-3). The constituent 2-methylnaphalene was detected in one sample (MW23S-GW1) at a concentration of 160 ug/L. Naphthalene was detected in four samples at concentrations ranging from 1.2 ug/L (MW25D-GW1) to 520 ug/L (MW23S-GW1). The constituent 4-nitrophenol was detected in one sample (MW23S-GW1) at a concentration of 12 ug/L. Pentachlorophenol was detected in one sample (MW-3) at a concentration of 82 ug/L. Phenol was detected in one sample (MW18D-GW1) at a concentration of 1.5 ug/L. Pyrene was detected in three samples at concentrations ranging from 3.4 ug/L (MW-3) to 12 ug/L (MW-3).

Two SVOC constituents were detected above the VRP Tier II non-residential scenario cleanup objective: bis(2-ethylhexyl) phthalate and pentachlorophenol. The sample collected from monitoring well MW-E contained bis(2-ethylhexyl) phthalate at a concentration of 300 ug/L. However, bis(2-ethylhexyl) phthalate is a common laboratory contaminant, and it was not utilized in the facility's manufacturing operations. A second sample, collected from monitoring well MW-3 detected pentachlorophenol at a concentration of 82 ug/L. This location was resampled and pentachlorophenol was not detected.

The results from the SVOC analyses of groundwater samples are summarized in Table 12. The distribution of SVOCs is illustrated in Figures 17 and 18.

2.5.2 Hydrogeologic Investigation Results

Geologic observations made during the drilling program at the Allied Facility indicate that there are two stratigraphic units present beneath the facility. A massive medium to coarse grained sand unit with occasional gravel and silt lenses extends from the topsoil to a depth of approximately 80 feet beneath the surface. A second stratigraphic unit consisting of interbedded sands and clayey silt deposits extends from a depth of approximately 80 feet to bedrock (located at a depth of

approximately 113 feet beneath the ground surface in MW-1D). The sand and clayey silt layers range in thickness from 1 to 10 feet.

Hydrologically, the uppermost unit serves as a massive unconfined aquifer unit with no continuous impermeable layers. The water table is consistently encountered between 21-26 feet below the ground surface in all the monitoring wells on the site. A potentiometric map (Figure 21) developed using groundwater elevation data collected during the site investigation (Table 13) indicates that groundwater flow is toward the northeast, which is consistent with published regional trends and with the local topography. The groundwater gradient (I) is approximately 0.003 ft/ft, and was calculated using the total relative change in groundwater elevation parallel to the direction of flow (i.e., from the most upgradient contour to the most downgradient contour presented in Figure 21) divided by the distance between these two points. The degree of seasonal fluctuation in groundwater elevations was assessed according to water level elevations collected at various times between April 1994 and May 1995 (Table 13). The data indicates that the temporal fluctuations in groundwater elevations are on the order of a few inches. Since the fluctuations were approximately uniformly experienced in all the monitoring wells, the direction of groundwater flow appears to remain constant over time.

While the hydraulic conductivity (k) of the upper sand unit has not been measured, a value of 1×10^{-2} cm/s is typical for these types of deposits. If the effective porosity (n) is assumed to be on the order of 0.30, then an estimated maximum groundwater flow velocity (v) of approximately 0.288 feet/day (105 feet/year) can be calculated using the Darcy equation: $v = (k)(i)/(n)$. This velocity would also approximate the migration rate of volatile constituents entrained in the groundwater. However, the migration rate of petroleum hydrocarbon constituents is expected to be somewhat slower than that of volatile constituents due to their physical and chemical properties.

The individual sand layers in the lower unit may be in hydraulic communication with the upper unit depending on the lateral continuity of the silt layers which occur in this unit. North-south and east-west cross-sectional depictions of the hydrostratigraphic framework are presented in Figures 19 and 20.

3.0 CONCLUSIONS

The results of the site investigation conducted by APT at the Allied facility indicates:

- A single, unconfined, sole source aquifer is present beneath the site. This aquifer unit consists of medium to coarse grained, gravely sands which extend to a depth of approximately eighty feet, and an interbedded sand and clay interval extending from approximately 80 feet to 113 feet (bedrock);

- Soil has been impacted above action limits by 1,1,2,2-tetrachloroethane, PCE, and TPH constituents.

- Groundwater have been impacted above action limits by vinyl chloride, PCE, and TPH constituents.

- There are multiple sources of the observed aforementioned impact. Specifically, TPH releases are believed to have occurred from four separate former UST systems. The PCE release appears to have occurred at a single former UST system.

- The site poses a minimal risk to human health and other sensitive populations. The opportunities for exposure to impacted soil and groundwater are limited given the site characteristics.

The impacted soil areas are confined to the immediate vicinity of former UST systems. Soil impact in the vicinity of a former four tank UST system beneath the west building consists of TPH-motor oil, TPH-diesel, 1,1,2,2-tetrachloroethane, and PCE. Soil impact in the vicinity of a former 10,000-gallon UST located near the northeast corner of the east building consists of TPH-motor oil and TPH-gasoline. Soil impact in the vicinity of a former 20,000-gallon UST located near the northwest corner of the west building consists of unknown (i.e., not able to be fingerprinted) petroleum hydrocarbons.

The extent of impacted groundwater is greater than the extent of impacted soil, and extends beyond the downgradient property boundary. The TPH impact in groundwater appears to be the result of releases from multiple sources whereas the PCE impact in groundwater appears to originate from a single source, the four 4,000-gallon USTs located beneath the west building.

The maximum PCE concentrations were observed in MW-15S and MW-15D, located at the downgradient property boundary. This distribution pattern is consistent with historical data which indicates that a PCE-containing material was stored in the four 4,000-gallon USTs located under the west building during the 1960s. Since these USTs have not been used to store PCE-containing compounds since the 1960s, the zone of maximum PCE impact would be expected to migrate in a downgradient direction with the groundwater flow over time.

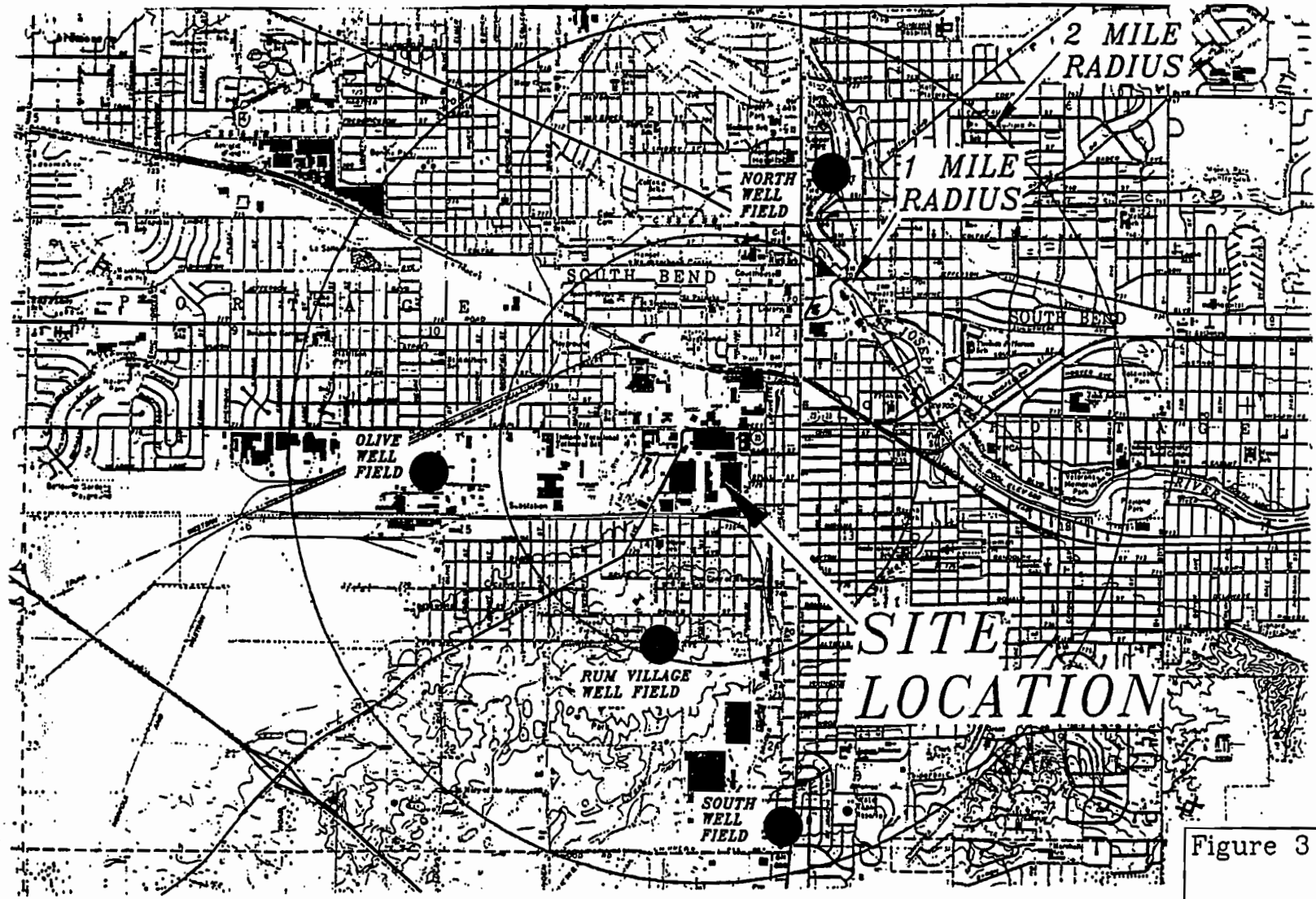
The geometric distribution and variation in type of petroleum hydrocarbons (e.g., TPH-gasoline) detected in groundwater at the facility suggests that there are four separate sources of the TPH impact. There appears to be a diesel and motor oil source at the location of the four 4,000-gallon USTs located beneath the west building (see Figures 6, 11, and 12). These USTs were reported to have contained various petroleum products prior to the 1960s and during the 1970s. A second source of petroleum hydrocarbons appears to be the former 5,000-gallon UST located along the east wall of the west building. Prior to closure in 1992, this UST reportedly contained gasoline. Gasoline was detected in monitoring wells downgradient of this UST, but not in upgradient monitoring wells located between this UST and the four 4,000-gallon USTs (see Figure 12). A third TPH source appears to be the former 20,000-gallon UST located northwest of the west building. Petroleum hydrocarbons (unknown patterns) were detected in a monitoring well located immediately downgradient of the former 20,000-gallon UST (see Figure 12). The former 10,000-gallon UST located north of the east building is a source of groundwater impact Mineral spirits were detected in monitoring well MW-23S located adjacent to the former UST. Soil impact was detected at the time of closure, and motor oil and degraded gasoline were detected in soil samples collected in soil boring TB-5, also located adjacent to the former UST. The former UST is located near the facility property boundary, and Allied was unable to obtain permission to place monitoring wells immediately downgradient of the former UST system. This UST reportedly contained gasoline, kerosene, and mineral spirits during its lifetime.

The presence of an impacted soil layer at a depth of 38-40 feet below the ground surface, and the observation that the TPH impact is greater at depth in the aquifer (deep wells verses shallow wells), is possibly explained by the presence of three large capacity 36-inch diameter water supply wells at the facility (Figure 5). These wells were reportedly used to provide process water for use in the manufacturing operations. It is likely that large-scale pumping of groundwater from these wells lowered the water table to a substantial degree. Any petroleum releases occurring during this period would impact the soil at the elevation of the existing water table, since petroleum products tend to be less dense than water. This impacted soil horizon would continue to be an ongoing source of petroleum hydrocarbons in groundwater even after the original source area (i.e. the UST systems) had been removed.

The site investigation indicates that the site does not pose a risk to human health. The impacted soil is located on the Allied property at a minimum depth of 20 feet below the ground surface. The impacted groundwater is approximately 25 feet below the ground surface and no discharges to the surface have been identified. The groundwater is flowing to the northeast at an estimated velocity of 105 feet/year. The nearest municipal water supply well is one mile upgradient of the facility. The other municipal wells identified in Figure 3 are more than one mile from the site. The St. Joseph River is the closest surface water and is located approximately one mile from the site. The area is provided with a municipal water supply from the City of South Bend. The nearest municipal well fields draw the water supply from a minimum depth of 90 feet below the ground surface and are located upgradient of the facility (see Figure 3).

Preliminary remediation alternatives have been investigated for treatment of the impacted soil and groundwater associated with the site. A groundwater pump and treatment system using granular activated carbon is suggested to remove both the PCE and TPH constituents from groundwater. Air stripping was discarded as a groundwater remediation option due to the presence to TPH which is not readily removed using this technique. Bioventing is recommended to remediate the impact of soil in the vadose zone. Although a preliminary evaluation has been performed with respect to the observed impact and physical characteristics of the site, the actual remediation system will be designed based on the results of feasibility studies and treatability studies, including groundwater flow/constituent transport modeling, specifically designed to assess the performance of various remediation techniques on the site constituents and environment.

DWG: BORDER-L	DATE: 5-2-95	CHKD BY:	REV DATE:	CHKD BY:	REV DATE:	CHKD BY:



SOURCE: U.S.G.S. 7.5-MINUTE TOPOGRAPHIC MAP: SOUTH BEND EAST, IN QUAD (REVISED 1991) AND SOUTH BEND WEST, IN QUAD (PHOTOREVISED 1986).

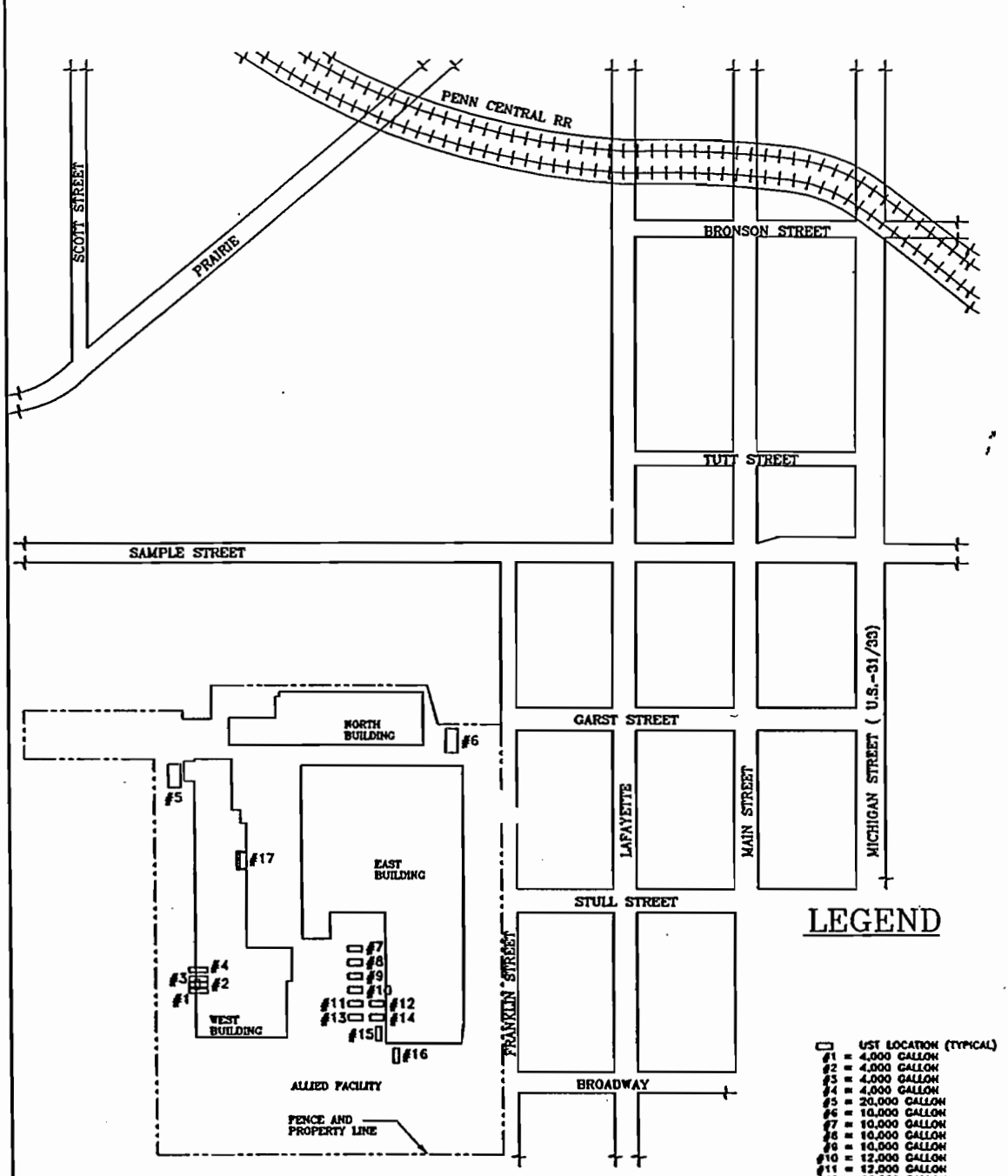
Figure 3

APT

WATER SUPPLY WELLS
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8708-A09	DATE: 2-15-94	CHKD BY: JJK 5-31-95	REV DATE:	CHKD BY:



SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

SCALE 0 300 600 FEET

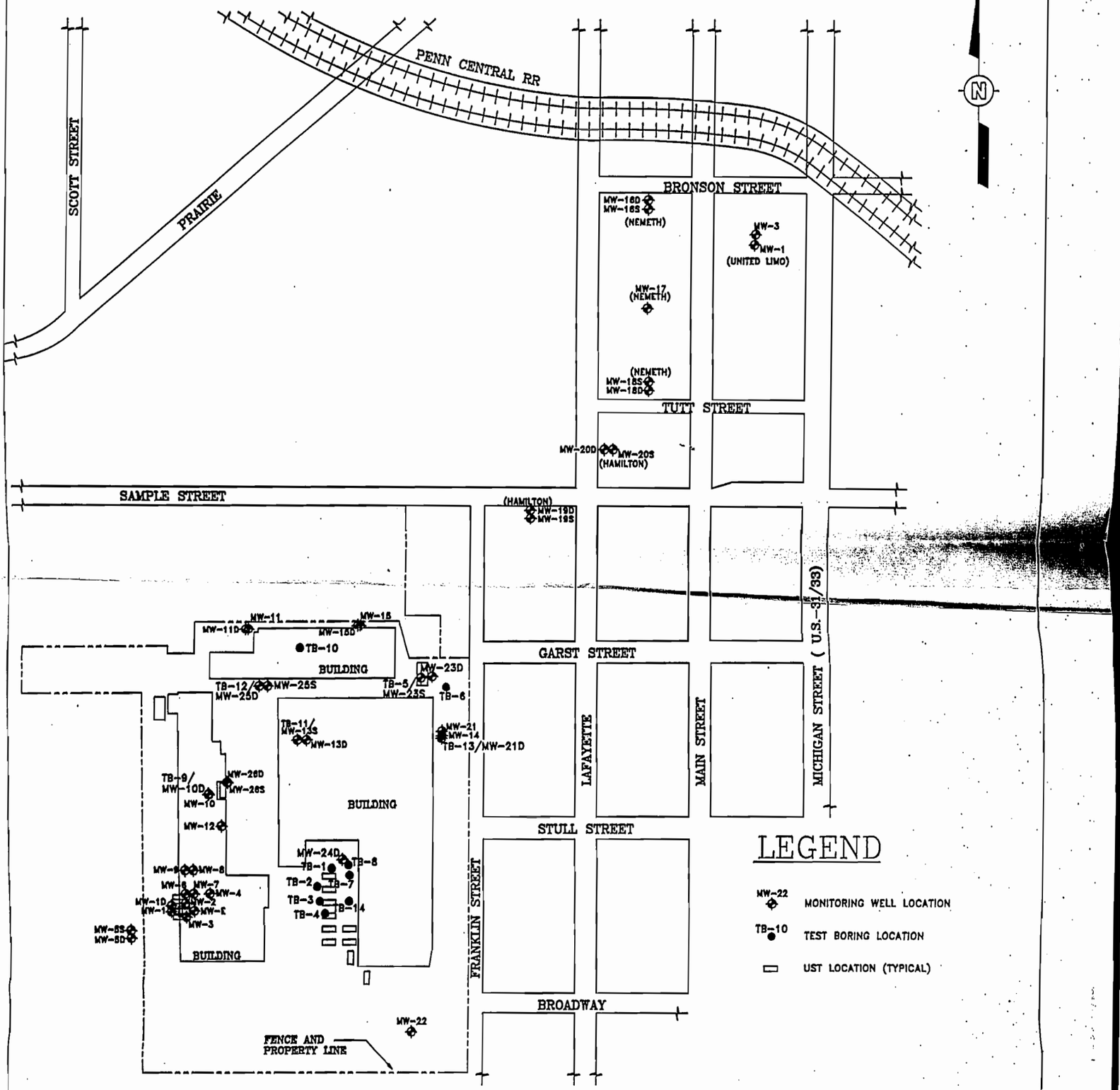
Figure 4

APT

UNDERGROUND STORAGE TANK LOCATIONS
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8708-A10	DATE: 2-15-94	CHKD BY: JKK 5/3/95	REV DATE:	CHKD BY:



SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

SCALE
0 200 400 FEET

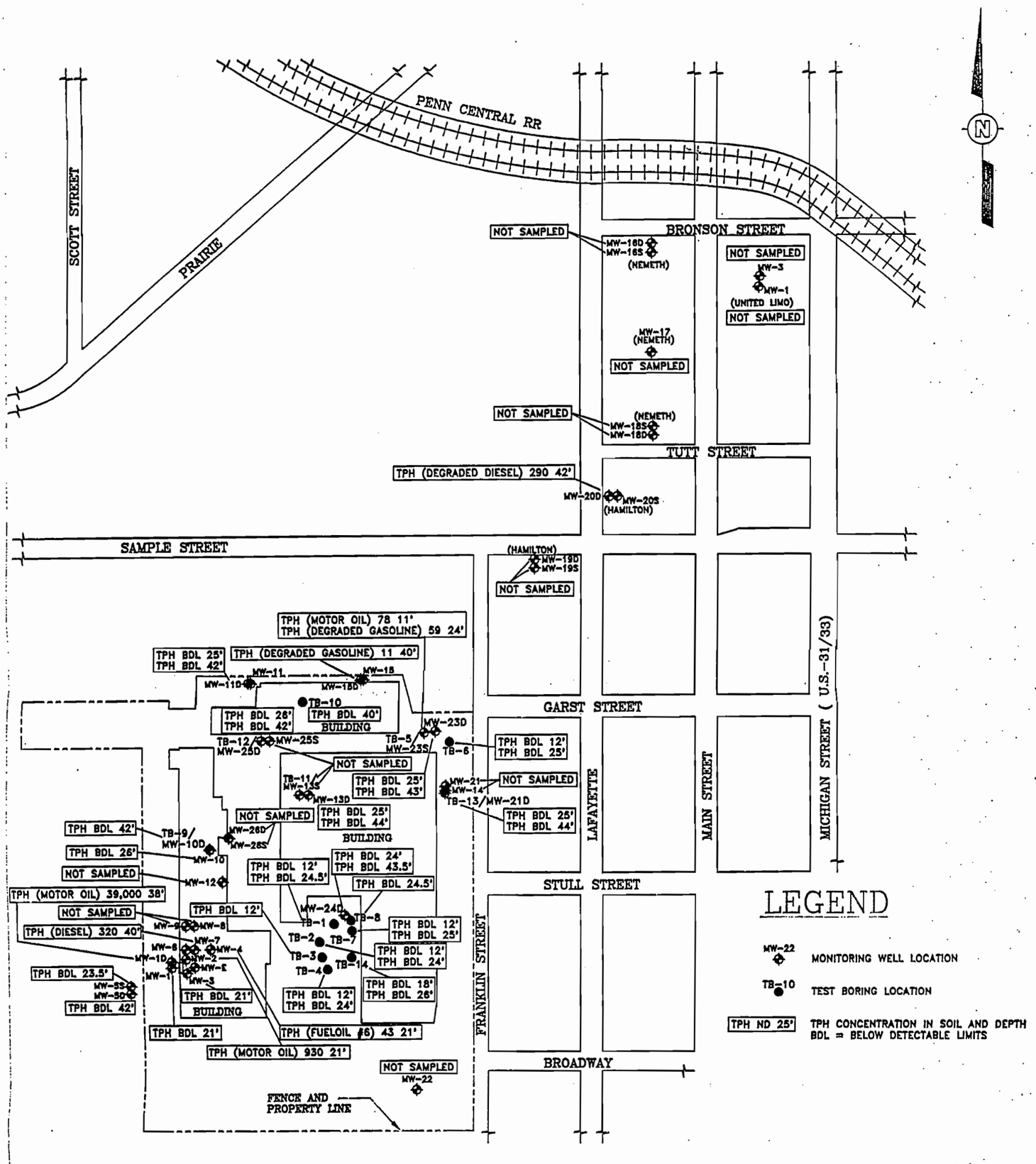
Figure 5

APT

MONITORING WELL AND SOIL BORING LOCATION MAP
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8703-A21	DATE: 3-16-95	CHKD BY: JKR Stallos	REV DATE:	CHKD BY:



NOTE: SOIL RESULTS ARE
IN mg/kg

SOURCE: SURVEY MAP BY L. STRACHMAN,
SCALE 1in = 80ft., DATED 3-13-85.

SCALE
0 200 400 FEET

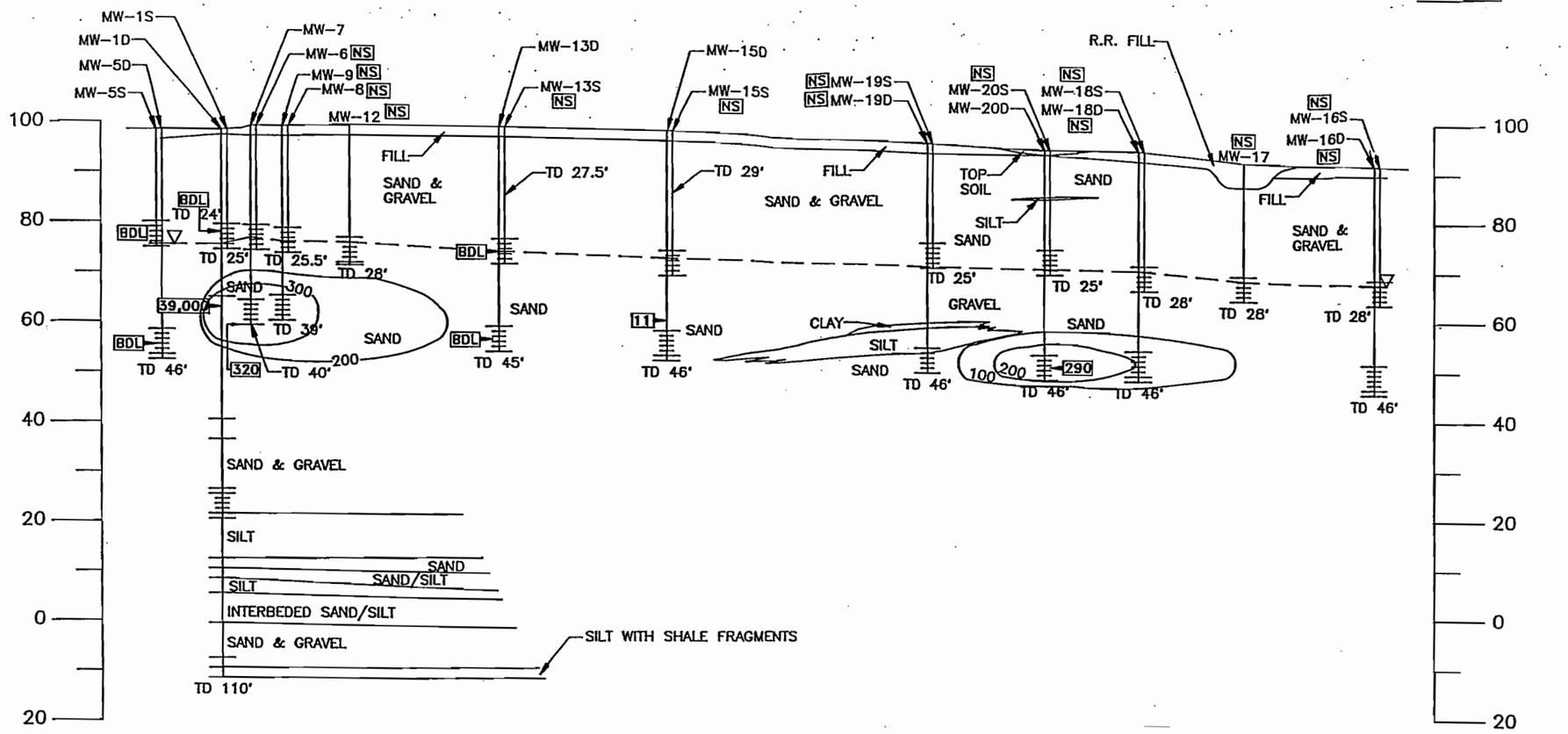
Figure 6

APT

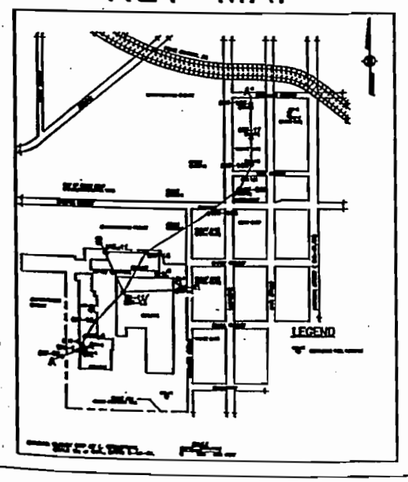
DISTRIBUTION OF
TPH IN SOIL
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8708-A06	DATE: 5-4-95	CHKD BY: JJK 5/31/95	REV DATE:	CHKD BY:



KEY MAP



LEGEND

SCREENED INTERVAL

290 TPH CONCENTRATION IN SOIL (mg/kg)
BDL = BELOW DETECTION LIMIT
NS = NOT SAMPLED

NOTE: ELEVATIONS WERE MEASURED FROM TEMPORARY BENCH MARK (100.00).

SCALE
0 200 400 FEET

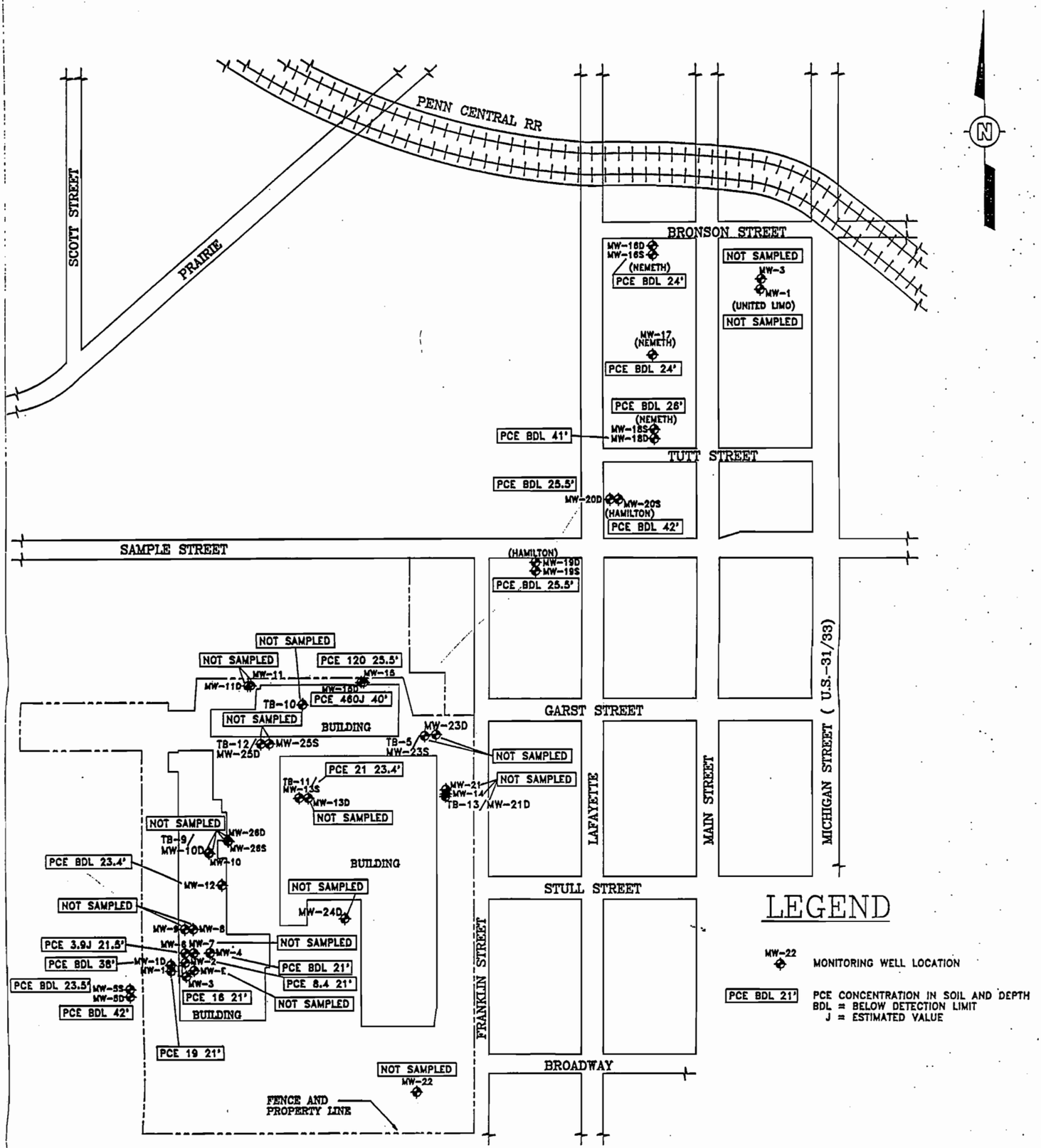
Figure 7

APT

NORTH – SOUTH
CROSS–SECTION A – A'
TPH IMPACTED SOIL
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8703-A20	DATE: 3-16-95	CHKD BY: JHC 8/31/95	REV DATE:	CHKD BY:



LEGEND

MW-22 — MONITORING WELL LOCATION

PCE BDL 21' — PCE CONCENTRATION IN SOIL AND DEPTH
BDL = BELOW DETECTION LIMIT
J = ESTIMATED VALUE

NOTE: SOIL RESULTS ARE IN µg/kg

SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

SCALE
0 200 400 FEET

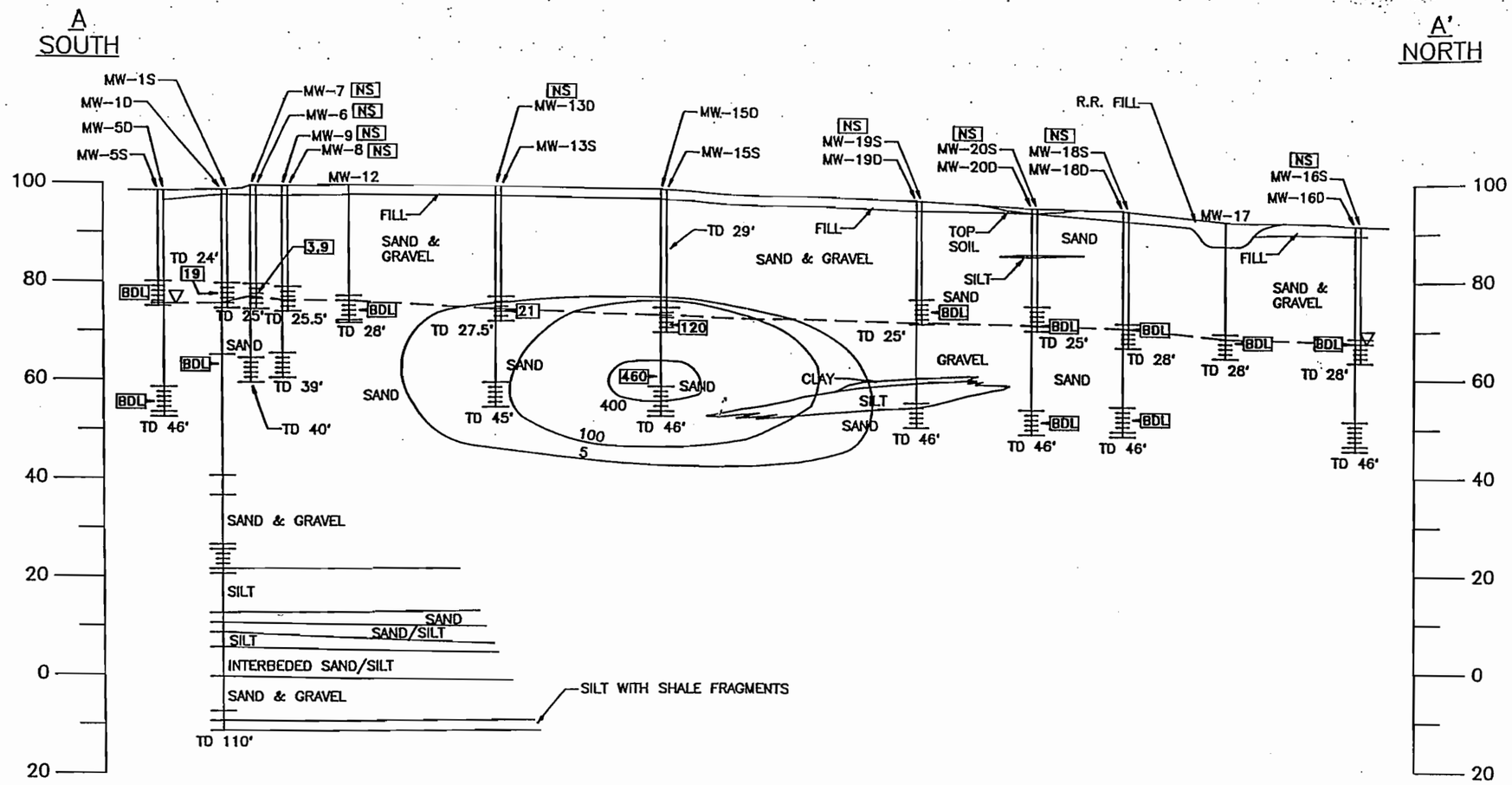
Figure 8

APT

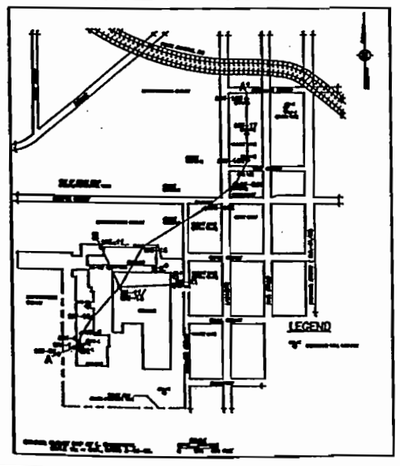
DISTRIBUTION OF
PCE IN SOIL
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8708-A07	DATE: 5-4-95	CHKD BY: JLK 5/31/95	REV DATE:	CHKD BY:



KEY MAP



LEGEND

- SCREENED INTERVAL
- 460 PCE CONCENTRATION IN SOIL (μg/L)
- BDL = BELOW DETECTION LIMIT
- NS = NOT SAMPLED

NOTE: ELEVATIONS WERE MEASURED FROM TEMPORARY BENCH MARK (100.00).

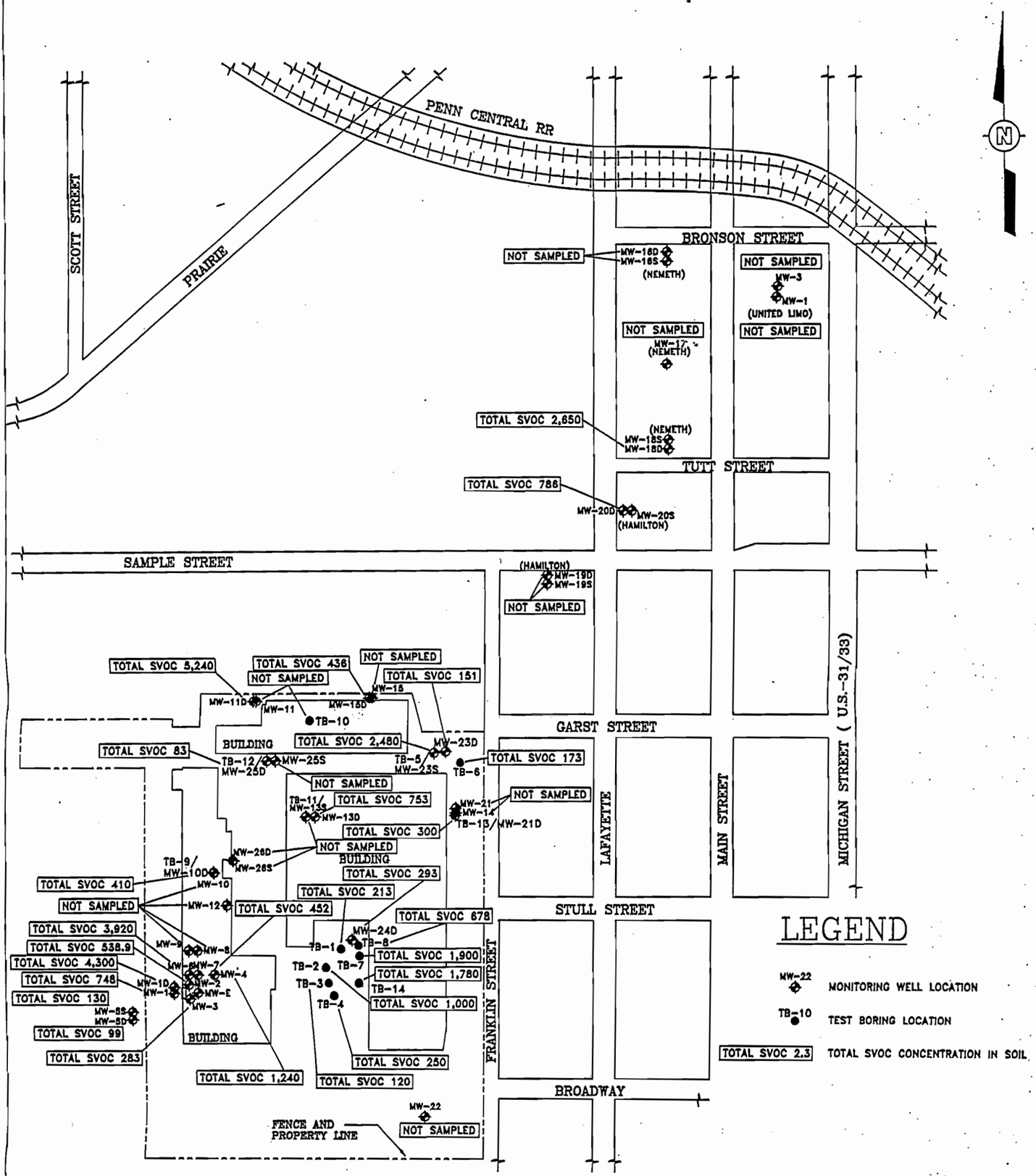
SCALE
0 200 400 FEET

Figure 9

NORTH – SOUTH
CROSS-SECTION A – A'
PCE IMPACTED SOIL
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8703-A22	DATE: 3-16-95	CHKD BY: JEK 5/31/95	REV DATE:	CHKD BY:



NOTE: SOIL RESULTS ARE IN µg/kg

SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

SCALE 0 200 400 FEET

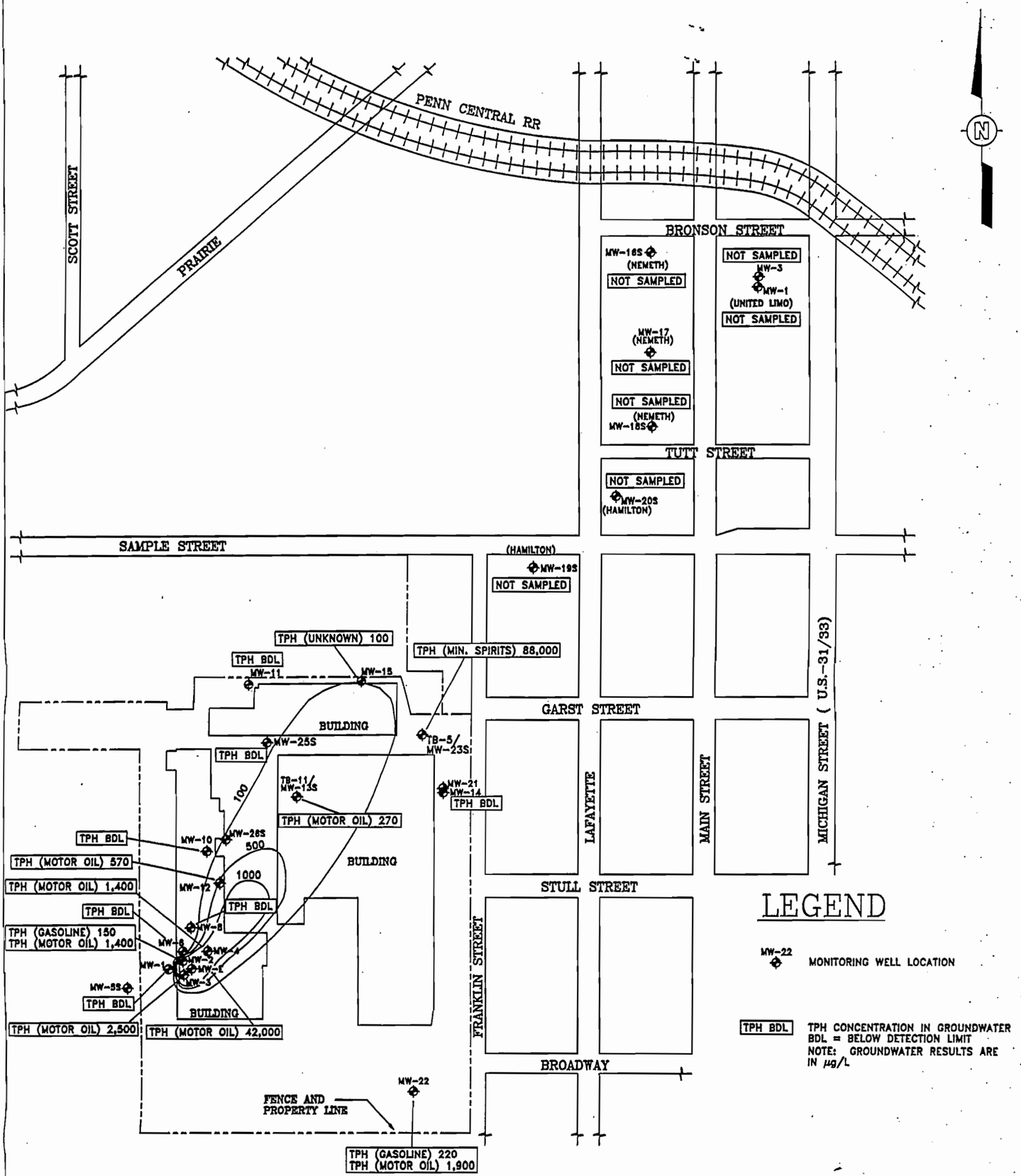
Figure 10

APT

TOTAL SVOC DISTRIBUTION IN SOIL
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8703-A15	DATE: 3-16-95	CHKD BY: JAK 5/31/95	REV DATE:	CHKD BY:



SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

SCALE
0 200 400 FEET

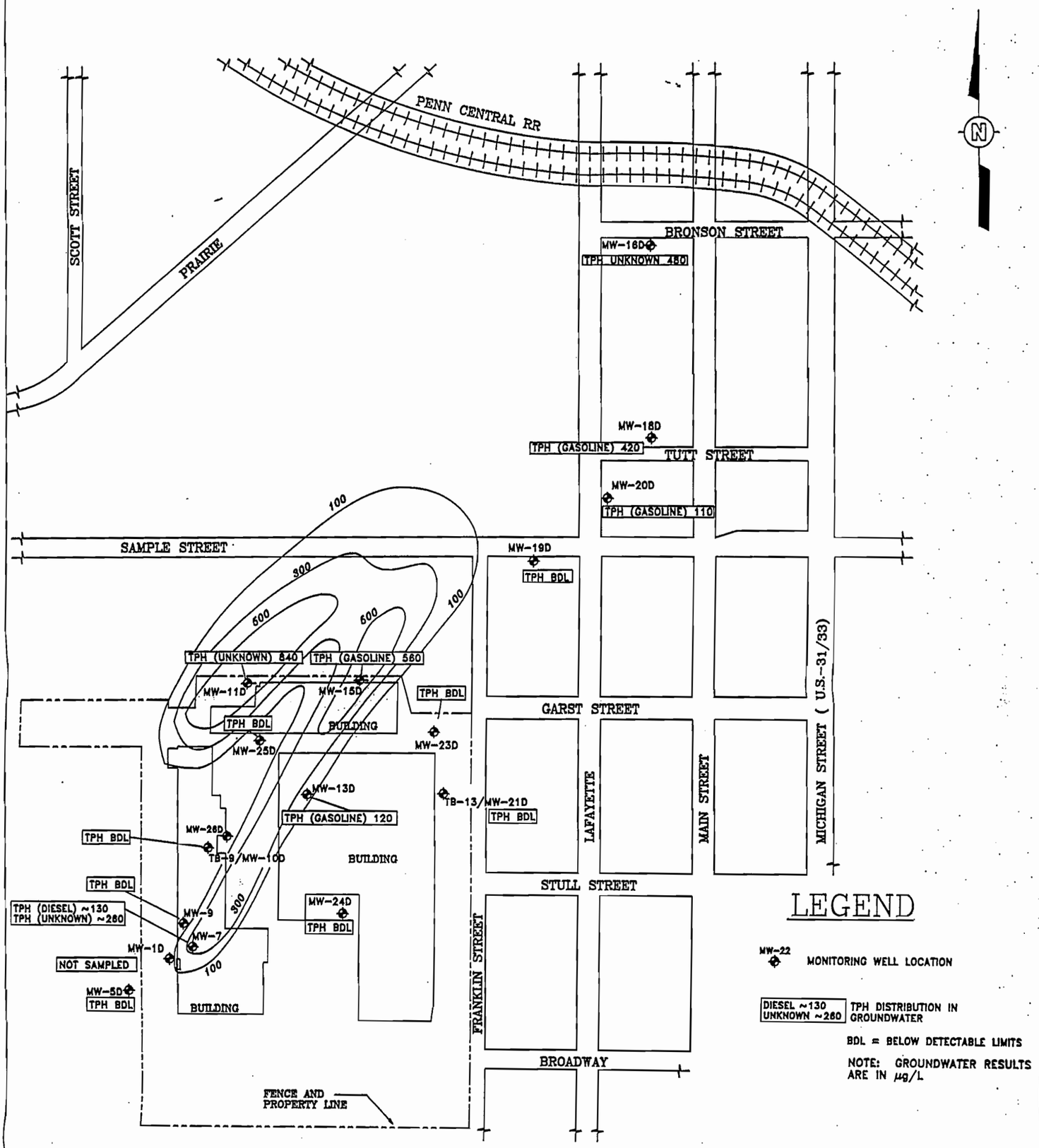
Figure 11

APT

TPH DISTRIBUTION IN GROUNDWATER – SHALLOW
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8703-A14	DATE: 12-5-94	CHKD BY: JHL 5/2/95	REV DATE:	CHKD BY:



SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

SCALE
0 200 400 FEET

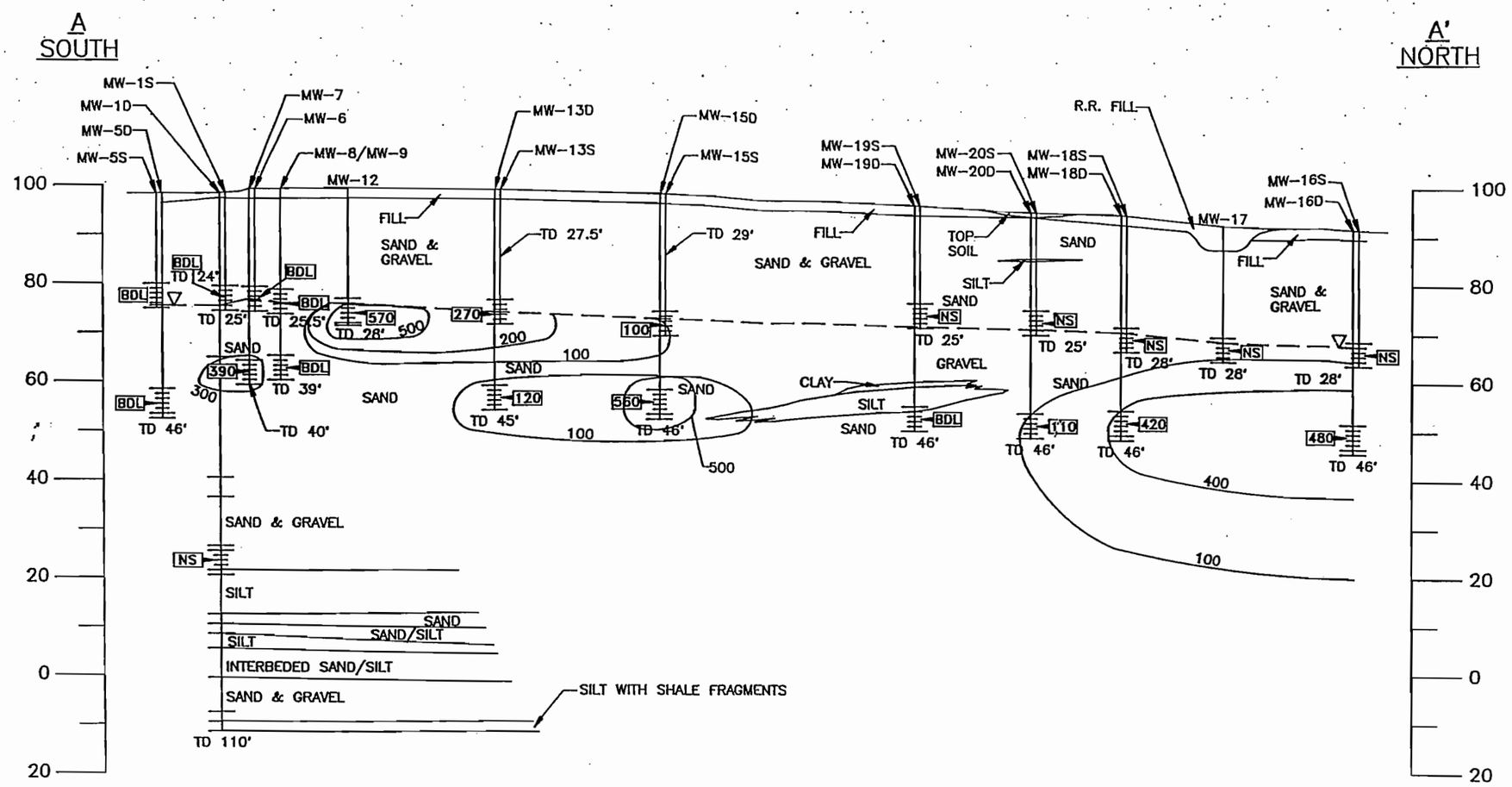
Figure 12

APT

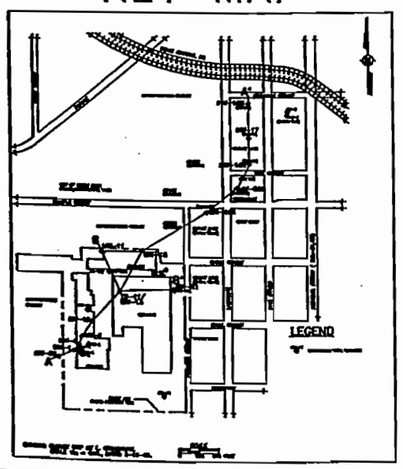
TPH DISTRIBUTION IN GROUNDWATER - DEEP
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8708-A05	DATE: 5-4-95	CHKD BY: JFK 5/31/95	REV DATE:	CHKD BY:



KEY MAP



LEGEND

SCREENED INTERVAL

460 TPH CONCENTRATION IN GROUNDWATER (µg/L)
BDL = BELOW DETECTION LIMIT
NS = NOT SAMPLED

NOTE: ELEVATIONS WERE MEASURED FROM TEMPORARY BENCH MARK (100.00).

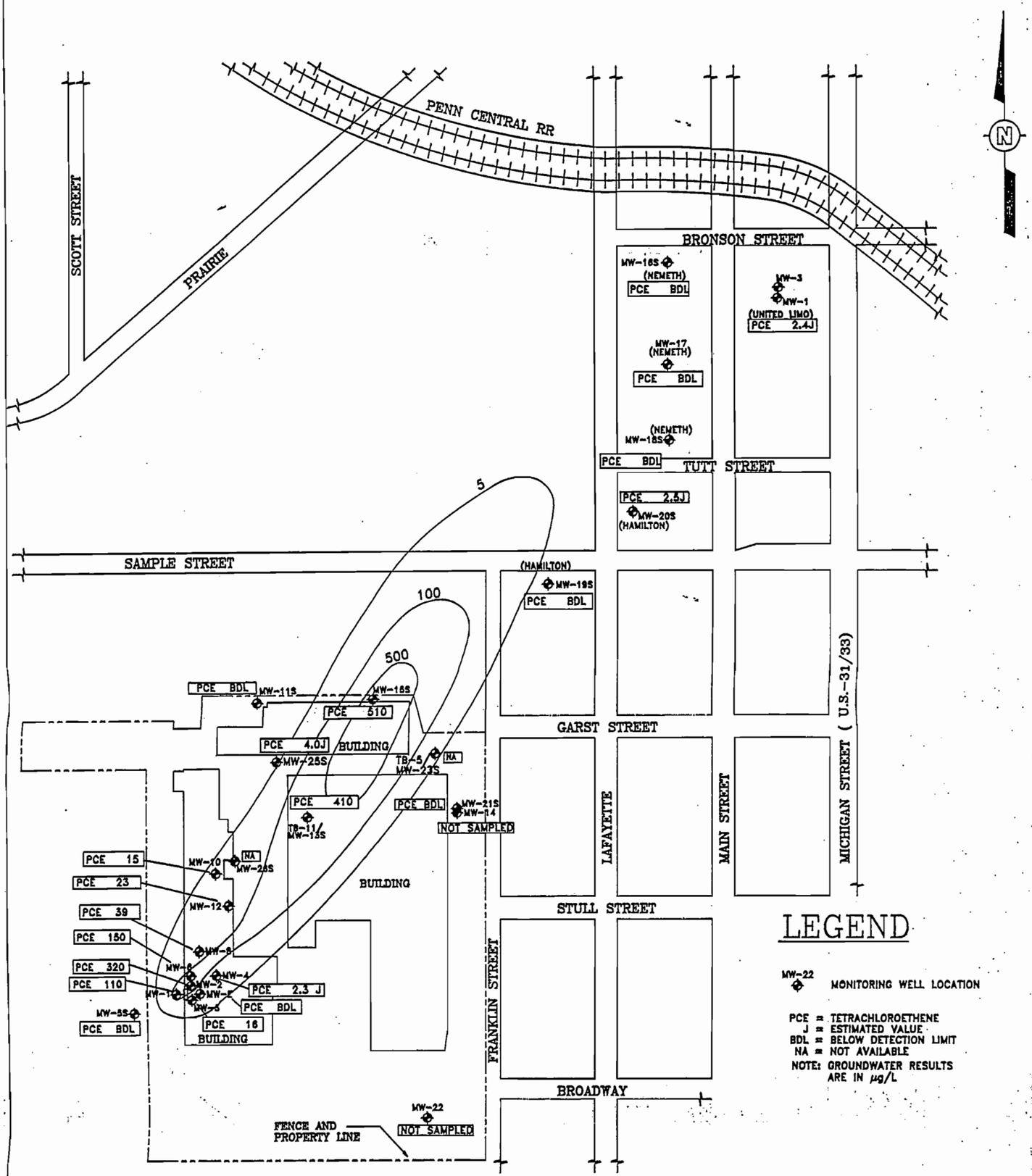
SCALE
0 200 400 FEET

Figure 13

NORTH – SOUTH
CROSS–SECTION A – A'
TPH IMPACTED GROUNDWATER
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8703-A10	DATE: 4-13-95	CHKD BY: JBK 5/31/95	REV DATE:	CHKD BY:



LEGEND

MW-22 ◆ MONITORING WELL LOCATION

PCE = TETRACHLOROETHENE
J = ESTIMATED VALUE
BDL = BELOW DETECTION LIMIT
NA = NOT AVAILABLE
NOTE: GROUNDWATER RESULTS ARE IN µg/L

SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

SCALE 0 200 400 FEET

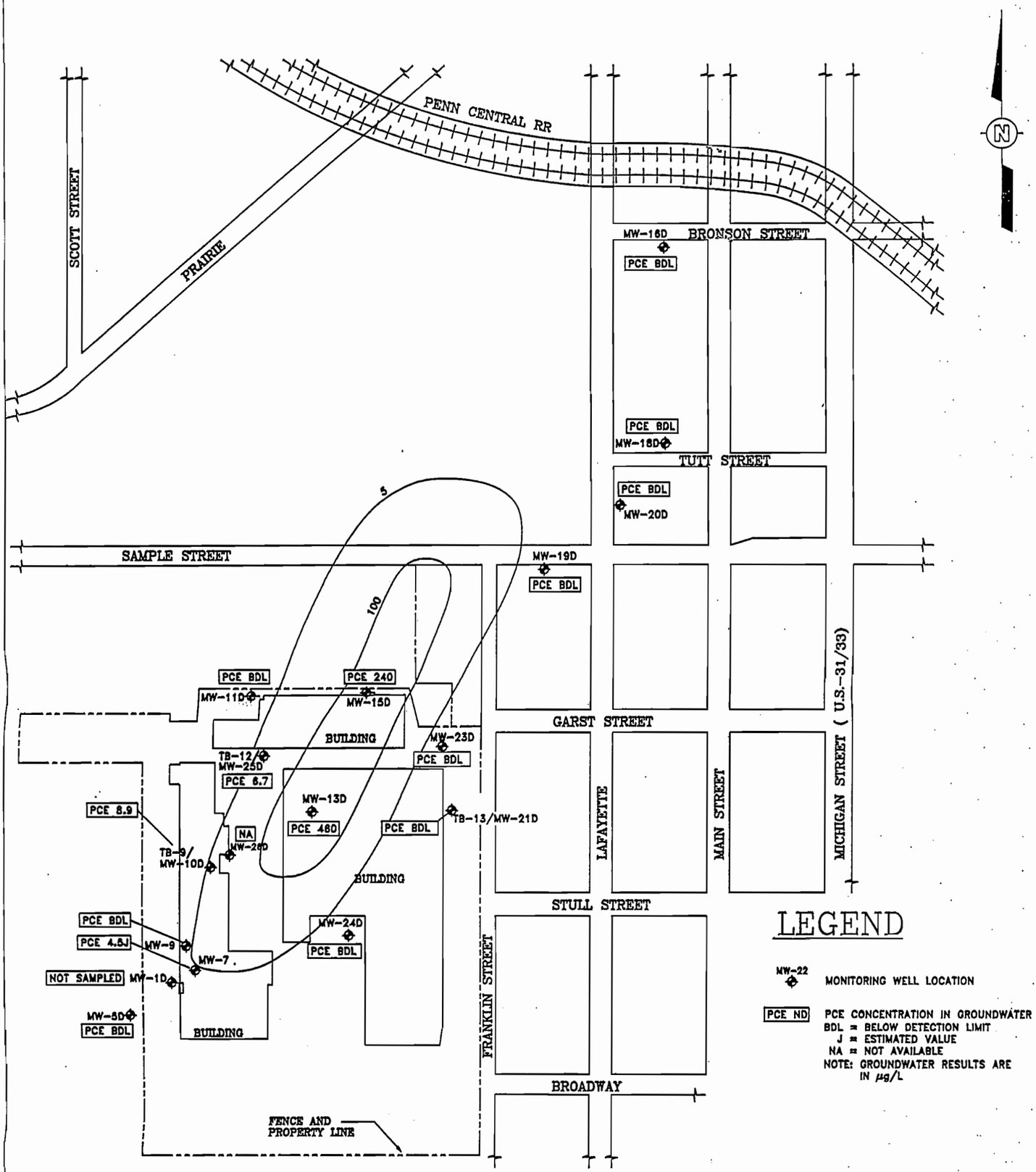
Figure 14

APT

PCE DISTRIBUTION IN GROUNDWATER - DEEP
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8703-A18	DATE: 3-16-95	CHKD BY: JEK 5/31/95	REV DATE:	CHKD BY:



LEGEND

MW-22 — MONITORING WELL LOCATION

PCE ND — PCE CONCENTRATION IN GROUNDWATER
BDL = BELOW DETECTION LIMIT
J = ESTIMATED VALUE
NA = NOT AVAILABLE
NOTE: GROUNDWATER RESULTS ARE IN µg/L

SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

SCALE
0 200 400 FEET

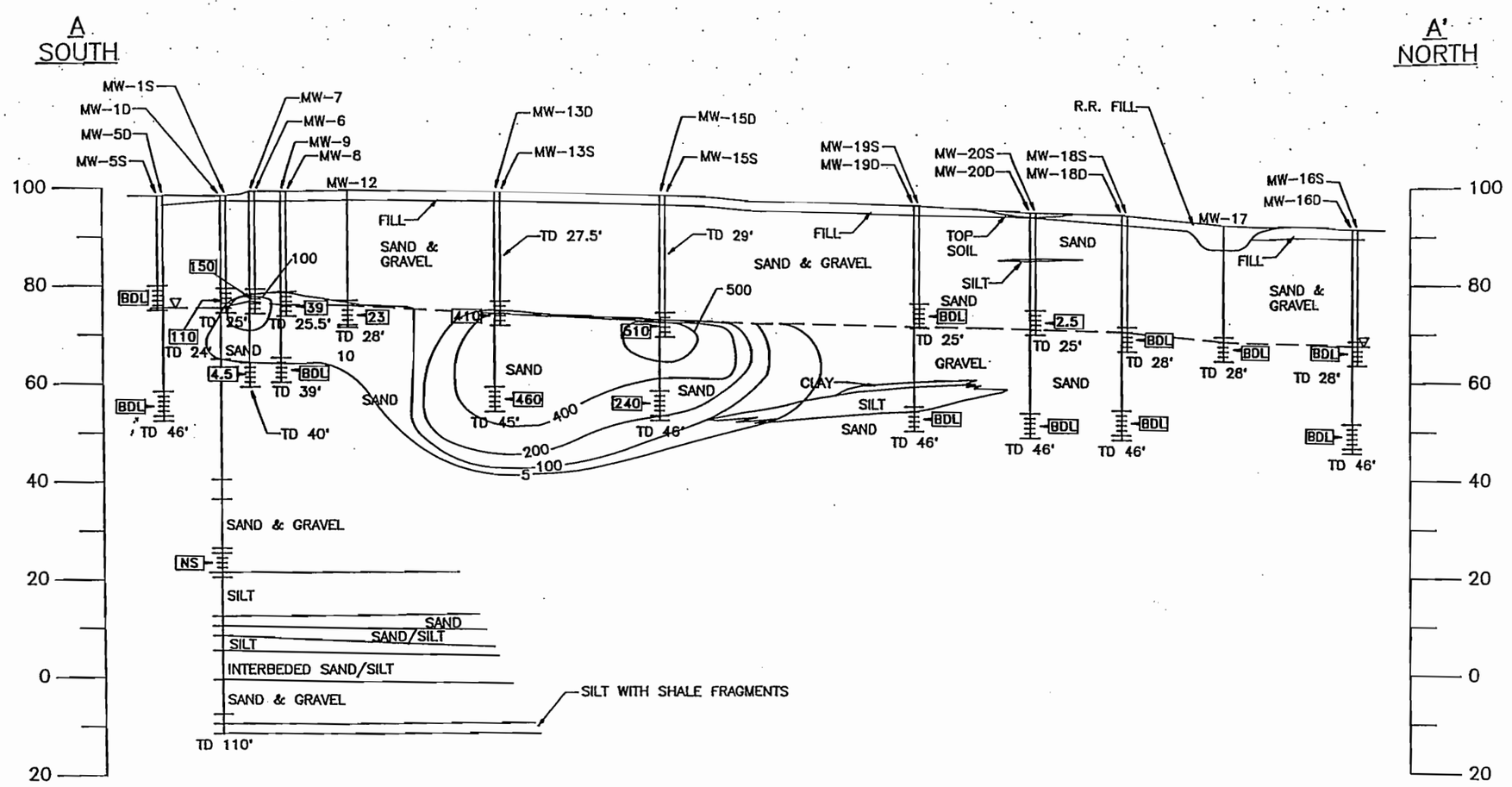
Figure 15

APT

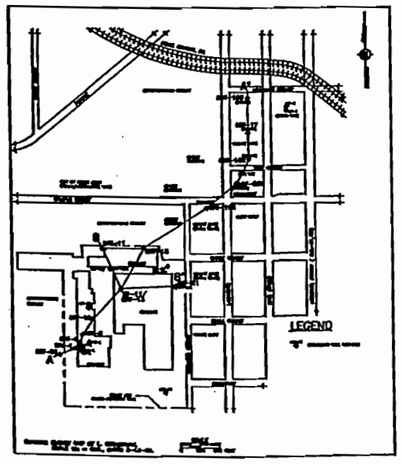
PCE DISTRIBUTION IN GROUNDWATER – DEEP
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8708-A03	DATE: 5-4-95	CHKD BY: JHK 5/31/95	REV DATE:	CHKD BY:



KEY MAP



LEGEND

SCREENED INTERVAL

460 PCE CONCENTRATION IN GROUNDWATER (µg/L)
BDL = BELOW DETECTION LIMIT
NS = NOT SAMPLED

NOTE: ELEVATIONS WERE MEASURED FROM TEMPORARY BENCH MARK (100.00).

SCALE
0 200 400 FEET

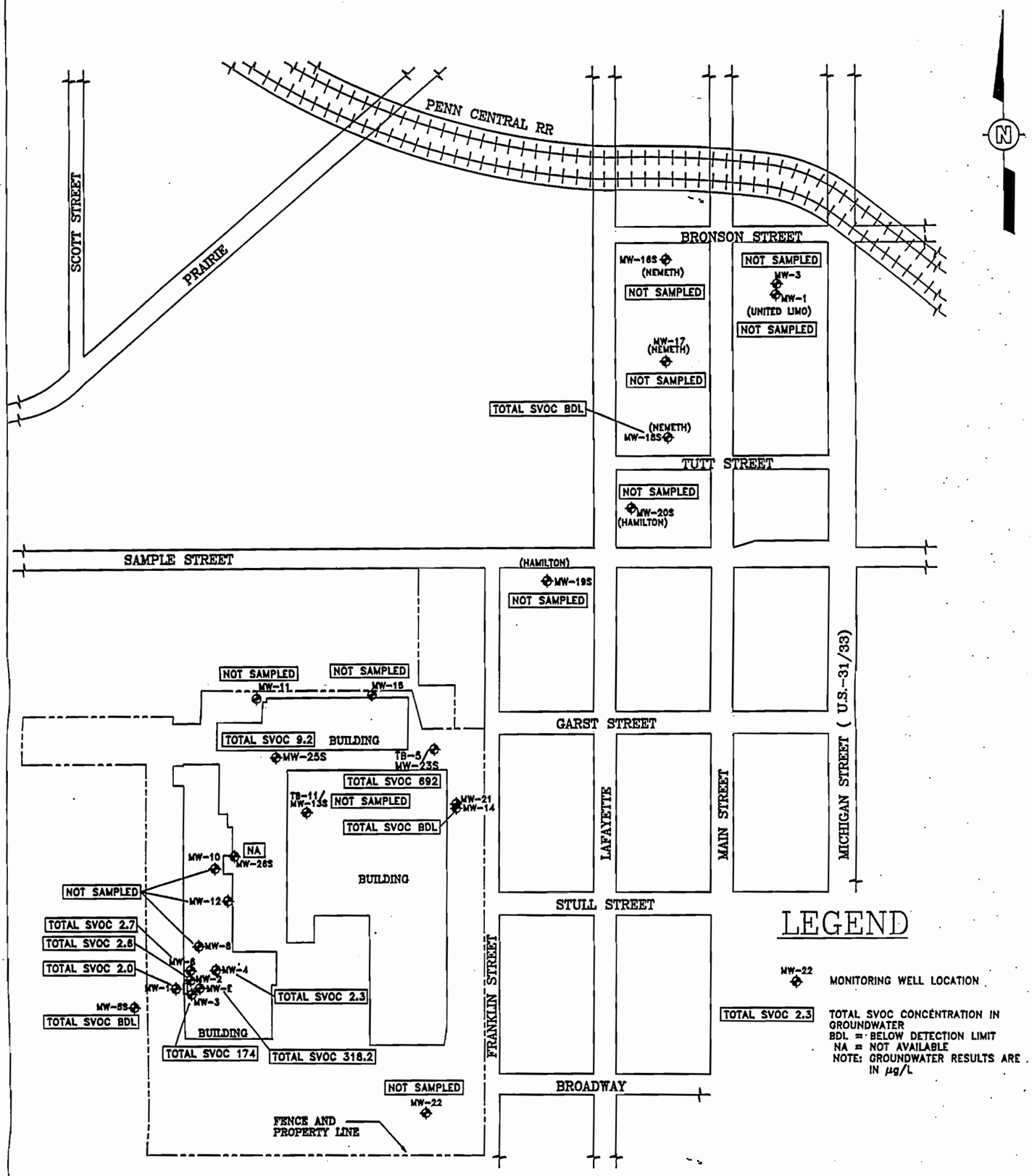
Figure 16

APT

NORTH – SOUTH
CROSS-SECTION A – A'
PCE IMPACTED GROUNDWATER
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8703-A17	DATE: 3-16-95	CHKD BY: JRL 3/16/95	REV DATE:	CHKD BY:



SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

SCALE
0 200 400 FEET

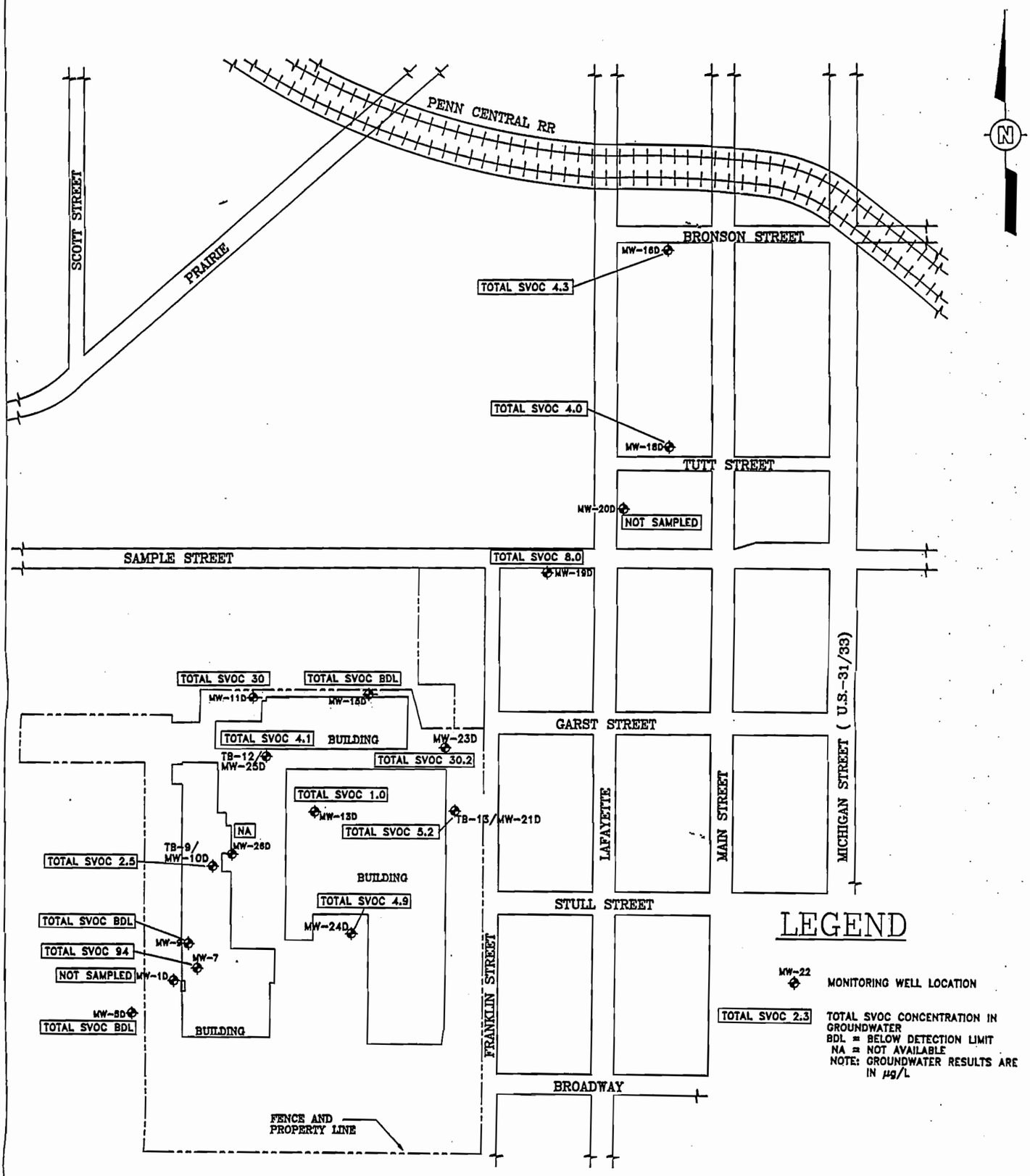
Figure 17

APT

TOTAL SVOC IN GROUNDWATER – SHALLOW
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8703-A19	DATE: 3-16-95	CHKD BY: JHL 5/31/95	REV DATE:	CHKD BY:



SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-86.

SCALE
0 200 400 FEET

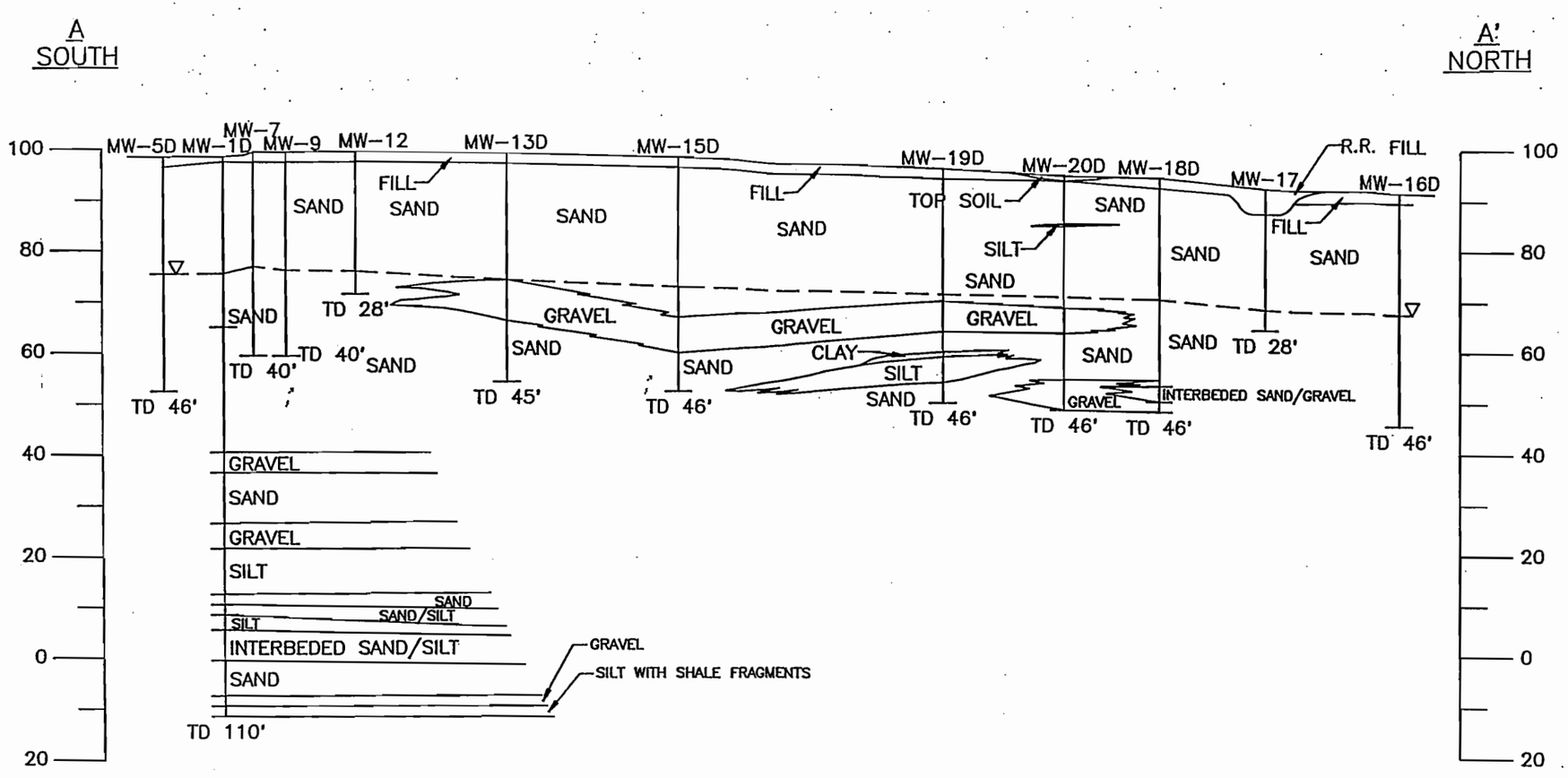
Figure 18

APT

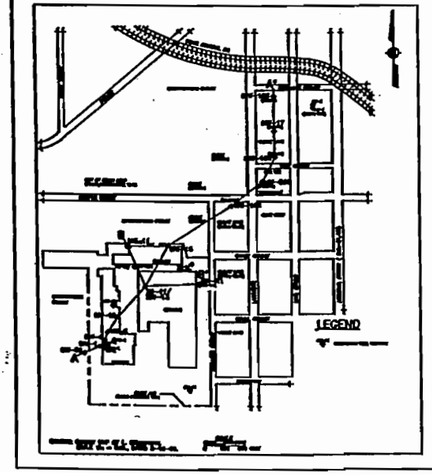
TOTAL SVOC IN GROUNDWATER – DEEP
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8708-A01	DATE: 4-28-95	CHKD BY: JAC 5/31/95	REV. DATE:	CHKD BY:



KEY MAP



NOTE: ELEVATIONS WERE MEASURED FROM TEMPORARY BENCH MARK (100.00).

SCALE
0 200 400 FEET

Figure 19
NORTH – SOUTH
STRATIGRAPHIC
CROSS-SECTION A – A'
ALLIED PRODUCTS
SOUTH BEND, INDIANA

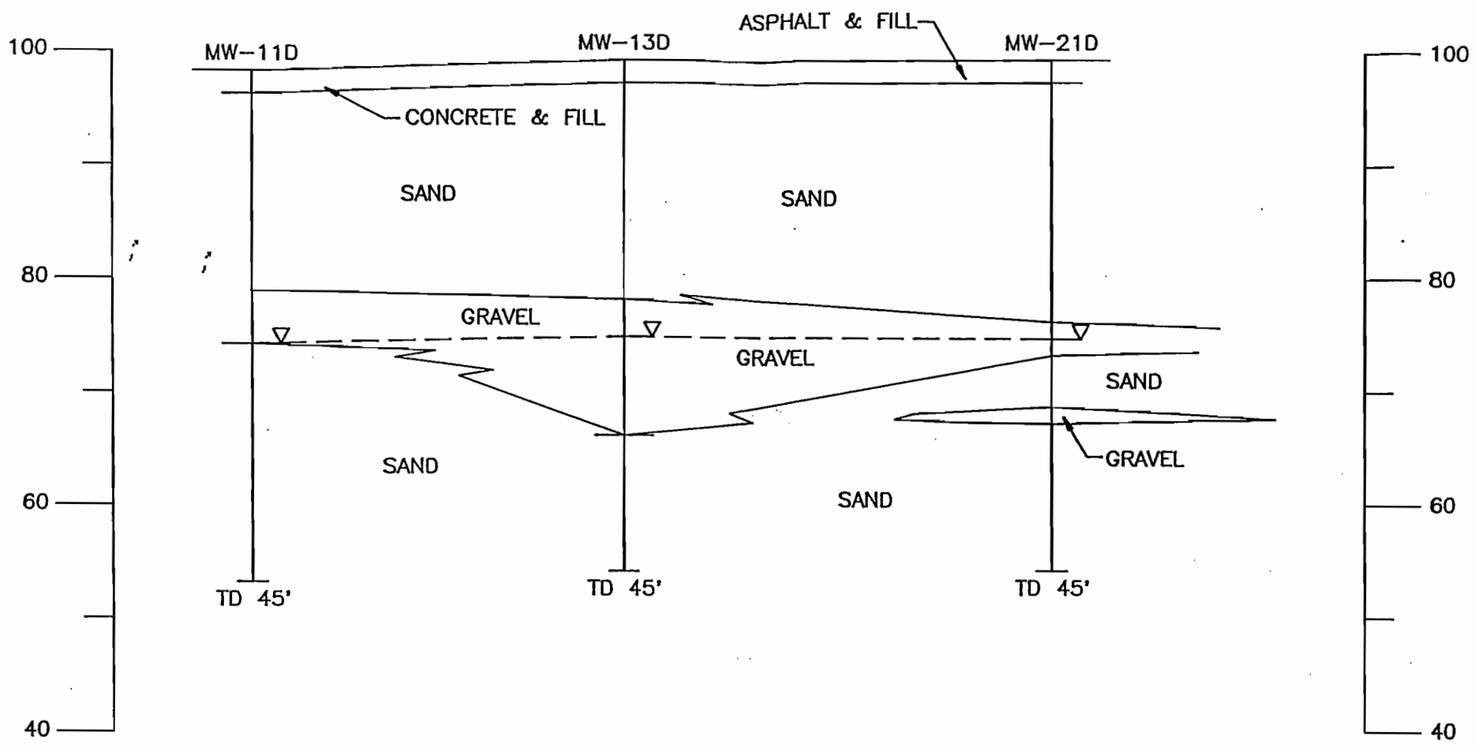
PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

APT

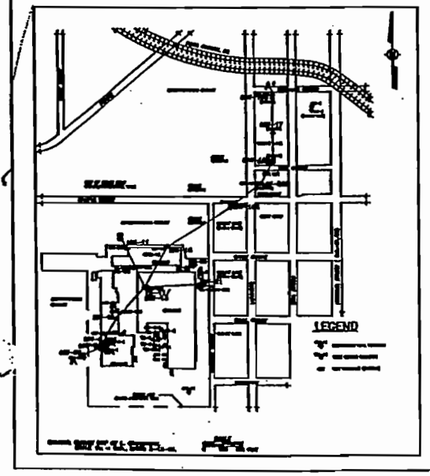
DWG: 8708-A02	DATE: 4-24-95	CHKD BY:	REV DATE:	CHKD BY:

B
WEST

B'
EAST



KEY MAP



NOTE: ELEVATIONS WERE MEASURED FROM TEMPORARY BENCH MARK (100.00).

SCALE
0 100 200 FEET

Figure 20

APT

EAST – WEST
STRATIGRAPHIC
CROSS-SECTION B – B'
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

TABLE 1
SOIL ANALYTICAL DATA SUMMARY - TPH
UST CLOSURE SAMPLING (March 9-10, 1994)
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

LOCATION	TPH - diesel (mg/kg)
T2-SSE	ND (1,000)
T2-SSW	ND (50)
T2-SS	ND (100)
T2-WE	ND (10)
T2-BE	ND (1,000)
T2-BW	ND (100)
T4-SSE	[illegible] (2,000)
T4-SSW	[illegible] (10)
T4-EE	ND (1,000)
T4-WE	[illegible] (10)
T4-BE	ND (4,000)
T4-BW	ND (1,000)
T3-NSW	ND (1,000)
T3-NSE	ND (2,000)
T3-EE	ND (5,000)
T3-WE	[illegible] (10)
T3-BE	ND (1,000)
T3-BW	ND (10)
T4-NSW	[illegible] (2,000)
T4-NSE	ND (5,000)
T1-SSW	ND (1,000)
T1-SSE	ND (1,000)
T1-NSW	ND (10)
T1-NSE	ND (100)
T1-EE	ND (100)
T1-WE	ND (100)
T1-BE	ND (1,000)
T1-BW	ND (2,000)

Notes: ND=Not Detected. Number in parentheses indicates nominal detection limit for analysis (mg/kg).
Sample I.D. consists of tank number (e.g., T1 = tank 1) and the location of the sample.
Location code examples are: BW=Bottom-West end; NSE=North Side-East end; EE=East End; etc.

TABLE 2 (CON'T)
SOIL ANALYTICAL DATA SUMMARY - VOCs
UST CLOSURE SAMPLING (March 9-10, 1994)
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	T1-SSW	T1-SSE	T1-NSW	T1-NSE	T1-EE
Acetone	ND (6,200)	[redacted] (6,200)	[redacted] (50)	ND (6,200)	[redacted] (500)
2-Butanone	ND (6,200)	ND (6,200)	ND (50)	ND (6,200)	ND (500)
Carbon disulfide	ND (620)	ND (620)	ND (5)	ND (620)	ND (50)
1,2-Dichloroethene, Total	ND (620)	ND (620)	ND (5)	ND (620)	ND (50)
Ethylbenzene	ND (620)	ND (620)	ND (5)	ND (620)	ND (50)
2-Hexanone	ND (6,200)	ND (6,200)	ND (50)	ND (6,200)	ND (500)
Methylene chloride	ND (620)	ND (620)	[redacted] (5)	ND (620)	[redacted] (50)
1,1,2,2-Tetrachloroethane	ND (620)	[redacted] (620)	ND (5)	ND (620)	ND (50)
Tetrachloroethene	[redacted] (620)	[redacted] (620)	[redacted] (5)	[redacted] (620)	[redacted] (50)
Toluene	ND (620)	ND (620)	ND (5)	ND (620)	ND (50)
Trichloroethene	ND (620)	ND (620)	ND (5)	ND (620)	ND (50)
Xylenes, Total	ND (620)	ND (620)	ND (5)	ND (620)	ND (50)

ANALYTE	T1-WE	T1-BE	T1-BW
Acetone	[redacted] (50)	ND (6,200)	ND (6,200)
2-Butanone	[redacted] (50)	ND (6,200)	ND (6,200)
Carbon disulfide	ND (5)	ND (620)	ND (620)
1,2-Dichloroethene, Total	ND (5)	ND (620)	ND (620)
Ethylbenzene	ND (5)	ND (620)	ND (620)
2-Hexanone	ND (50)	ND (6,200)	ND (6,200)
Methylene chloride	[redacted] (5)	ND (620)	ND (620)
1,1,2,2-Tetrachloroethane	ND (5)	ND (620)	ND (620)
Tetrachloroethene	[redacted] (5)	[redacted] (620)	[redacted] (620)
Toluene	ND (5)	ND (620)	ND (620)
Trichloroethene	ND (5)	ND (620)	ND (620)
Xylenes, Total	ND (5)	ND (620)	ND (620)

Note: All reported concentrations are µg/kg. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/kg).
J - Estimated value (detected), but below quantitation limit
B - Compound detected in method blank associated with this sample

TABLE 3 (CON'T)
SOIL ANALYTICAL DATA SUMMARY - SVOCs
UST CLOSURE SAMPLING (March 9-10, 1994)
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	T4-BE	T4-BW	T3-NSW	T3-NSE	T3-EE
Benzo (a) anthracene	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Benzo (a) pyrene	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Benzo (b) fluoranthene	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Benzo (ghi) perylene	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Benzo (k) fluoranthene	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Bis(2-ethylhexyl) phthalate	ND (20,000)	2,900 (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Carbazole	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Chrysene	ND (20,000)	ND (1,300)	ND (1,700)	930 J (6,700)	670 J (3,300)
Di-n-butyl phthalate	ND (20,000)	380 BJ (1,300)	480 BJ (1,700)	ND (6,700)	ND (3,300)
Diethyl phthalate	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Di-n-octyl phthalate	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Fluoranthene	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Indeno (1,2,3-cd) pyrene	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
2-Methylnaphalene	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Naphthalene	ND (20,000)	ND (1,300)	ND (1,700)	ND (6,700)	ND (3,300)
Phenathrene	ND (20,000)	ND (1,300)	ND (1,700)	1,400 J (6,700)	1,400 J (3,300)
Pyrene	ND (20,000)	ND (1,300)	ND (1,700)	670 J (6,700)	410 J (3,300)

ANALYTE	T3-WE	T3-BE	T3-BW	T4-NSW	T4-NSE
Benzo (a) anthracene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Benzo (a) pyrene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Benzo (b) fluoranthene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Benzo (ghi) perylene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Benzo (k) fluoranthene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Bis(2-ethylhexyl) phthalate	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Carbazole	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Chrysene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Di-n-butyl phthalate	230 BJ (330)	360 BJ (3,300)	37 J (330)	ND (3,300)	ND (3,300)
Diethyl phthalate	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Di-n-octyl phthalate	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Fluoranthene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Indeno (1,2,3-cd) pyrene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
2-Methylnaphalene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Naphthalene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)
Phenathrene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	480 J (3,300)
Pyrene	ND (330)	ND (3,300)	ND (330)	ND (3,300)	ND (3,300)

Note: All reported concentrations are µg/kg. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/kg).

J - Estimated value (detected), but below quantitation limit

B - Compound detected in method blank associated with this sample

TABLE 3 (CON'T)
SOIL ANALYTICAL DATA SUMMARY - SVOCs
UST CLOSURE SAMPLING (March 9-10, 1994)
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	T1-SSW	T1-SSE	T1-NSW	T1-NSE	T1-EE
Benzo (a) anthracene	ND (1,300)	ND (1,300)	ND (330)	ND (1,300)	ND (1,300)
Benzo (a) pyrene	ND (1,300)	ND (1,300)	59 J (330)	ND (1,300)	ND (1,300)
Benzo (b) fluoranthene	ND (1,300)	ND (1,300)	94 J (330)	ND (1,300)	ND (1,300)
Benzo (ghi) perylene	ND (1,300)	ND (1,300)	55 J (330)	ND (1,300)	ND (1,300)
Benzo (k) fluoranthene	ND (1,300)	ND (1,300)	53 J (330)	ND (1,300)	ND (1,300)
Bis(2-ethylhexyl) phthalate	ND (1,300)	ND (1,300)	ND (330)	ND (1,300)	ND (1,300)
Carbazole	ND (1,300)	ND (1,300)	35 J (330)	ND (1,300)	ND (1,300)
Chrysene	ND (1,300)	ND (1,300)	80 J (330)	ND (1,300)	ND (1,300)
Di-n-butyl phthalate	ND (1,300)	ND (1,300)	130 J (330)	260 J (1,300)	260 J (1,300)
Diethyl phthalate	ND (1,300)	ND (1,300)	ND (330)	ND (1,300)	ND (1,300)
Di-n-octyl phthalate	ND (1,300)	ND (1,300)	ND (330)	ND (1,300)	ND (1,300)
Fluoranthene	ND (1,300)	ND (1,300)	160 J (330)	ND (1,300)	ND (1,300)
Indeno (1,2,3-cd) pyrene	ND (1,300)	ND (1,300)	33 J (330)	ND (1,300)	ND (1,300)
2-Methylnaphalene	ND (1,300)	ND (1,300)	ND (330)	ND (1,300)	ND (1,300)
Naphthalene	ND (1,300)	ND (1,300)	ND (330)	ND (1,300)	ND (1,300)
Phenathrene	ND (1,300)	ND (1,300)	87 J (330)	ND (1,300)	ND (1,300)
Pyrene	ND (1,300)	ND (1,300)	120 J (330)	ND (1,300)	ND (1,300)

ANALYTE	T1-WE	T1-BE	T1-BW
Benzo (a) anthracene	ND (330)	ND (1,300)	ND (1,300)
Benzo (a) pyrene	ND (330)	ND (1,300)	ND (1,300)
Benzo (b) fluoranthene	ND (330)	ND (1,300)	ND (1,300)
Benzo (ghi) perylene	ND (330)	ND (1,300)	ND (1,300)
Benzo (k) fluoranthene	ND (330)	ND (1,300)	ND (1,300)
Bis(2-ethylhexyl) phthalate	ND (330)	ND (1,300)	610 J (1,300)
Carbazole	ND (330)	ND (1,300)	ND (1,300)
Chrysene	ND (330)	ND (1,300)	ND (1,300)
Di-n-butyl phthalate	270 J (330)	ND (1,300)	180 J (1,300)
Diethyl phthalate	ND (330)	ND (1,300)	ND (1,300)
Di-n-octyl phthalate	ND (330)	ND (1,300)	ND (1,300)
Fluoranthene	ND (330)	ND (1,300)	ND (1,300)
Indeno (1,2,3-cd) pyrene	ND (330)	ND (1,300)	ND (1,300)
2-Methylnaphalene	ND (330)	ND (1,300)	ND (1,300)
Naphthalene	ND (330)	ND (1,300)	ND (1,300)
Phenathrene	ND (330)	ND (1,300)	ND (1,300)
Pyrene	ND (330)	ND (1,300)	ND (1,3C0)

Note: All reported concentrations are µg/kg. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/kg).

J - Estimated value (detected), but below quantitation limit

B - Compound detected in method blank associated with this sample

TABLE 4 (CON'T)
FIELD SCREENING - PHOTOIONIZATION DETECTOR
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

DEPTH	MW-11	MW-12	MW-13	MW-13	MW-15	MW-15	MW-16	MW-16	MW-17	MW-18	MW-19	MW-20	MW-21	MW-23D
6"	—	—	ND	ND	—	—	—	—	ND	ND	ND	ND	—	ND
12"	—	—	ND	ND	—	—	—	—	ND	ND	ND	ND	ND	ND
18"	—	—	ND	ND	—	—	—	—	ND	ND	ND	ND	ND	ND
24"	—	—	ND	ND	—	—	—	—	ND	ND	ND	ND	ND	ND
30"	ND	ND	ND	ND	ND	—	—	—	ND	ND	ND	ND	ND	ND
36"	ND	ND	ND	ND	ND	—	—	—	ND	ND	ND	ND	ND	ND
42"	ND	ND	ND	ND	ND	—	12	12	ND	ND	ND	ND	ND	ND
48"	ND	ND	ND	ND	ND	—	12	12	ND	ND	ND	ND	ND	ND
54"	ND	ND	ND	ND	ND	—	14	14	96	—	ND	ND	ND	ND
60"	ND	ND	ND	ND	ND	—	ND	ND	114	—	ND	ND	ND	ND
66"	ND	ND	ND	ND	ND	—	ND	ND	ND	—	ND	ND	ND	ND
72"	ND	ND	ND	ND	ND	—	ND	ND	ND	—	ND	ND	ND	ND
78"	ND	ND	ND	ND	ND	—	ND	ND	ND	—	ND	ND	ND	ND
84"	ND	ND	ND	ND	ND	—	ND	ND	ND	—	ND	ND	ND	ND
90"	ND	ND	ND	ND	ND	—	ND	ND	ND	—	ND	ND	ND	ND
96"	ND	ND	ND	ND	ND	—	ND	ND	ND	—	ND	ND	ND	ND
102"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
108"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
114"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
120"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
126"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
132"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
138"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
144"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
150"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
156"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
162"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
168"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
174"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
180"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
186"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
192"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
198"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
204"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
210"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
216"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
222"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
228"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
234"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
240"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
246"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
252"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
258"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
264"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
270"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
276"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
282"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
288"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
294"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
300"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
306"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
312"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
318"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
324"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
330"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
336"	ND	ND	ND	ND	ND	—	ND	ND	ND	ND	ND	ND	ND	ND
342"	ND	—	—	ND	ND	—	ND	ND	—	ND	ND	ND	ND	ND
348"	ND	—	—	ND	ND	—	ND	ND	—	ND	ND	ND	ND	ND
354"	ND	—	—	ND	ND	—	ND	ND	—	ND	ND	ND	ND	ND
360"	ND	—	—	ND	ND	—	ND	ND	—	ND	ND	ND	ND	ND
366"	ND	—	—	ND	—	ND	—	ND	—	ND	ND	ND	ND	ND
372"	ND	—	—	ND	—	ND	—	ND	—	ND	ND	ND	ND	ND
378"	ND	—	—	ND	—	ND	—	ND	—	ND	ND	ND	ND	ND
384"	ND	—	—	ND	—	ND	—	ND	—	ND	ND	ND	ND	ND
390"	ND	—	—	ND	—	ND	—	ND	—	ND	ND	ND	ND	ND
396"	ND	—	—	ND	—	ND	—	ND	—	ND	ND	ND	ND	ND
402"	ND	—	—	ND	—	ND	—	ND	—	ND	ND	ND	ND	ND
408"	ND	—	—	ND	—	ND	—	ND	—	ND	ND	ND	ND	ND
414"	ND	—	—	ND	—	ND	—	ND	—	—	ND	ND	ND	ND
420"	ND	—	—	ND	—	ND	—	ND	—	—	ND	ND	ND	ND
426"	ND	—	—	ND	—	ND	—	ND	—	—	ND	ND	ND	ND
432"	ND	—	—	ND	—	ND	—	ND	—	—	ND	ND	ND	ND
438"	ND	—	—	ND	—	ND	—	ND	—	—	ND	ND	ND	ND
444"	ND	—	—	ND	—	ND	—	ND	—	—	ND	ND	ND	ND
450"	ND	—	—	ND	—	ND	—	ND	—	—	ND	ND	ND	ND
456"	ND	—	—	ND	—	ND	—	ND	—	—	ND	ND	ND	ND
462"	ND	—	—	ND	—	400	—	ND	—	—	ND	ND	ND	ND
468"	ND	—	—	ND	—	488	—	ND	—	—	ND	ND	ND	ND
474"	ND	—	—	ND	—	488	—	ND	—	—	ND	ND	ND	ND
480"	ND	—	—	ND	—	1000+	—	ND	—	—	ND	15	ND	ND
486"	ND	—	—	ND	—	71,000+	—	ND	—	—	ND	216	ND	ND
492"	ND	—	—	ND	—	71,000+	—	ND	—	—	ND	347	ND	ND
498"	ND	—	—	ND	—	71,000+	—	ND	—	—	ND	334	ND	ND
504"	ND	—	—	ND	—	71,000+	—	ND	—	—	ND	338	ND	ND
510"	ND	—	—	ND	—	705	—	ND	—	—	ND	77	ND	ND
516"	ND	—	—	ND	—	705	—	ND	—	—	ND	107	ND	ND
522"	ND	—	—	ND	—	705	—	ND	—	—	ND	ND	ND	ND
528"	ND	—	—	ND	—	705	—	ND	—	—	ND	ND	ND	ND
534"	—	—	—	—	—	77	—	ND	—	—	ND	—	—	—
540"	—	—	—	—	—	77	—	ND	—	—	ND	—	—	—
546"	—	—	—	—	—	33	—	—	—	—	ND	—	—	—
552"	—	—	—	—	—	33	—	—	—	—	ND	—	—	—

ND = Not Detected

— = No Sample

All PID measurements are in parts per million (ppm).

PID measurements were not obtained from monitor well borings MW-14, MW-16S, MW-19S, MW-20S, MW-21S, MW-22, MW-23S, and MW25S as there were [illegible] collected from the companion well at each of these well cluster locations.

TABLE 5
SAMPLING AND ANALYSIS SUMMARY
SAMPLE CONTAINER REQUIREMENTS, HOLDING TIMES,
PRESERVATION, AND ANALYTICAL PROCEDURES
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

Sample Type	Number of Samples	Sample Analysis	Sample Container	Preservation	Analysis Method	Holding Times[1]	Detection Limit
Soil Grab Sample	47	Volatile Organic Compounds	4 oz. glass with Teflon lined cap	Cool to 4° C	SW-846 Method 8240	14 Days Analyze	40 CFR 264, Appendix IX
	73	Semi-Volatile Organic Compounds	4 oz. glass with Teflon lined cap	Cool to 4° C	SW-846 Method 8270	14 Days Extraction 40 Days Post-Extraction Analyze	40 CFR 264, Appendix IX
	71	Total Petroleum Hydrocarbons	4 oz. glass with Teflon lined cap	Cool to 4° C	SW-846 Methods 8015	14 Days Extraction 40 Days Post-Extraction Analyze	40 CFR 264, Appendix IX
Groundwater Samples	43	Volatile Organic Compounds	40 ml glass vials w/ Teflon lined cap	HCl to pH<2, Cool to 4° C	SW-846 Method 8240	14 Days Analyze	40 CFR 264, Appendix IX
	26	Semi-Volatile Organic Compounds	1-liter amber glass w/ Teflon lined cap	Cool to 4° C	SW-846 Method 8270	7 Days Extraction 40 Days Post-Extraction Analyze	40 CFR 264, Appendix IX
	34	Total Petroleum Hydrocarbons	1-liter amber glass w/ Teflon lined cap	Cool to 4° C	SW-846 Methods 8015	7 Days Extraction 40 Days Post-Extraction Analyze	40 CFR 264, Appendix IX

[1] Holding time begins at time of sample collection.

TABLE 6 (CON'T)
SAMPLING AND ANALYSIS SUMMARY
SAMPLE NUMBERS, LOCATIONS, ANALYSES
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

		Soil			Aqueous		
Sample Identification	Date	Method 8240 VOCs	Method 8270 SVOCs	Method 8015 TPH	Method 8240 VOCs	Method 8270 SVOCs	Method 8015 TPH
MW-16S	9-1-94	--	--	--	1	--	--
MW-16D	9-1-94	--	--	--	1	--	--
MW-16D	10-31-94	--	--	--	--	1	1
MW-17S	9-1-94	--	--	--	1	--	--
MW-18S	10-14-94	--	--	--	1	1	--
MW-18D	10-14-94	--	--	--	1	1	--
MW-18D	10-31-94	--	--	--	1	1	1
MW-19D	10-31-94	--	--	--	1	1	1
MW-19S	10-31-94	--	--	--	1	--	--
MW-20S	11-3-94	--	--	--	1	--	--
MW-20D	11-3-94	--	--	--	1	--	1
MW-21	11-21-94	--	--	--	1	--	--
MW-21S	3-23-95	--	--	--	--	--	1
MW-21D	2-23-95	--	--	--	1	1	1
MW-22	3-24-95	--	--	--	--	--	1
MW-22S	4-6-95	--	--	--	--	--	1
MW-22	4-19-95	--	--	--	--	--	1
MW-23S	4-6-95	--	--	--	--	--	1
MW-23S	4-11-95	--	--	--	1	1	--
MW-23D	2-23-95	--	--	--	1	1	1
MW-24D	2-23-95	--	--	--	1	1	1
MW-25S	2-23-95	--	--	--	1	1	1
MW-25D	2-23-95	--	--	--	1	1	1
M-3	4-4-94	--	--	--	1	--	--
WW-1	6-17-94	--	--	--	1	--	--
WW-2	6-17-94	--	--	--	1	--	--
WW-3	6-17-94	--	--	--	1	--	--
TOTALS		47	73	71	43	26	34

TABLE 6 (CON'T)
SAMPLING AND ANALYSIS SUMMARY
SAMPLE NUMBERS, LOCATIONS, ANALYSES
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

		Soil			Aqueous		
Sample Identification	Date	Method 8240 VOCs	Method 8270 SVOCs	Method 8015 TPH	Method 8240 VOCs	Method 8270 SVOCs	Method 8015 TPH
TB4-12	2-10-95	--	1	1	--	--	--
TB4-24	2-10-95	--	1	1	--	--	--
TB5-11	2-7-95	--	1	1	--	--	--
TB5-24	2-7-95	--	1	1	--	--	--
TB6-12	2-7-95	--	1	1	--	--	--
TB6-25	2-7-95	--	1	1	--	--	--
TB7-12	2-9-95	--	1	1	--	--	--
TB7-25	2-9-95	--	1	1	--	--	--
TB8-12	2-9-95	--	1	1	--	--	--
TB8-24.5	2-9-95	--	1	1	--	--	--
TB10-40	2-27-95	--	1	1	--	--	--
TB14-18	2-9-95	--	1	1	--	--	--
TB14-26	2-9-95	--	1	1	--	--	--
T2-SSE	3-10-94	1	1	1	--	--	--
T2-SSW	3-10-94	1	1	1	--	--	--
T2-EE	3-10-94	1	1	1	--	--	--
T2-WE	3-10-94	1	1	1	--	--	--
T2-BE	3-10-94	1	1	1	--	--	--
T2-BW	3-10-94	1	1	1	--	--	--
T4-SSE	3-9-94	1	1	1	--	--	--
T4-SSW	3-9-94	1	1	1	--	--	--
T4-EE	3-9-94	1	1	1	--	--	--
T4-WE	3-9-94	1	1	1	--	--	--
T4-BE	3-9-94	1	1	1	--	--	--
T4-BW	3-9-94	1	1	1	--	--	--
T3-NSW	3-9-94	1	1	1	--	--	--
T3-NSE	3-9-94	1	1	1	--	--	--
T3-EE	3-9-94	1	1	1	--	--	--
T3-WE	3-9-94	1	1	1	--	--	--
T3-BE	3-9-94	1	1	1	--	--	--
T3-BW	3-9-94	1	1	1	--	--	--
T3-SSW, T4-NSW	3-9-94	1	1	1	--	--	--
T3-SSE, T4-NSE	3-9-94	1	1	1	--	--	--
T1-SSW, T2-NSW	3-10-94	1	1	1	--	--	--
T1-SSE, T2-NSE	3-10-94	1	1	1	--	--	--
T1-NSW	3-10-94	1	1	1	--	--	--
T1-NSE	3-10-94	1	1	1	--	--	--
T1-EE	3-10-94	1	1	1	--	--	--
T1-WE	3-10-94	1	1	1	--	--	--
T1-BE	3-10-94	1	1	1	--	--	--
T1-BW	3-10-94	1	1	1	--	--	--

TABLE 7 (CON'T)
SOIL ANALYTICAL DATA SUMMARY - TPH
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	TB1-24.5	TB2-12	TB2-24	TB3-12	TB3-24
Date Sampled	2-10-95	2-10-95	2-10-95	2-10-95	2-10-95
TPH (gasoline)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
TPH (diesel)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
TPH (motor oil)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
TPH (unknown)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)

ANALYTE	TB4-12	TB4-24	TB5-11	TB5-24	TB6-12
Date Sampled	2-10-95	2-10-95	2-7-95	2-7-95	2-7-95
TPH (gasoline)	ND (10)	ND (10)	ND (10)	[redacted] (20)	ND (10)
TPH (diesel)	ND (10)	ND (10)	ND (10)	ND (20)	ND (10)
TPH (motor oil)	ND (10)	ND (10)	[redacted] (10)	ND (20)	ND (10)
TPH (unknown)	ND (10)	ND (10)	ND (10)	ND (20)	ND (10)

ANALYTE	TB6-25	TB7-12	TB7-25	TB8-12	TB8-24.5
Date Sampled	2-7-95	2-9-95	2-9-95	2-9-95	2-9-95
TPH (gasoline)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
TPH (diesel)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
TPH (motor oil)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
TPH (unknown)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)

ANALYTE	TB10-40	TB14-18	TB14-26
Date Sampled	2-27-95	2-9-95	2-9-95
TPH (gasoline)	ND (10)	ND (10)	ND (10)
TPH (diesel)	ND (10)	ND (10)	ND (10)
TPH (motor oil)	ND (10)	ND (10)	ND (10)
TPH (unknown)	ND (10)	ND (10)	ND (10)

Note: All reported concentrations are mg/kg. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (mg/kg)

TABLE 9 (CON'T)
SOIL ANALYTICAL DATA SUMMARY - SVOCs
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	MW23D-25	MW23D-43	MW24D-24	MW24D-43.5	MW25D-26
Date Sampled	2-9-95	2-9-95	2-8-95	2-8-95	2-21-95
Benzo (a) anthracene	ND (330)	ND (330)	ND (330)	ND (330)	510 J (330)
Benzo (a) pyrene	ND (330)	ND (330)	ND (330)	ND (330)	430 J (330)
Benzo (b) fluoranthene	ND (330)	ND (330)	ND (330)	ND (330)	510 J (330)
Benzo (ghi) perylene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (k) fluoranthene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Bis(2-ethylhexyl) phthalate	140 J (330)	69 J (330)	ND (330)	93 J (330)	45 J (330)
Chrysene	ND (330)	ND (330)	ND (330)	ND (330)	520 J (330)
Di-n-butyl phthalate	ND (330)	62 J (330)	130 J (330)	200 J (330)	320 BJ (330)
Di-n-octyl phthalate	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Fluoranthene	ND (330)	ND (330)	ND (330)	ND (330)	920 J (330)
Indeno (1,2,3-cd) pyrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
2-Methylnaphalene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Naphthalene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Phenathrene	ND (330)	ND (330)	ND (330)	ND (330)	790 J (330)
Pyrene	ND (330)	ND (330)	ND (330)	ND (330)	1100 J (330)

ANALYTE	MW25D-42	TB1-12	TB1-24.5	TB2-12	TB2-24
Date Sampled	2-21-95	2-10-95	2-10-95	2-10-95	2-10-95
Benzo (a) anthracene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (a) pyrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (b) fluoranthene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (ghi) perylene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (k) fluoranthene	ND (330)	41 J (330)	ND (330)	ND (330)	ND (330)
Bis(2-ethylhexyl) phthalate	ND (330)	120 J (330)	ND (330)	ND (330)	1000 (330)
Chrysene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Di-n-butyl phthalate	260 BJ (330)	ND (330)	ND (330)	ND (330)	ND (330)
Di-n-octyl phthalate	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Fluoranthene	56 J (330)	49 J (330)	ND (330)	ND (330)	ND (330)
Indeno (1,2,3-cd) pyrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
2-Methylnaphalene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Naphthalene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Phenathrene	50 J (330)	ND (330)	ND (330)	ND (330)	ND (330)
Pyrene	60 J (330)	ND (330)	ND (330)	ND (330)	ND (330)

Note: All reported concentrations are µg/kg. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/kg).

J - Estimated value (detected), but below quantitation limit

B - Compound detected in method blank associated with this sample

TABLE 9
SOIL ANALYTICAL DATA SUMMARY - SVOCs
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	MW1-21	MW1D-38	MW2-21	MW3-21	MW4-21
Date Sampled	11-1-93	10-28-94	11-2-93	11-3-93	11-11-93
Benzo (a) anthracene	ND (330)	ND (660)	ND (330)	ND (330)	ND (330)
Benzo (a) pyrene	ND (330)	ND (660)	690 J (330)	ND (330)	ND (330)
Benzo (b) fluoranthene	ND (330)	ND (660)	900 J (330)	ND (330)	ND (330)
Benzo (ghi) perylene	ND (330)	ND (660)	350 J (330)	ND (330)	ND (330)
Benzo (k) fluoranthene	ND (330)	ND (660)	ND (330)	ND (330)	ND (330)
Bis(2-ethylhexyl) phthalate	700 (330)	1,300 (660)	ND (330)	210 J (330)	1,100 (330)
Chrysene	ND (330)	ND (660)	ND (330)	ND (330)	ND (330)
Di-n-butyl phthalate	48 J (330)	ND (660)	110 J (330)	53 J (330)	140 J (330)
Di-n-octyl phthalate	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Fluoranthene	ND (330)	ND (660)	ND (330)	ND (330)	ND (330)
Indeno (1,2,3-cd) pyrene	ND (330)	ND (660)	370 J (330)	ND (330)	ND (330)
2-Methylnaphalene	ND (330)	ND (660)	ND (330)	ND (330)	ND (330)
Naphthalene	ND (330)	ND (660)	ND (330)	ND (330)	ND (330)
Phenathrene	ND (330)	ND (660)	ND (330)	ND (330)	ND (330)
Pyrene	ND (330)	ND (660)	2400 J (330)	ND (330)	ND (330)

ANALYTE	MW5-23.5	MW5D-42	MW6-21.5	MW7-40	MW10D-26
Date Sampled	11-15-93	10-17-94	11-29-93	11-30-93	2-22-95
Benzo (a) anthracene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (a) pyrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (b) fluoranthene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (ghi) perylene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (k) fluoranthene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Bis(2-ethylhexyl) phthalate	ND (330)	ND (330)	3,600 (330)	400 (330)	410 (330)
Chrysene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Di-n-butyl phthalate	130 J (330)	99 J (330)	320 J (330)	52 J (330)	ND (330)
Di-n-octyl phthalate	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Fluoranthene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Indeno (1,2,3-cd) pyrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
2-Methylnaphalene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Naphthalene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Phenathrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Pyrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)

Note: All reported concentrations are µg/kg. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/kg).

J - Estimated value (detected), but below quantitation limit

B - Compound detected in method blank associated with this sample

TABLE 9 (CON'T)
SOIL ANALYTICAL DATA SUMMARY - SVOCs
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	TB8-12	TB8-24.5	TB10-40	TB14-18	TB14-26
Date Sampled	2-9-95	2-9-95	2-27-95	2-9-95	2-9-95
Benzo (a) anthracene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (a) pyrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (b) fluoranthene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (ghi) perylene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Benzo (k) fluoranthene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Bis(2-ethylhexyl) phthalate	[redacted] (330)	[redacted] (330)	ND (330)	[redacted] (330)	[redacted] (330)
Chrysene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Di-n-butyl phthalate	[redacted] (330)	[redacted] (330)	ND (330)	[redacted] (330)	[redacted] (330)
Di-n-octyl phthalate	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Fluoranthene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Indeno (1,2,3-cd) pyrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
2-Methylnaphalene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Naphthalene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Phenathrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)
Pyrene	ND (330)	ND (330)	ND (330)	ND (330)	ND (330)

Note: All reported concentrations are µg/kg. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/kg).
J - Estimated value (detected), but below quantitation limit
B - Compound detected in method blank associated with this sample

TABLE 10 (CON'T)
GROUNDWATER ANALYTICAL DATA SUMMARY - TPH
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	MW16D-GW2	MW18D-GW2	MW19D-GW1	MW20D-GW1	MW-21S
Date Sampled	10-31-94	10-31-94	10-31-94	11-3-94	3-23-95
TPH (gasoline)	ND (25)	[redacted] (25)	ND (25)	[redacted] (27)	ND (100)
TPH (diesel)	ND (25)	ND (25)	ND (25)	ND (27)	ND (100)
TPH (motor oil)	ND (25)	ND (25)	ND (25)	ND (27)	ND (100)
TPH (unknown)	[redacted] (25)	ND (25)	ND (25)	ND (27)	ND (100)

ANALYTE	MW21D-GW1	MW-22	MW-22S	MW-22	MW-23S
Date Sampled	2-23-95	3-24-95	4-6-95	4-19-95	4-6-95
TPH (gasoline)	ND (100)	[redacted] (100)	[redacted] (100)	ND (100)	ND (2,100)
TPH (diesel)	ND (100)	ND (100)	ND (100)	ND (100)	ND (2,100)
TPH (motor oil)	ND (100)	[redacted] (100)	ND (100)	[redacted] (100)	ND (2,100)
TPH (unknown)	ND (100)	ND (100)	ND (100)	ND (100)	[redacted] (2,100)

ANALYTE	MW23D-GW1	MW24D-GW1	MW25-GW1	MW25D-GW1
Date Sampled	2-23-95	2-23-95	2-23-95	2-23-95
TPH (gasoline)	ND (100)	ND (100)	ND (100)	ND (100)
TPH (diesel)	ND (100)	ND (100)	ND (100)	ND (100)
TPH (motor oil)	ND (100)	ND (100)	ND (100)	ND (100)
TPH (unknown)	ND (100)	ND (100)	ND (100)	ND (100)

Note: All reported concentrations are µg/l. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/l).
J - Estimated value (detected), but below quantitation limit
B - Compound detected in method blank associated with this sample

TABLE 11 (CON'T)
GROUNDWATER ANALYTICAL DATA SUMMARY - VOCs
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	MW9-GW1	MW10-GW1	MW10D-GW1	MW11-GW1	MW11D-GW1
Date Sampled	1-31-94	1-31-94	2-23-95	1-31-94	2-23-95
Acetone	ND (50)	ND (50)	[redacted] (50)	ND (50)	ND (50)
2-Butanone	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
1,1-Dichloroethane	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
1,2-Dichloroethene,Total	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
cis-1,2,-Dichloroethene	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
trans-1,2,-Dichloroethene	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Ethylbenzene	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Methylene chloride	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Tetrachloroethene	ND (5)	[redacted] (5)	[redacted] (5)	ND (5)	ND (5)
Toluene	ND (5)	ND (5)	[redacted] (5)	ND (5)	ND (5)
1,1,1-Trichloroethane	ND (5)	ND (5)	[redacted] (5)	ND (5)	ND (5)
Trichloroethene	ND (5)	ND (5)	ND (5)	[redacted] (5)	[redacted] (5)
Vinyl Chloride	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Xylenes, Total	ND (5)	ND (5)	[redacted] (5)	ND (5)	ND (5)

ANALYTE	MW12-GW1	MW13-GW1	MW13D-GW1	MW14-GW1	MW15-GW1
Date Sampled	2-28-94	2-28-94	2-23-95	3-8-94	3-2-94
Acetone	ND (50)	ND (170)	ND (170)	ND (20)	ND (250)
2-Butanone	ND (50)	ND (170)	ND (170)	—	ND (250)
1,1-Dichloroethane	ND (5)	ND (17)	ND (17)	ND (1)	ND (25)
1,2-Dichloroethene,Total	[redacted] (5)	[redacted] (17)	ND (17)	—	ND (25)
cis-1,2,-Dichloroethene	—	—	ND (17)	—	ND (25)
trans-1,2,-Dichloroethene	—	—	ND (17)	—	ND (25)
Ethylbenzene	ND (5)	ND (17)	ND (17)	ND (1)	ND (25)
Methylene chloride	ND (5)	ND (17)	ND (17)	ND (10)	ND (25)
Tetrachloroethene	[redacted] (5)	[redacted] (17)	[redacted] (17)	ND (1)	[redacted] (25)
Toluene	ND (5)	ND (17)	ND (17)	ND (1)	ND (25)
1,1,1-Trichloroethane	ND (5)	ND (17)	ND (17)	ND (1)	ND (25)
Trichloroethene	ND (5)	[redacted] (17)	ND (17)	[redacted] (1)	[redacted] (25)
Vinyl Chloride	ND (10)	ND (33)	ND (33)	ND (2)	ND (50)
Xylenes, Total	ND (5)	ND (17)	ND (17)	ND (1)	ND (25)

Note: All reported concentrations are µg/l. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/l).

"——" = Not tested for specific isomers. A total value for the constituent was determined instead.

J - Estimated value (detected), but below quantitation limit

B - Compound detected in method blank associated with this sample

TABLE 11 (CON'T)
GROUNDWATER ANALYTICAL DATA SUMMARY - VOCs
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	MW20S-GW1	MW20D-GW1	MW21-GW1	MW21D-GW1	MW23S
Date Sampled	11-3-94	11-3-94	11-21-94	2-23-95	4-11-95
Acetone	ND (50)	ND (50)	ND (50)	ND (50)	ND (2,500)
2-Butanone	ND (50)	ND (50)	ND (50)	ND (50)	ND (2,500)
1,1-Dichloroethane	ND (5)	ND (5)	ND (5)	ND (5)	ND (250)
1,2-Dichloroethene,Total	ND (5)	ND (5)	ND (5)	ND (5)	ND (250)
cis-1,2,-Dichloroethene	ND (5)	ND (5)	ND (5)	ND (5)	ND (250)
trans-1,2,-Dichloroethene	ND (5)	ND (5)	ND (5)	ND (5)	ND (250)
Ethylbenzene	[redacted] (5)	ND (5)	ND (5)	ND (5)	ND (250)
Methylene chloride	ND (5)	ND (5)	ND (5)	ND (5)	ND (250)
Tetrachloroethene	[redacted] (5)	ND (5)	ND (5)	ND (5)	ND (250)
Toluene	[redacted] (5)	ND (5)	ND (5)	[redacted] (5)	ND (250)
1,1,1-Trichloroethane	ND (5)	[redacted] (5)	[redacted] (5)	[redacted] (5)	ND (250)
Trichloroethene	ND (5)	ND (5)	ND (5)	ND (5)	ND (250)
Vinyl Chloride	ND (10)	ND (10)	ND (10)	ND (10)	ND (500)
Xylenes, Total	[redacted] (5)	ND (5)	ND (5)	[redacted] (5)	[redacted] (250)

ANALYTE	MW23D-GW1	MW24D-GW1	MW25S-GW1	MW25D-GW1	M3-GW2
Date Sampled	2-23-95	2-23-95	2-23-95	2-23-95	4-4-94
Acetone	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
2-Butanone	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
1,1-Dichloroethane	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
1,2-Dichloroethene,Total	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
cis-1,2,-Dichloroethene	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
trans-1,2,-Dichloroethene	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Ethylbenzene	ND (5)	ND (5)	[redacted] (5)	ND (5)	ND (5)
Methylene chloride	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Tetrachloroethene	ND (5)	ND (5)	[redacted] (5)	[redacted] (5)	[redacted] (5)
Toluene	[redacted] (5)	[redacted] (5)	[redacted] (5)	[redacted] (5)	ND (5)
1,1,1-Trichloroethane	[redacted] (5)	[redacted] (5)	ND (5)	ND (5)	[redacted] (5)
Trichloroethene	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
Vinyl Chloride	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Xylenes, Total	[redacted] (5)	[redacted] (5)	[redacted] (5)	[redacted] (5)	ND (5)

Note: All reported concentrations are µg/l. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/l).

"——" = Not tested for specific isomers. A total value for the constituent was determined instead.

J - Estimated value (detected), but below quantitation limit

B - Compound detected in method blank associated with this sample

TABLE 12
GROUNDWATER ANALYTICAL DATA SUMMARY - SVOCs
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	MW-Exist	MW-1	MW-2	MW-3	MW-3
Date Sampled	11-5-93	11-4-93	11-4-93	11-4-93	12-1-93
2-Methylnaphthalene	ND (40)	ND (10)	ND (10)	ND (25)	ND (10)
Benzo(b) fluoranthene	ND (40)	ND (10)	ND (10)	[redacted] (25)	[redacted] (10)
Bis(2-ethylhexyl)phthalate	[redacted] (40)	[redacted] (10)	[redacted] (10)	[redacted] (25)	[redacted] (10)
Carbazole	ND (40)	ND (10)	ND (10)	ND (25)	ND (10)
Chrysene	[redacted] (40)	ND (10)	ND (10)	[redacted] (25)	[redacted] (10)
Di-n-butyl phthalate	ND (40)	ND (10)	ND (10)	ND (25)	ND (10)
Di-n-octyl phthalate	ND (40)	ND (10)	ND (10)	ND (25)	ND (10)
Diethylphthalate	ND (40)	ND (10)	ND (10)	ND (25)	ND (10)
Fluoranthene	ND (40)	ND (10)	ND (10)	[redacted] (25)	[redacted] (10)
Naphthalene	ND (40)	ND (10)	ND (10)	ND (25)	ND (10)
4-Nitrophenol	ND (40)	ND (10)	ND (10)	ND (25)	ND (10)
Pentachlorophenol	ND (200)	ND (50)	ND (50)	[redacted] (120)	ND (50)
Phenol	ND (40)	ND (10)	ND (10)	ND (25)	ND (10)
Pyrene	[redacted] (40)	ND (10)	ND (10)	[redacted] (25)	[redacted] (10)

ANALYTE	MW-4	MW-5	MW5D-GW1	MW-6	MW-7
Date Sampled	11-15-93	11-15-93	11-3-94	12-1-93	12-1-93
2-Methylnaphthalene	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)
Benzo(b) fluoranthene	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)
Bis(2-ethylhexyl)phthalate	[redacted] (10)	ND (10)	ND (10)	[redacted] (10)	[redacted] (20)
Carbazole	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)
Chrysene	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)
Di-n-butyl phthalate	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)
Di-n-octyl phthalate	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)
Diethylphthalate	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)
Fluoranthene	ND (10)	ND (10)	ND (10)	[redacted] (10)	ND (20)
Naphthalene	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)
4-Nitrophenol	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)
Pentachlorophenol	ND (50)	ND (50)	ND (10)	ND (50)	ND (100)
Phenol	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)
Pyrene	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)

Note: All reported concentrations are µg/l. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/l).
"——" = Not tested for analyte.
J - Estimated value (detected), but below quantitation limit

TABLE 12 (CON'T)
GROUNDWATER ANALYTICAL DATA SUMMARY - SVOCs
ALLIED PRODUCTS CORPORATION
SOUTH BEND, INDIANA

ANALYTE	MW21D-GW1	MW23S-GW1	MW23D-GW1	MW24D-GW1	MW25-GW1
Date Sampled	2-23-95	4-11-95	2-23-95	2-23-95	2-23-95
2-Methylnaphthalene	ND (10)	[redacted] (50)	ND (10)	ND (10)	ND (10)
Benzo(b) fluoranthene	---	---	---	---	---
Bis(2-ethylhexyl)phthalate	[redacted] (10)	ND (50)	[redacted] (10)	[redacted] (10)	[redacted] (10)
Carbazole	ND (10)	ND (50)	ND (10)	ND (10)	ND (10)
Chrysene	ND (10)	ND (50)	ND (10)	ND (10)	ND (10)
Di-n-butyl phthalate	[redacted] (10)	ND (50)	[redacted] (10)	[redacted] (10)	[redacted] (10)
Di-n-octyl phthalate	ND (10)	ND (50)	ND (10)	ND (10)	ND (10)
Diethylphthalate	ND (10)	ND (50)	ND (10)	ND (10)	ND (10)
Fluoranthene	ND (10)	ND (50)	ND (10)	ND (10)	ND (10)
Naphthalene	ND (10)	[redacted] (50)	[redacted] (10)	ND (10)	[redacted] (10)
4-Nitrophenol	ND (10)	[redacted] (50)	ND (10)	ND (10)	ND (10)
Pentachlorophenol	ND (10)	ND (250)	ND (50)	ND (50)	ND (50)
Phenol	ND (10)	ND (50)	ND (10)	ND (10)	ND (10)
Pyrene	ND (10)	ND (50)	ND (10)	ND (10)	ND (10)

ANALYTE	MW25D-GW1
Date Sampled	2-23-95
2-Methylnaphthalene	ND (10)
Benzo(b) fluoranthene	---
Bis(2-ethylhexyl)phthalate	[redacted] (10)
Carbazole	ND (10)
Chrysene	ND (10)
Di-n-butyl phthalate	[redacted] (10)
Di-n-octyl phthalate	ND (10)
Diethylphthalate	ND (10)
Fluoranthene	ND (10)
Naphthalene	[redacted] (10)
4-Nitrophenol	ND (10)
Pentachlorophenol	ND (10)
Phenol	ND (10)
Pyrene	ND (10)

Note: All reported concentrations are µg/l. ND = Not Detected. Number in parentheses indicates nominal detection limit for analysis (µg/l).
"---" = Not tested for analyte.
J - Estimated value (detected), but below quantitation limit

WG: BORDER-L	DATE: 5-2-95	CHKD BY:	REV DATE:	CHKD BY:	REV DATE:	CHKD BY:

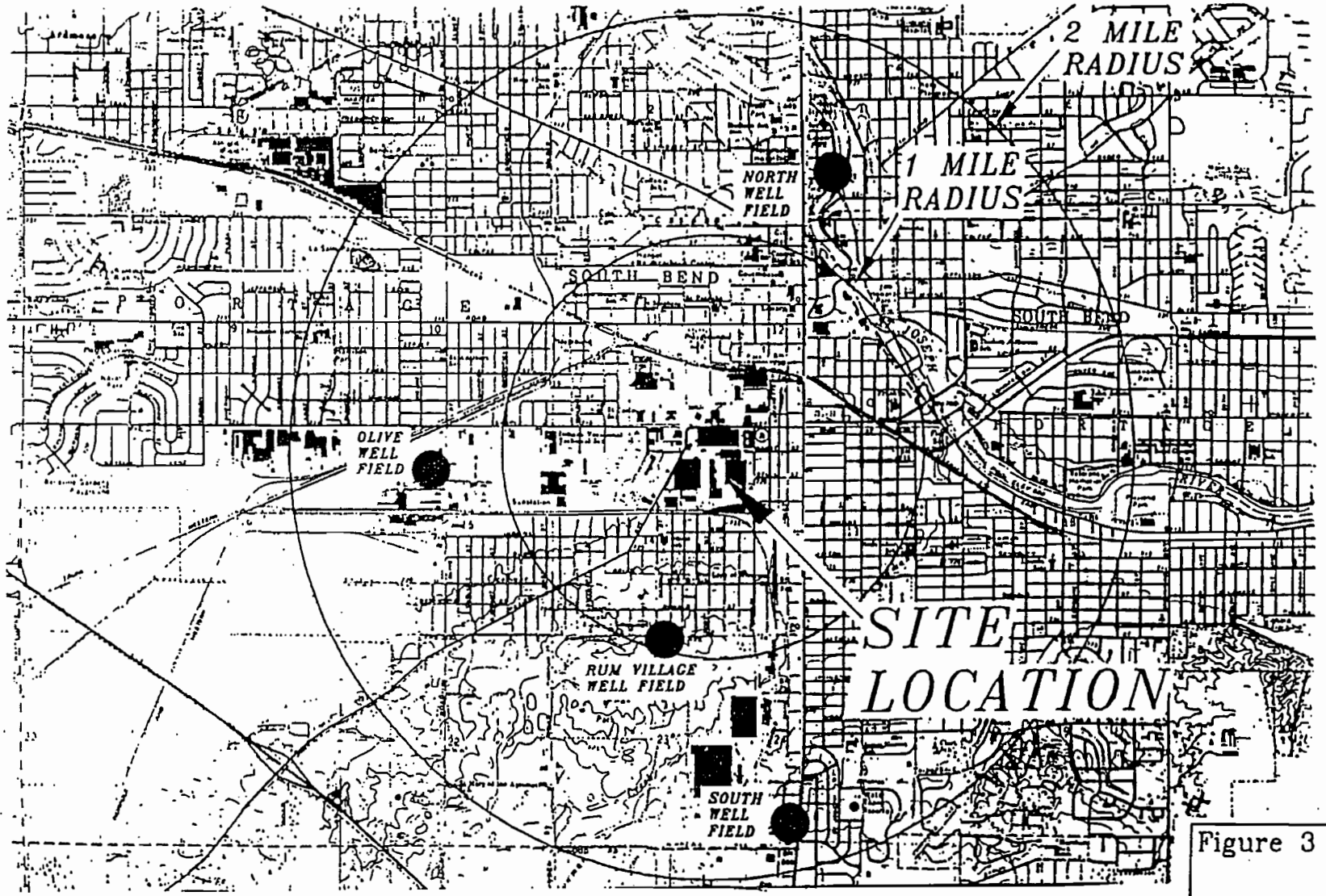
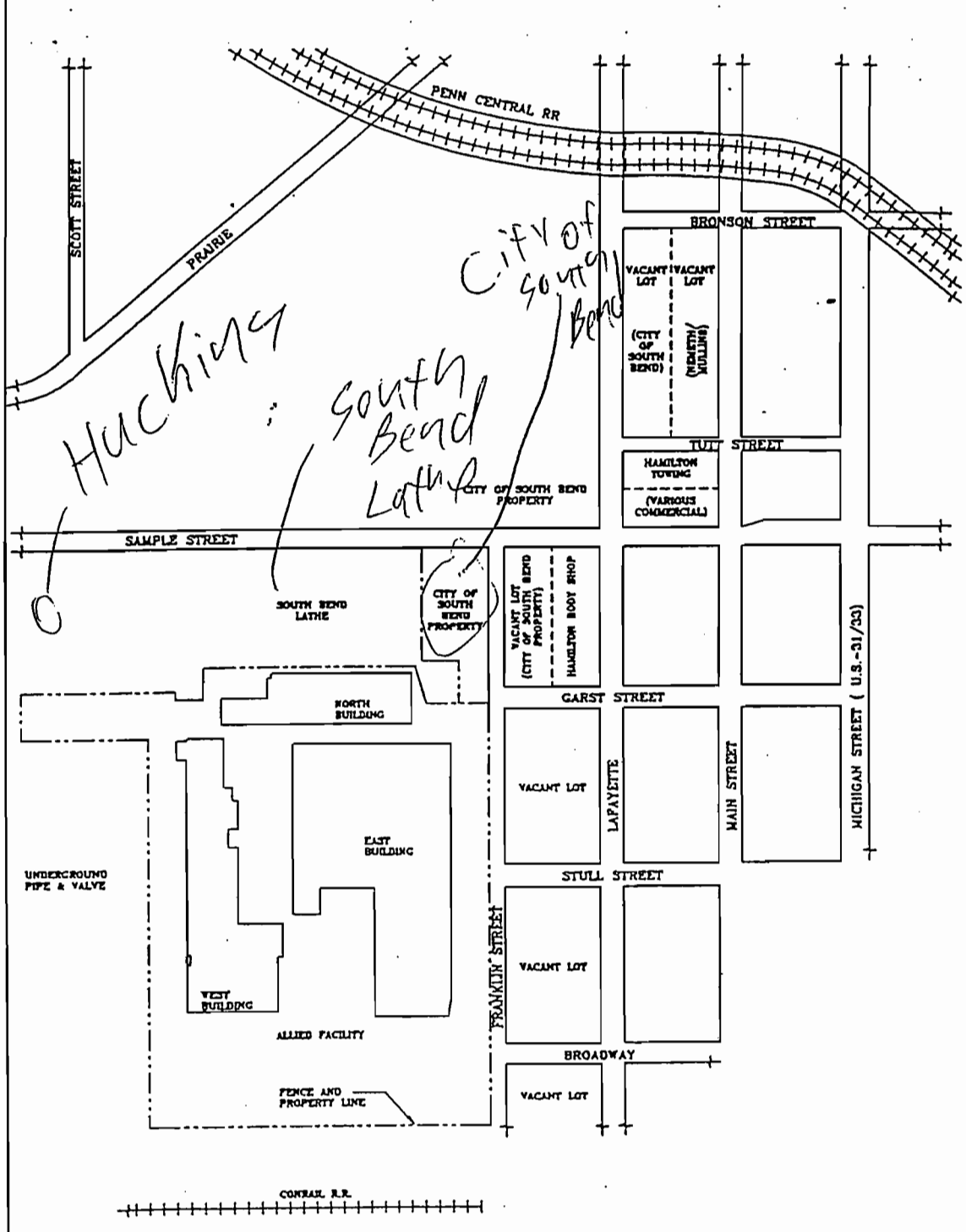


Figure 3

APT

WATER SUPPLY WELLS
ALLIED PRODUCTS

DWG: 8708-A88	DATE: 2-13-94	CHKD BY: JRR 5-31-95	REV DATE:	CHKD BY:



SOURCE. SURVEY MAP BY L. STRACHMAN.
SCALE 1in = 80ft.. DATED 3-13-85

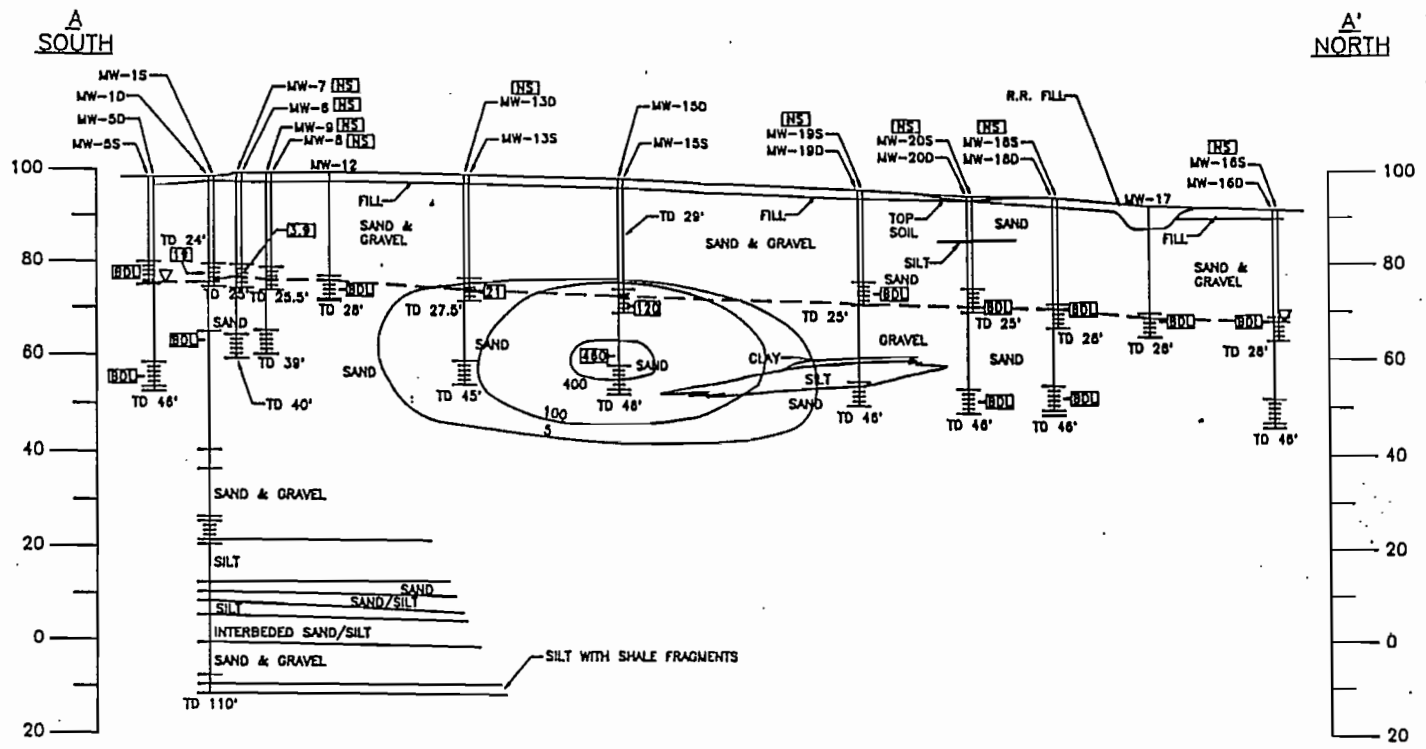
SCALE
0 300 600 FEET

Figure 2

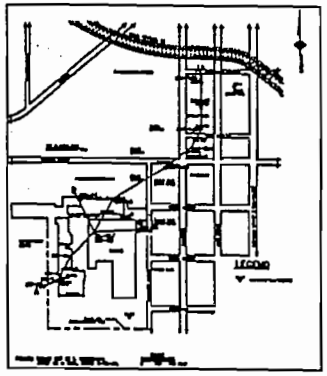
SITE MAP AND ENVIRONS
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8708-A07	DATE: 5-4-95	CHKD BY: JLC 5/31/95	REV DATE:	CHKD BY:



KEY MAP



LEGEND

- SCREENED INTERVAL
- 460 PCE CONCENTRATION IN SOIL (µg/L)
- BDL = BELOW DETECTION LIMIT
- NS = NOT SAMPLED

NOTE: ELEVATIONS WERE MEASURED FROM TEMPORARY BENCH MARK (100.00).

SCALE
0 200 400 FEET

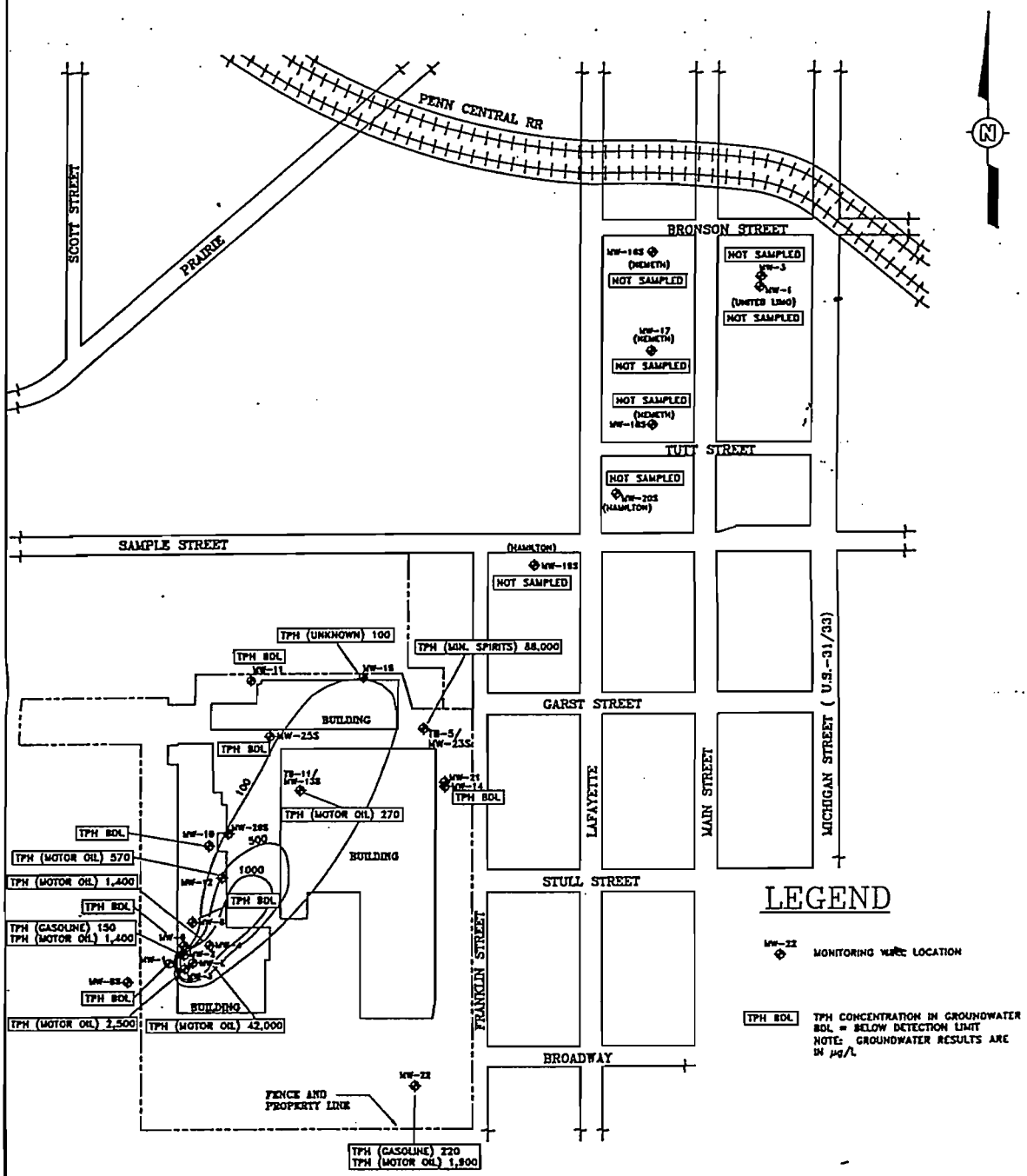
Figure 9

APT

NORTH – SOUTH
CROSS-SECTION A – A'
PCE IMPACTED SOIL
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8703-m15	DATE: 3-16-95	CHKD BY: JEK SHIPS	REV DATE:	CHKD BY:



SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-86.

Figure 11

TPH DISTRIBUTION IN GROUNDWATER – SHALLOW
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

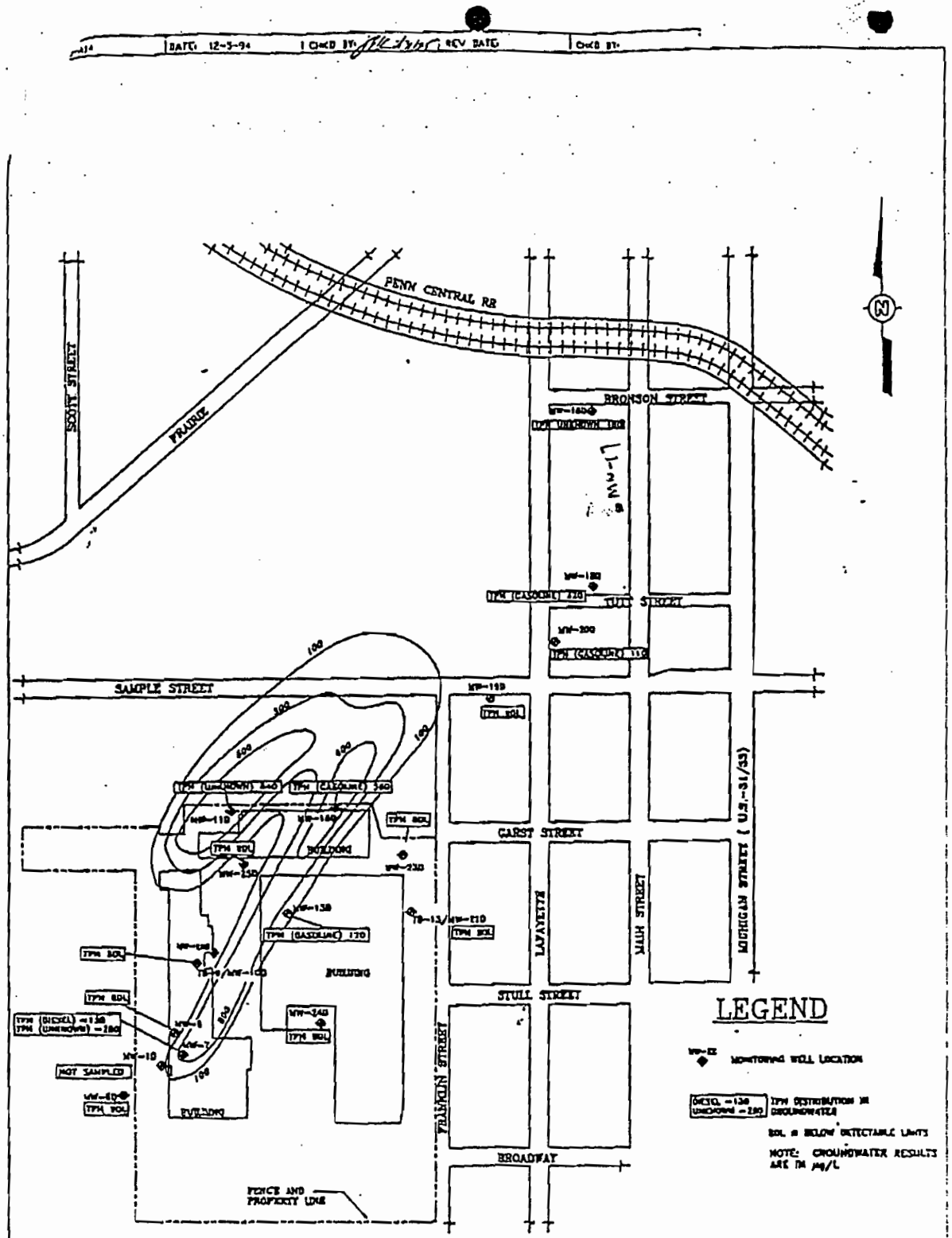


Figure 12

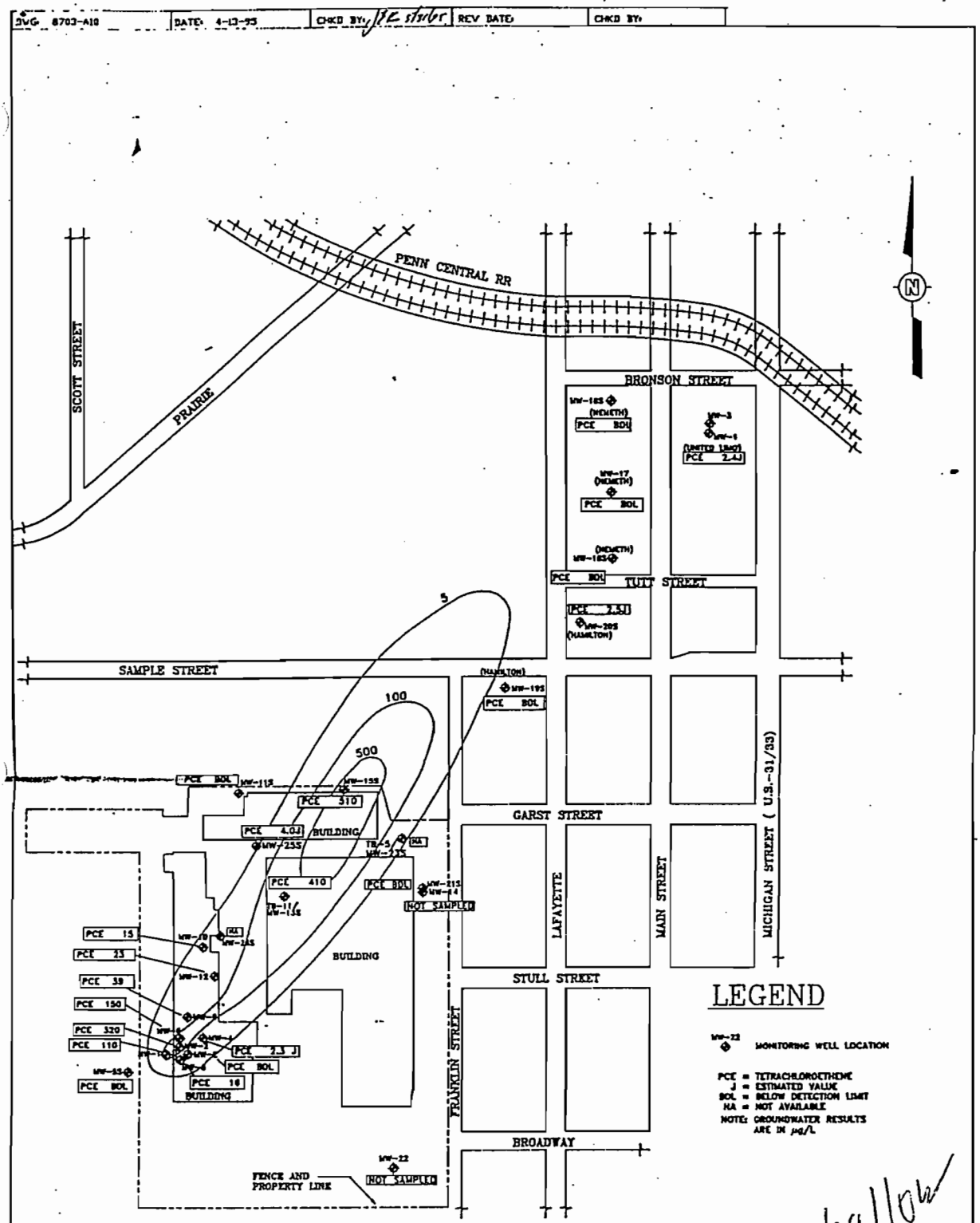
TPH DISTRIBUTION IN GROUNDWATER - DEEP
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

APT

SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

SCALE
0 200 400 FEET



SOURCE: SURVEY MAP BY L. STRACHMAN, SCALE 1in = 80ft., DATED 3-13-85.

Figure 14

PCE DISTRIBUTION IN GROUNDWATER - DEEP
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

APT

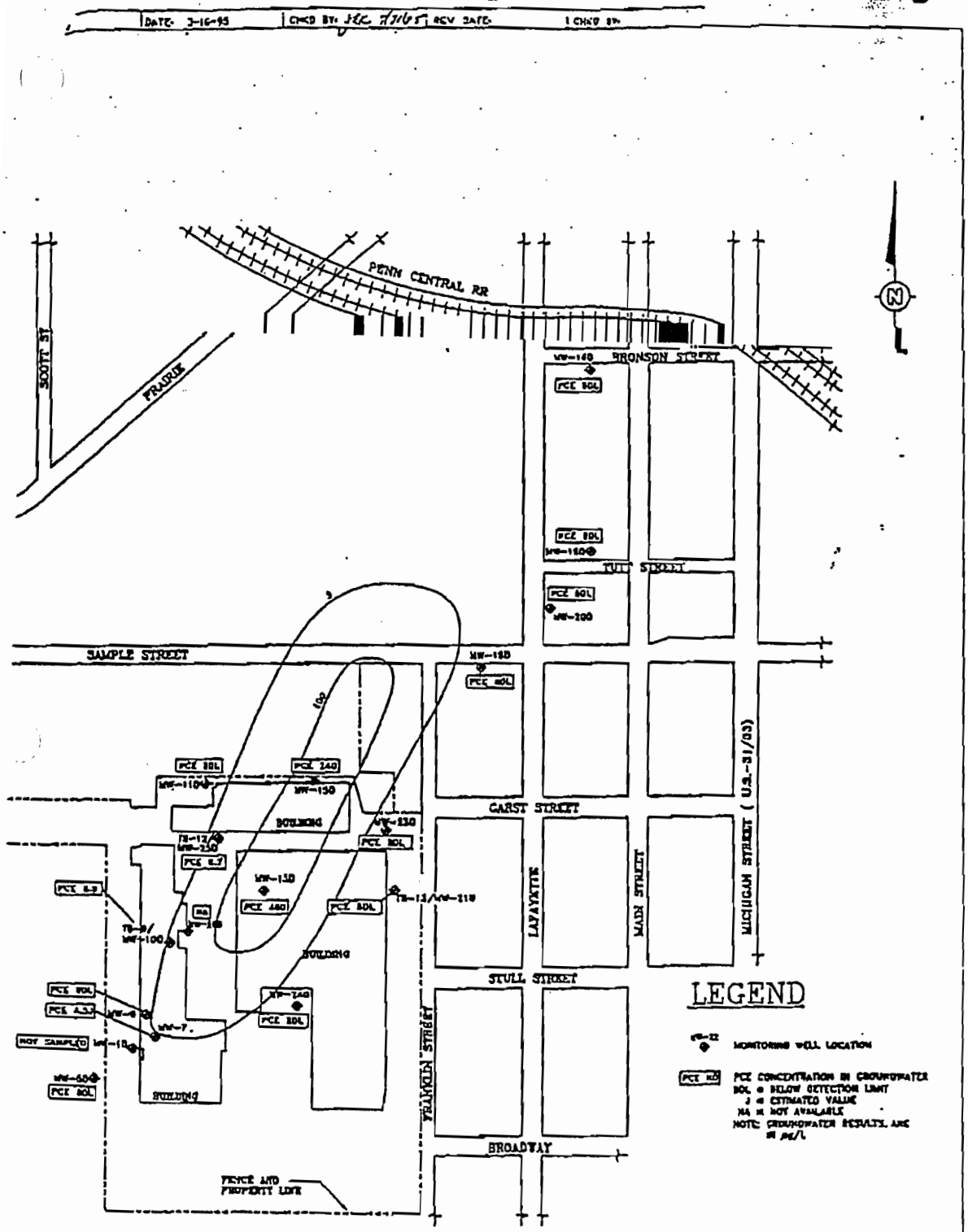


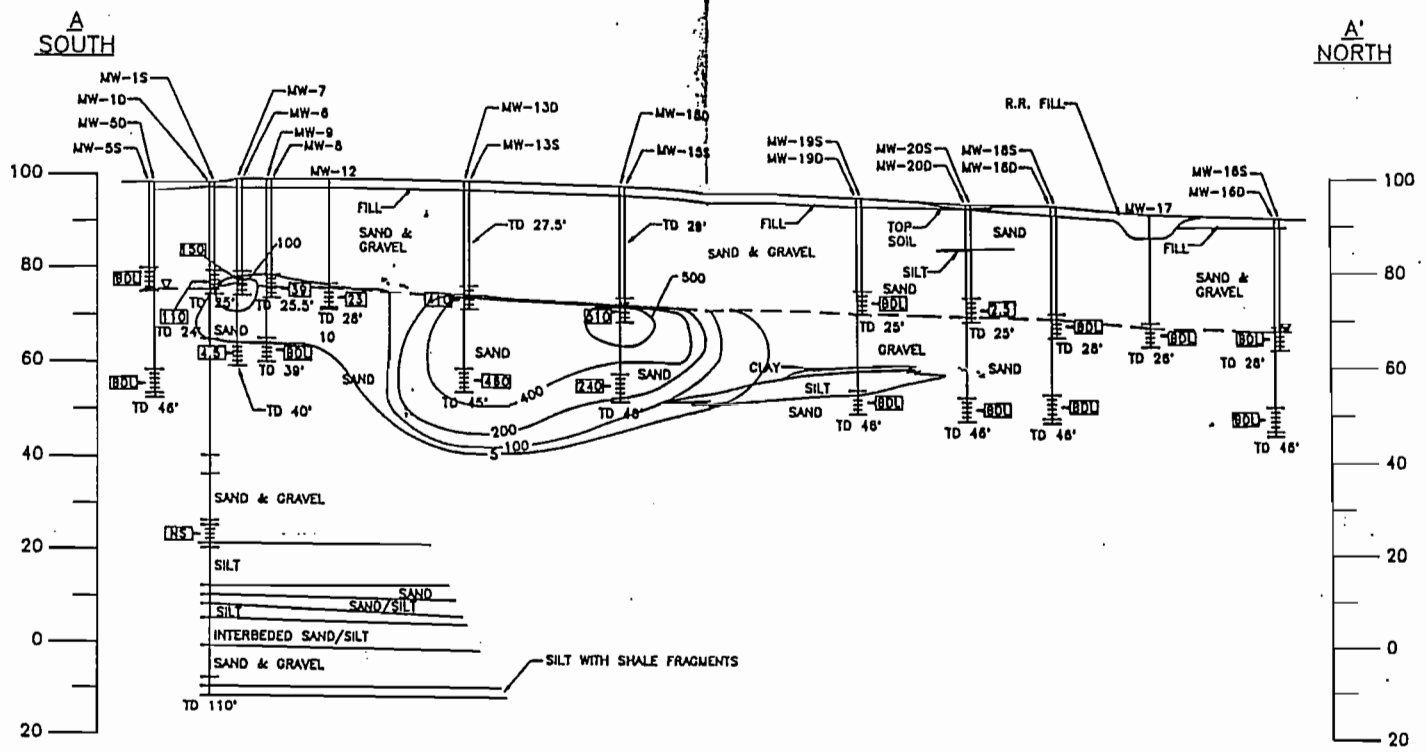
Figure 15

APT

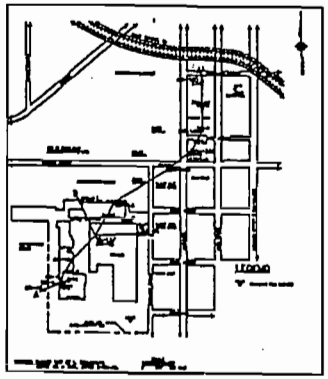
PCE DISTRIBUTION IN GROUNDWATER - DEEP
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS

DWG: 8708-A03	DATE: 5-4-95	CHKD BY: JHL 5/16/95	REV DATE:	CHKD BY:



KEY MAP



LEGEND

- SCREENED INTERVAL
- 480 PCE CONCENTRATION IN GROUNDWATER (µg/L)
  BDL = BELOW DETECTION LIMIT
  NS = NOT SAMPLED

NOTE: ELEVATIONS WERE MEASURED FROM TEMPORARY BENCH MARK (100.00).

SCALE:
0 200 400 FEET

Figure 16

APT

NORTH – SOUTH
CROSS-SECTION A – A'
PCE IMPACTED GROUNDWATER
ALLIED PRODUCTS
SOUTH BEND, INDIANA

PREPARED FOR
ALLIED PRODUCTS
CHICAGO, ILLINOIS