Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS

Report

Phase III Remedial Investigation General Instrument Corporation Hicksville, New York

September 1997

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PHASE III REMEDIAL INVESTIGATION

GENERAL INSTRUMENT CORPORATION

HICKSVILLE, NEW YORK

Prepared for

GENERAL I NSTRUMENT CORPORATION

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GENERAL INSTRUMENT CORPORATION
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SECTION 1 - INTRODUCTION

This report has been prepared to summarize the activities, findings, and conclusions associated with the completion of Phase III of the Remedial Investigation at the General Instrument (GIC) facility. Phase III was requested by the New York State Department of Environmental Conservation (NYSDEC) to investigate potential off-site impacts to groundwater

SECTION 2 - OBJECTIVES

This report was prepared at the conclusion of the Phase III field work upon receipt of the analytical data from the groundwater sampling which occurred. Based upon a review of the acquired data, this report was prepared to meet the following objectives:

1. Summarize the Phase III field work, findings, and conclusions.

2. Review historical and current groundwater data from the GIC facility to evaluate trends over time and draw conclusions regarding natural attenuation.

3. Review groundwater quality data from area sites being investigated to evaluate the overall impacts of the GIC facility with respect to area groundwater quality and impacts by others.

To achieve these objectives, Stearns & Wheler installed three new monitoring wells on the King-Kullen property south of and downgradient from the GIC facility, and collected and analyzed groundwater samples from new and existing monitoring wells (Figure 1-1). Once this data was obtained, its significance was evaluated by comparing it to historical data from the GIC investigation and to groundwater data from investigations at surrounding sites.

SECTION 3 - REVIEW OF PREVIOUS FIELD INVESTIGATIONS AND RESULTS

The initial remedial investigation was completed in January 1993. A number of conclusions regarding the fate and migration of the VOCs at the GIC site were made during this investigation. Following is a brief summary of those conclusions.

1. The site is underlain by 1,100 feet of unconsolidated material. The local aquifer, the Magothy formation, lies from approximately 100 feet below grade to the top of the Raritan clay. The Magothy formation is an important groundwater source for Long Island. Groundwater in the aquifer flows to the south.

2. A leaking 2,000-gallon waste solvent underground storage tank is considered the source for trichloroethene (TCE), tetrachloroethene (PCE), the aromatics ethylbenzene and xylene, and the semi-volatile 1,2-dichlorobenzene impacts to groundwater. A plume containing TCE and PCE was found to extend to the south-southwest from the source. The other VOCs did not migrate far from the source.

3. A leaking 1,000-gallon waste solvent tank was identified along the westernmost portion of the building. Groundwater impacts were detected in Well W-10-71, approximately 110 feet downgradient from the tank. A hydrogeochemical evaluation indicated that a narrow plume extends from the tank to the south.

4. PCE and TCE were detected in groundwater at Well W-3-72, which is located in the vicinity of a former surface impoundment. There was no residual contamination in the soil column beneath the impoundment, suggesting that the impact is from an off-site source to the north.

5. Significant concentrations of total VOCs were detected in Well W-11-70. Hydrogeochemical analysis indicates that the water in this area is not impacted by the 2,000-gallon tank. The source for these impacts was apparently a closed catch basin located in the service tunnel north of Well W-11-70.

6. A risk assessment based on the data collected at the site indicated that there was no measurable effect of site contaminants on either industrial or municipal supply wells.

7. Remedial alternatives were addressed in the feasibility study (FS). Two operable units were designated in the FS. Operable Unit 1 is the soil at the site, and Operable Unit 2 is the groundwater. The FS has been completed for Operable Unit 1 only. The alternative recommended was a soil vapor extraction system which would remove the residual contamination found in the soil beneath the tanks. One SVE system was installed and operated for approximately two years, removing several tons of VOCs. That system was decommissioned because of operational problems, and a new system is due to be started in the summer of 1997.

8. The RI indicated the potential for two off-site sources. The northern source was thought to be the Air Techniques facility. Analysis of the content of drums uncovered during an excavation at the site indicated that they had high concentrations of PCE and TCE. This is the suspected source of impact at Wells W-3-72 and W-3D-112. High concentrations of VOCs at Wells W-12-70 and W-12D-72 were attributed to a source to the east of the site, since the concentrations at these wells were higher than in other downgradient wells. In addition, the plume emanating from the 2,000-gallon tank was thought to be very narrow, not allowing for dispersion as far east as the Well 12 cluster.

A second phase of the RI was conducted in 1994 and included the following tasks:

1. Installation of a single deep monitoring well in the vicinity of the former 2,000-gallon tank to determine the depth of the plume in this area. During installation of the monitoring well, W-14-150, groundwater samples were collected from 110, 120, and 130 feet to determine the appropriate completion interval for the well. The highest concentrations of VOCs were detected in the 110-foot sample. VOC concentrations declined in the 120- and 130-foot samples, indicating that the highest VOC concentrations are at or above the 110-foot depth. The well was screened from 140 to 150 feet above an apparent low permeability layer.

2. Completion of a soil vapor survey along the southern and western boundaries of the site.

3. Soil sampling at the site of the closed hazardous waste storage area.

4. Sampling and analysis for VOCs in soils below the sump in the tunnel.

5. Sampling and analysis of all on-site monitoring wells for VOCs, freon and fluoride.

The following results and conclusions were derived from the Phase II work:

1. The soil vapor survey results indicated that there was no migration of organic vapors to or beyond the western or southern boundaries of the property.

2. The soil samples collected in the hazardous waste storage area indicated only minimal impact by VOCs, and that the area was not a source of significant VOC impact to soil or groundwater warranting further concern.

3. Sampling within the sump indicated a significant accumulation at shallow depths, with the levels of residual VOCs rapidly declining with depth.

4. The groundwater was analyzed for fluoride. The fluoride concentrations ranged from <1 mg/l to 9.4 mg/l.

5. Concentrations of VOCs in the groundwater at the site declined since prior sampling events, possibly the result of the operation of the soil vapor extraction system and natural degradation of the compounds.

After this phase of work, it was recommended that the soils in the sump area be excavated and disposed of. As much soil as possible was removed using hand tools during an IRM effort. Residual impacts remained in the sump following this effort, which was limited due to the access restrictions of the tunnel. An additional recommendation was the installation of an additional downgradient monitoring well on the King Kullen property to determine if the VOCs have migrated a significant distance downgradient.

SECTION 4 - PHASE III REMEDIAL INVESTIGATION

4.1 FIELD INVESTIGATION TASKS

In April 1997, a third phase of the remedial investigation was completed. In this phase, three additional wells were installed on the King-Kullen property south of the GIC facility. One well was proposed for each of the three plumes identified on the GIC property, the plume associated with the 2,000-gallon tank (Well W-16-148), the plume associated with the 1,000-gallon tank (Well W-15-170), and the plume associated with the tunnel sump (Well W-17-130). Completion depth of each well was determined in the field based on field GC results of groundwater samples collected as the borings were advanced. Wells were installed using a combination of hollow-stem augers and the mud rotary technique. The top 60 feet of each boring, above the water table, was advanced using 8-1/4-inch hollow-stem augers. To keep the upper part of the hole open while mud rotary drilling below groundwater, 6-inch black steel casing was advanced from the surface to the water table. This casing was extended above the ground surface at W-16-148 and W-17-130 to serve as a protective cover for the well. W-15-170 was installed in a trailer parking area and therefore was completed at grade. During drilling, groundwater samples were collected every 20 feet in advance of the drill bit using a hydropunch. The samples were analyzed using a field gas chromatograph to determine the concentrations of VOCs at different depths within the water column. Each boring was advanced until a maximum concentration of VOCs was reached, followed by two consecutive decreases in VOC concentrations (Table 1-1). The well screen was then placed in the area of the highest VOC concentration. Each well was constructed of 2-inch ID stainless steel screens and risers. Well W-15-168 was screened from 158 feet to 168 feet, Well W-16-148 was screened from 138 feet to 148 feet, and Well W-17-130 was screened from 120 to 130 feet. The annulus around the well was backfilled with a sand pack, followed by a bentonite seal and grouted to the surface. Well-specific construction details are found in Appendix A.

After well development, each of the new downgradient wells, as well as selected on-site wells, were sampled for volatile organic compounds and fluoride.

4.2 RESULTS

The primary objective of the Phase III effort was to determine if impacted groundwater has migrated from the site. In an earlier phase of the investigation, Monitoring Well W-13 -70 had been installed off site, downgradient from Well W-10-70. The off-site well was installed in that location because W-10-70 had contained the highest concentrations of VOCs of the four downgradient boundary wells. In its one sampling event, W-13-70 showed no significant impacts. Well W-13-70 was subsequently destroyed by construction activities on the King-Kullen property.

Analytical results from the May 1997 sampling event are summarized on Table 1-2. Impacts by VOCs are indicated in each of the three wells. Total VOCs in the three wells are 272 μg/l, 1,360 μg/l, and 530 μg/l in Wells W-15-168, W-16-148, and W-17-130, respectively.

In addition to sampling the 3 new off-site wells, 11 existing on-site wells were also sampled. The results of the analyses of the samples from those wells are also summarized on Table 1-2. Figures 1-2 to 1-7 illustrate the concentrations of TCE, PCE, and total VOCs in both the shallow and deep sections of the aquifer, based on the May 1997 sampling event.

There are still indications of off-site to on-site migration of contaminants from the north, as seen in the concentrations of VOCs in Wells W-3-72 and W-3D-112 -- 142 μg/l and 112 μg/,l respectively.

4.3 ADDITIONAL INVESTIGATIVE EFFORTS

In the course of completing this investigation, Stearns & Wheler and GIC became aware that the former Sylvania property to the north (of which Air Techniques comprised the southern portion) was undergoing an investigation related to radiological wastes and impacts, and that radiological impacts could have potentially migrated onto GIC property. Because of consequences associated with operating remediation systems on the GIC property, investigative efforts related to radiological wastes were conducted. Monitoring Wells W-3-70, W-3D-112, W-1-75, and W-1D-120 were sampled for uranium, thorium, radium, and gross alpha and beta activity. The results suggested that wells near the upgradient boundary of the GIC site are impacted by radiological materials at levels exceeding drinking water standards. Near the central portion of the site, radiological impacts were

indicated, but at levels that could be considered background. Prior testing on the Sylvania property indicated gross alpha activity in that downgradient well (W-3) of 50 pCi/L, as compared to the standard of 5 pCi/L. Analytical results and correspondence related to the additional investigative efforts are attached as Appendix B.

SECTION 5 - SUMMARY OF HISTORICAL DATA

5.1 SUMMARY OF SAMPLING EVENTS

Groundwater quality data has been collected at the GIC site during an 11-year period. In 1986, six wells were sampled by BCM as part of an early investigation completed for GIC. The wells were sampled in 1986 and again in July 1987. Since then, 14 additional monitoring wells have been installed both on and off the site, for a total of 20 wells. These wells, or combinations of them, were sampled in 1990, 1991, 1994, and 1997. The available data allows an assessment of the natural attenuation that is occurring at the site. Following are brief descriptions of prior sampling events at the site. Accompanying each description are tables that summarize the analytical data and maps that depict TCE, PCE, and total VOC concentrations in groundwater for each sampling event.

Other contaminants of concern at the site include ethylbenzene and xylene. However, these compounds do not appear to have migrated from the source. During each sampling round, the only locations at which these compounds have been identified are at well cluster W-1-75 and Wells W-2-70 and W-14-150, all of which are immediately downgradient from or in the area of the 2,000-gallon waste solvent tank. These aromatic compounds have not been detected in the wells farther downgradient.

The reason for the reduction in the concentrations of ethylbenzene and xylene to below detection limits in the downgradient wells is probably attributable to natural attenuation within the system. Groundwater in the Magothy aquifer is oxic. Aromatic compounds such as ethylbenzene and xylene are readily biodegradable in oxic conditions. Chlorinated compounds such as TCE and PCE degrade more quickly in anoxic conditions. A review of the Eh (a measure of the oxidation-reduction potential) data from the site indicates that groundwater in the vicinity of the source is anoxic. The reduction in oxygen is the result of the aerobic biologic activity in the area. The microbes in this area are using the ethylbenzene and xylene as a carbon source, greatly reducing concentrations of those

compounds within a short distance of the source area. The TCE and PCE migrate out of the source area, which is now less oxic, into the more oxygen-rich waters of the aquifer. Because of the prevalence of aerobic microbes in these areas, there is not a significant degradation of the chlorinated compounds. They will therefore be seen migrating further downgradient than the aromatic compounds.

A. **June 1986 Groundwater Results**. In July 1986, six wells were sampled for volatile organic compounds. During the sampling event, the highest concentrations of VOCs were detected at Well W-1-75 (Table 1-3). This well is located immediately downgradient of a former waste solvent tank. Total VOC concentrations of 42,847 μg/l were detected at this point. All other VOC concentrations for individual compounds and total VOC concentrations were substantially lower than at W-1-75.

Maps depicting the concentrations of TCE and PCE indicate that there are three possible sources of VOC contamination: two on-site and one upgradient off-site source (Figures 1-8, 1-9, and 1-10). The on-site sources are located west of the boiler room (Area of Concern A) and west of the westernmost portion of the building (Area of Concern B). The third area is the potential off-site source located north of the GI site.

B. **July 1987 Groundwater Results**. In a second round of groundwater sampling, BCM collected and analyzed samples from five of the six wells. Well W-1-75 was not sampled due to dedicated pump failure. Total VOC concentrations at Well W-3-72 fluctuated from 558 μg/l to 2512 μg/l and total VOC concentrations at well W-6-79 dropped from 1554 μg/l to 30 μg/l (Table 1-4). The total VOC concentrations at the other wells remained essentially the same. It should be noted that PCE was not detected in any of the wells.

Maps illustrating the concentration of TCE and total VOCs indicate that there were two on-site sources of VOCs and one off-site source (Figures 1-11 and 1-12), as seen in the 1986 data.

C. **November 1990 Groundwater Results**. In the fall of 1990, Stearns & Wheler began a remedial investigation at the General Instrument site. In November 1990, groundwater samples from 16 wells were collected and analyzed for volatile organic compounds (Table 1-5). The results of this analysis essentially mirror earlier work. The wells in the vicinity of the waste solvent tanks have higher concentrations of contaminants than those farther downgradient, and it appears that the

aromatics ethylbenzene and xylene are degraded rapidly as they migrate away from the source since they are not found in the downgradient wells. The only exception to this is Well W-10-71, which is approximately 100 feet south of the 1,000-gallon tank located on the western portion of the property.

D. **April 1991 Groundwater Results**. In support of the remedial investigation Stearns & Wheler began in 1990, remedial groundwater samples were collected again from 16 wells in April 1991. These results were interpreted in the Remedial Investigation Report (January 1992). Based on a geochemical evaluation of the groundwater collected, it was determined that other than the former 2,000-gallon waste-solvent tank (Area of Concern A), two additional on-site sources for VOCs exist: a 1,000-gallon waste solvent tank formerly located on the western portion of the building (Area of Concern B), and a closed catch basin in the north-south running tunnel between the boiler room and the front of the facility (Area of Concern C). Analytical results are summarized on Table 1-6.

Figures 1-13 to 1-18 support the conclusion that three on-site sources exist at the site. This conclusion is further supported by additional data collected at the site since this time.

E. **December 1994 Groundwater Results**. In December 1994, groundwater samples were collected from 17 wells on the site. Well W-14-150 was installed as part of this field effort to determine the thickness of the plume in the vicinity of the waste solvent tank in Area of Concern A. The analytical results from this sampling event are summarized on Table 1-7. Although concentrations of VOCs are somewhat less than in prior sampling events, the same general conclusions previously reached are supported by this data. Figures 1-19 to 1-24 illustrate these analytical results.

5.2 TRENDS IN GROUNDWATER CONCENTRATIONS - 1986 TO 1997

Six separate groundwater sampling efforts have been completed at the GIC site since 1986. In an effort to illustrate the trends in groundwater concentrations during that time, we have plotted the concentration of TCE and PCE from both shallow and deep wells against the date on which they were collected. This gives us an indication of how the concentrations of the contaminants are changing over time at given well locations.

A. **Trichloroethene Trends**. Trends in the concentration of TCE in shallow and deep wells at the site over time are illustrated on Figures 1-25 and 1-26. Since the April 1991 sampling event, TCE concentrations in both the deep and shallow portions of the aquifer have steadily declined over time. Prior to 1991, there were some indications of increases in concentrations over time which may be indicative of the movement of a "slug" of impacted water at the time. The plots suggest significant decreases in the concentrations of TCE in the last six years. In the 2,000-gallon tank plume, TCE levels in W-1-75 have decreased from 48,000 to 1,900 μg/l. Well W-2-70 declined from 1,400 to 62 μg/l. Downgradient Well W-5-78 has declined from 180 μg/l to 23 μg/l. In the deeper portion of aquifer, TCE levels in W-1D-120 declined from 210 μg/l to 1 μg/l. In Well W-2D-120, TCE levels declined from 12,000 to 34 μg/l. In the 1,000-gallon tank plume, similar trends are seen. Although some fluctuations are evident, the concentration of TCE in W-10-71 has declined from 700 μg/l to 200 μg/l. In the deep portion of the aquifer, W-10D-120 has declined from 34 μg/l to 9 μg/l. Similar declines are seen in the tunnel sump plume, where Well W-11-70 currently had a result of 14 μg/l.

The declines indicated by the data are considered to be valid because the decline is seen in trends, not just as a possibly anomalous set of data.

B. **Tetrachloroethene Trends**. Tetrachloroethene (PCE) shows similar trends to those of TCE, as shown in Figures 1-27 and 1-28. Steady declines are evident in both the shallow wells and deep wells from 1991 to 1997. In the 2,000-gallon tank plume, PCE levels in W-1-75 have decreased from 4,000 to 320 μg/l. Well W-2-70 declined from 250 to 18 μg/l. Downgradient Well W-5-78 has declined from 22 μg/l to 4 μg/l. In the deeper portion of aquifer, PCE levels in W-2D-120 declined from 1,000 μg/l to 2 μg/l. In the 1,000-gallon tank plume, similar trends are seen. Although some fluctuations are evident, the concentration of PCE in W-10-71 has declined from 470 μg/l to 68 μg/l. In the deep portion of the aquifer, W-10D-120 has declined from 34 μg/l to 4 μg/l. Similar declines are seen in the tunnel sump plume, where Well W-11-70 currently had a result of 3 μg/l.

C. **Conclusions Regarding Trends Over Time**. The evaluation of historic data and accompanying Phase III data was completed using tables, graphs and illustrations. From this information it has been determined that although there was an initial increase in total VOCs from the first sampling conducted in 1986, since 1991, the concentrations of total VOCs have been

reduced considerably. This is noted most readily in the wells closest to the sources of the VOCs. The downgradient wells show a generally downward trend in concentrations in VOCs during the course of this investigation, although the response is not as significant as those in the wells in the vicinity of the sources.

There are three reasonable explanations for the significant decline in concentrations of the VOCs in the groundwater: (1) he removal of the sources (the leaking tanks) in the early 1980s; (2) the removal via the SVE system of high concentrations from soils beneath the tanks that had acted as a continuing source to groundwater; and (3) natural attenuation, which includes dispersion, natural dilution, and biodegradation.

Although noteworthy concentrations of VOCs were detected in the new wells, it is reasonable to assume that some of the same processes that have resulted in steadily declining concentrations of VOCs on site have been active off site as well. It is therefore plausible that natural attenuation, coupled with the remedial measures implemented to date, may be as effective as more active types of remediation that could be implemented.

SECTION 6 - REGIONAL GROUNDWATER QUALITY

In order to determine the specific impacts of the GIC facility on area groundwater, it was determined appropriate to evaluate the quality of groundwater surrounding the site, especially in the downgradient direction. To do this, groundwater quality data from the several industrial sites in the area undergoing investigations were reviewed. Additionally, groundwater quality data obtained at public supply wells in the area were also reviewed.

Analytical data were gathered and the results graphically represented on Figure 2-1. Figure 2-1 shows the industrial sites reviewed; the contaminants of concern; concentrations of contaminants of concern, if known; and approximate limits of impact, if known. A discussion of the other sites in the area and the extent of impact they have on the regional environment and local water supplies follows.

6.1 INDUSTRIAL SITES

A. **Air Techniques**. Air Techniques is located immediately north of the General Instrument site on a parcel formerly operated by Sylvania. During the field investigation and subsequent analytical analysis, three primary volatile organic compounds were identified on the Air Techniques site: TCE, PCE, and cis-1,2-dichloroethene (Table 2-1). As stated earlier, each of these has also been identified on the GIC facility. Groundwater flow direction in this area is generally from north to south-southwest. Any impacted groundwater on this site has the potential to flow directly beneath GIC property, contributing to local impacts.

Figure 2-1 illustrates the direction of groundwater flow, and in turn, the direction of dissolved contaminant flow from the Air Techniques site. The downgradient limit of the impacts migrating from the Air Techniques sites is unknown. The Air Techniques downgradient well (MW-3) has had a range of total VOCs from 368 to 770 μg/l during sampling completed between November 1995 and September 1996. In addition, GIC upgradient well cluster W-3-72 and W-3D-112, adjacent to the Air Techniques property, consistently has elevated concentrations of VOCs. Reports completed by Air Techniques' consultants state that there is no longer a source of VOCs on the site, and that an upgradient source is responsible for the impacts (ERM, February 1997). The reasoning is that after known source removal, concentrations of VOCs in their upgradient wells are greater than those in the downgradient wells, suggesting that there is no source contributing to the concentration in groundwater as it migrates from upgradient to downgradient.

B. **Mattiace Petrochemical**. On February 17, 1982, 4,800 gallons of methyl ethyl ketone (MEK) spilled from a tanker truck located on Mattiace property. During the next year, the U.S. Environmental Protection Agency, NYSDEC, and NYSDOH failed to produce a cleanup commitment from Mattiace. In June 1983, the USEPA exercised a planned removal action. The removal alternative chosen was a high temperature air stripper (HTAS). During the six-month operation (April to October 1984), 5,767,599 gallons of MEK-impacted groundwater were treated and reinjected into the subsurface. The HTAS was shut down in October 1984.

C. **Anchor Lith/Kem-KO**. There are three contaminants of concern at the Anchor Lith property: bis (2-ethylhexyl) phthalate, chromium, and lead. The site was placed on the National Priority List (NPL) in 1983, after 5 of 17 underground storage tanks (USTs) containing organic solvents failed

tightness tests. A Woodward-Clyde investigation and report on the site recommended no further investigation with respect to groundwater at the site (Woodward-Clyde, 1983).

Groundwater flow from this site is to the south-southwest.

D. **AGO Associates**. From 1963 to 1973, construction/demolition, industrial, commercial, and agricultural wastes were disposed of in a landfill located on this site. Landfilling operations were completed in 1979, when the area was backfilled and leveled. In 1986, a groundwater investigation at the AGO facility indicated that there were elevated levels of VOCs at the site. A Phase I investigation began in November 1989 by YEC, Inc., under contract with Lawler, Matusky & Skelly Engineers LLP. A second phase of work was completed in June 1992 by Roux Associates. During these investigations, both 1,1-dichloroethane and 1,2-dichloroethene were detected in very low concentrations at Well MW-6.

Groundwater flow from this site is to the south-southwest.

E. **Alsy Manufacturing**. Alsy Manufacturing was in operation from 1975 to 1991. During that time, the company used paint strippers, thinners, and degreasers as part of their manufacturing process. SPDES permit violations caused the company to initiate investigations at the site. EA Science and Technology was retained by the NYSDEC to complete a Phase I site assessment. Following the investigation, the site was listed as a Class 2a site in the Registry of Hazardous Waste Sites. An Order on Consent was signed by the state and Surrey Corporation in 1989 requiring the completion of a Phase II investigation. A second order was signed in March 1995 requiring the completion of an RI/FS. A draft remedial investigation was completed by Lawler, Matusky & Skelly Engineers LLP in May 1997.

The RI resulted in the following conclusions (LMS, May 1997):

1. A number of VOCs were detected at the site, including TCE, PCE, cis-1,2-DCE, and 1,1,1-TCA (Table 2-2).

2. The concentrations of the VOCs detected were generally below the NYSDEC Class GA standard, with some samples containing concentrations just over the standard.

3. The groundwater flow direction from this site is to the southwest.

F. **Magnusonic Devices**. In early sampling rounds, three VOCs were detected in groundwater at Magnusonic Devices: toluene, 1,1,1-TCA and 1,1-DCE (Table 2-3, Roux Associates, Inc., January 1996). Of the three, only toluene was detected in shallow groundwater during the remedial investigation. In addition, toluene was detected in deep groundwater only during the initial round of sampling.

Roux Associates believes that an off-site source is responsible for the impacts on the site for the following reasons:

1. The three VOCs were detected in both the upgradient and downgradient monitoring wells.

2. Between the initial and confirmatory sampling rounds, 1,1,1-TCA was detected in every shallow monitoring well sampled at the site (upgradient, downgradient, and crossgradient) indicating regional degradation of ground-water quality from off-site sources.

3. Toluene and 1,1,1-TCA were detected in Monitoring Wells MW-3, MW-4, and MW-5 and 1,1,-DCE was detected in MW-5, which are all located on the east side of the site, adjacent to the former Alsy Manufacturing site.

G. **Depew Manufacturing**. A Phase II investigation was completed at the Depew Manufacturing site in February 1993 by LMS Engineers. During this investigation, two VOCs (1,1,1-TCA and 1,1,2,2-PCA) were detected in upgradient Monitoring Well DMMW-1 (5 μg/l each, Table 2-4). No VOC impacts were detected in the downgradient monitoring wells. With this evidence, LMS concluded that the impacts to site groundwater were not the result of activities on the site, but from upgradient off-site sources.

H. **New Cassel Industrial Area**. The 170-acre New Cassel Industrial Area (NCIA) is located in the Town of North Hempstead, southwest of the GIC facility. Approximately 200 industrial or commercial businesses occupy the site. Due to extensive halogenated volatile organic compound contamination in groundwater beneath the site, the state classified the entire industrial area as a

hazardous waste site in 1988 (LMS Engineers, March 1997). In this report, LMS investigated six sites within the NCIA. Based on their investigation, several contaminant plumes were identified (Figure 2-1). These plumes contained PCE, TCE, vinyl chloride, and other VOCs (Tables 2-5 through 2-8).

Based on this information, LMS recommended that several sites remain listed and others be removed from the list because they were not sources of impact. It was suggested that the sites that were recommended to remain on the list be investigated because the potential source of the groundwater impact may have been upgradient of the sites.

6.2 PUBLIC WATER SUPPLY QUALITY

Several public water supply wells are in the vicinity of these sites. The Hicksville Water District has four wellfields in the vicinity of the GIC facility: one upgradient of the facility; one nearly due south; and two to the southeast (Figure 2-1). Hicksville Wells P-3953 (to the north) and P-5336 (the well farthest southeast) are not currently in service. Each of the Hicksville Water District wells have been impacted by VOCs (Table 3-1). Those that are in service (P-8526 and P-7561) are treated with granulated activated carbon to remove the VOCs, so that the water supply meets state MCLs for drinking water.

The Westbury Water District has a single well (P-6819) west of the GIC facility and north of the NCIA. This well is not used, and therefore no analytical data is available.

The Bowling Green Water District has two wells located south of the NCIA. Each of the wells is impacted by VOCs and requires treatment with granulated activated carbon to reduce the VOCs below MCLs (Table 3-2).

SECTION 7 - CONCLUSIONS AND RECOMMENDATIONS

The objectives of this report are to summarize the Phase III field work findings and conclusions; to evaluate the General Instrument data with respect to trends over time; and to determine the impacts the General Instrument site has on the local area.

7.1 EVALUATION OF HISTORIC DATA OVER TIME AND THE PHASE III GROUNDWATER DATA

Three new deep off-site downgradient wells were installed and sampled. Most existing on-site wells were also sampled. Analytical results from the new wells indicate that groundwater under the King-Kullen property has been impacted by VOCs. Potential sources include the GIC property; upgradient sources, as indicated by the upgradient wells on the GIC property; and a potential source to the east, as suggested by the analytical results from the Well 12 couplet.

A review of the historical data indicates a significant decline in the concentrations of VOCs in groundwater. This decline in concentration is attributed to source removal, soil vapor extraction activities, and natural attenuation.

7.2 REGIONAL GROUNDWATER QUALITY

Regional groundwater quality has been impacted by a number of sites in the vicinity of the GIC facility, including Air Techniques, Mattiace Petrochemical, Anchor/Lith, AGO Associates, Alsy Manufacturing, Magnusonic Devices, Depew Manufacturing, and the New Cassel Industrial Area. Each of these sites has undergone subsurface investigations related to site activities. A number of the reports have concluded that an upgradient source has contributed to the impacts to groundwater on their respective properties. Given this, the lack of an adequate hydrogeochemical evaluation of the regional groundwater in the area, and the fact that a number of the sites have concentrations of the same compounds, it is difficult to determine the impact individual sites have on the regional groundwater quality, other than they have contributed to the overall degradation of regional groundwater.

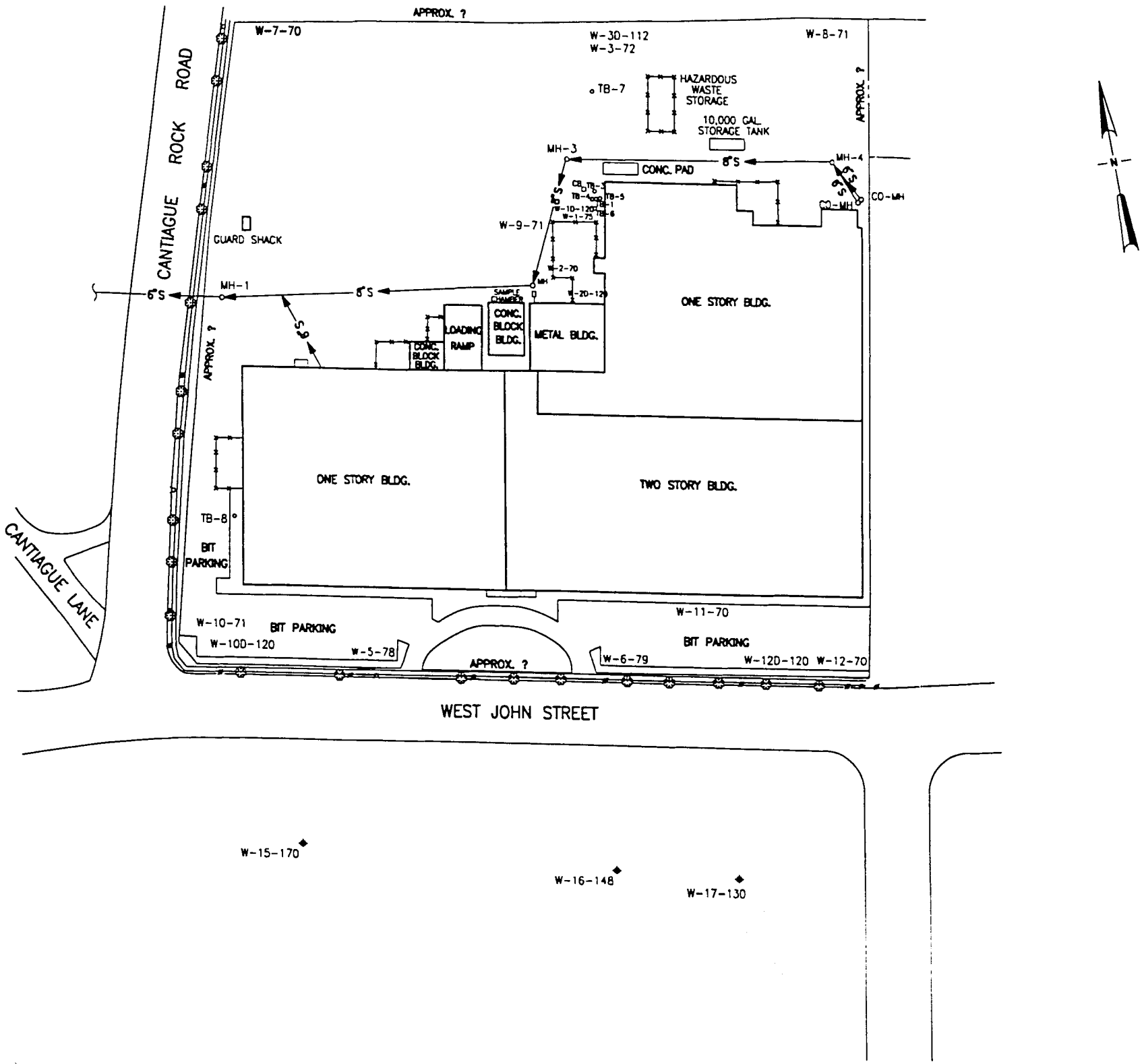
Public water supplies are located upgradient and downgradient from each of the sites. All of the water supplies downgradient of these sites are either closed or currently treated to reduce VOCs to acceptable drinking water levels. At least one well upgradient from the sites has also been closed due to excessive levels of VOCs. As stated earlier, a number of the wells are not in service at this time. Westbury Well P-6819, approximately one-half mile west-southwest of GIC (cross-gradient) has been shut down. The Bowling Green District Wells P-9956 and P-8957, just south of the New Cassel area, are currently treated for VOCs. Hicksville Wells P-7561 and P-8526 are located more than one mile south and southeast of the site and are impacted by VOCs, but treated at the wellhead

to meet drinking water standards. Hicksville Well P-5336, an additional 1,200 feet to the south, was taken out of service due to VOC impacts. Without a complete hydrogeochemical evaluation of each site, it is virtually impossible to determine the bulk impact of each individual site on the regional groundwater quality.

7.3 RECOMMENDATIONS

Based on the data gathered to date, the impacts to groundwater at the GIC site have been sufficiently characterized to allow the completion of a feasibility study for Operable Unit 2, groundwater. Although the downgradient limits of potential impact have not yet clearly been defined, sufficient data exists to support decisions regarding remediation and that any additional downgradient data will not impact the FS decision-making process. Regional data indicates that the underlying aquifer is generally of poor quality. This is supported by site-specific data from many of the facilities in the area where investigations have occurred, as well as from data from public supply wells where impacts cannot easily be attributed to any particular site. In fact, public wells are either being treated or have been shut down due to VOC content where there is no apparent upgradient source. Because of the regionally poor groundwater quality, attempting to find the downgradient limit of the GIC/mixed source plume may not be possible. It is recommenced that the feasibility study be completed at this time using existing data regarding on-site concentrations, off-site downgradient concentrations, natural attenuation, impacts of source removal and soil vapor extraction, and concentrations of radiological wastes in upgradient water.

FIGURES



1"=120'-0" 120 0 120 240

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FIGURE 1-1
BASE MAP

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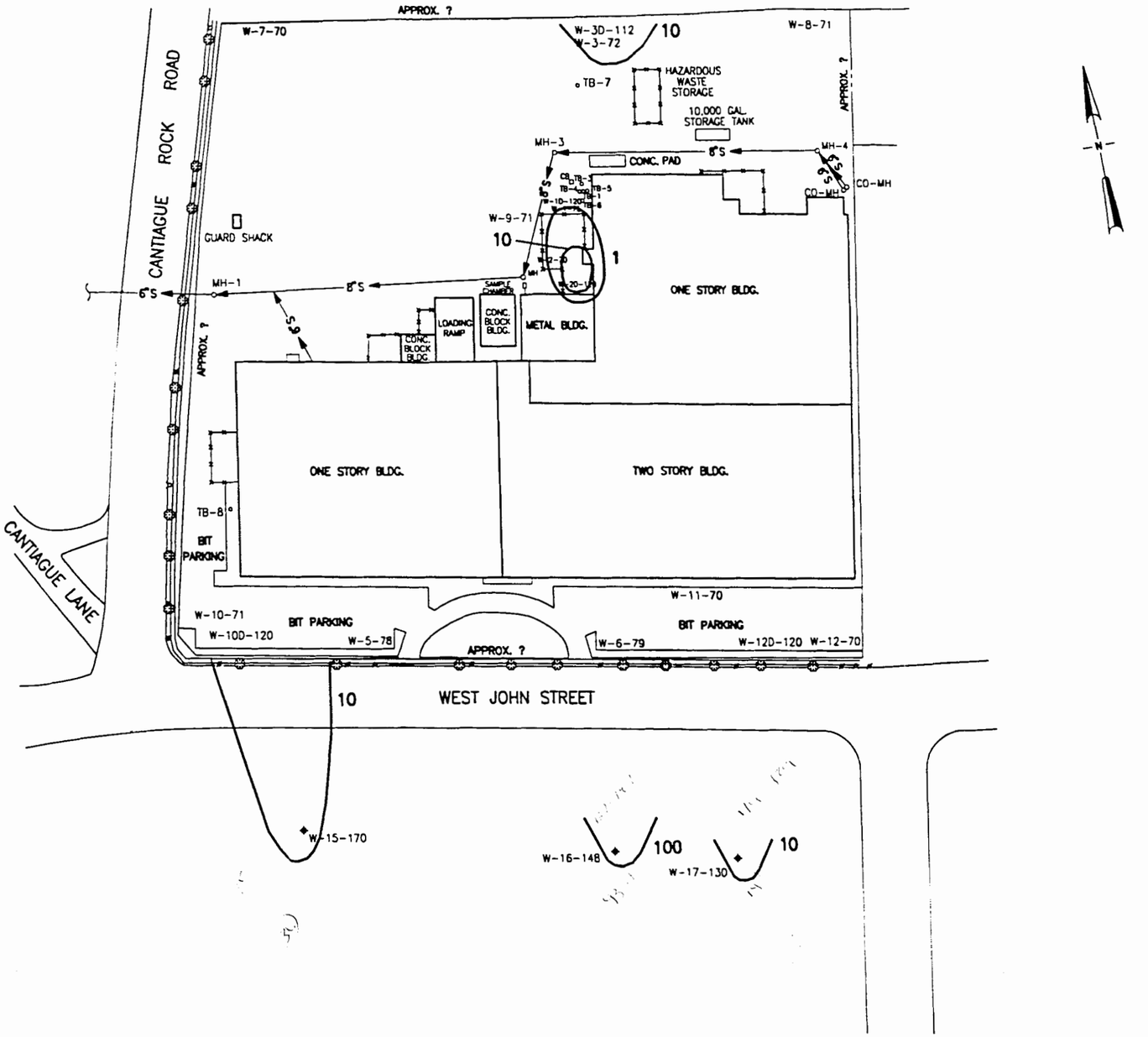

WELL	CONCENTRATION (ug/l)
W-1D-120	1
W-2D-120	34
W-3D-112	20
W-10D-120	4
MW-15	36
MW-16	430
MW-17	14

CI = ORDER OF MAGNITUDE
TCE (ppb)

1" = 120'-0"

120 0 120 240

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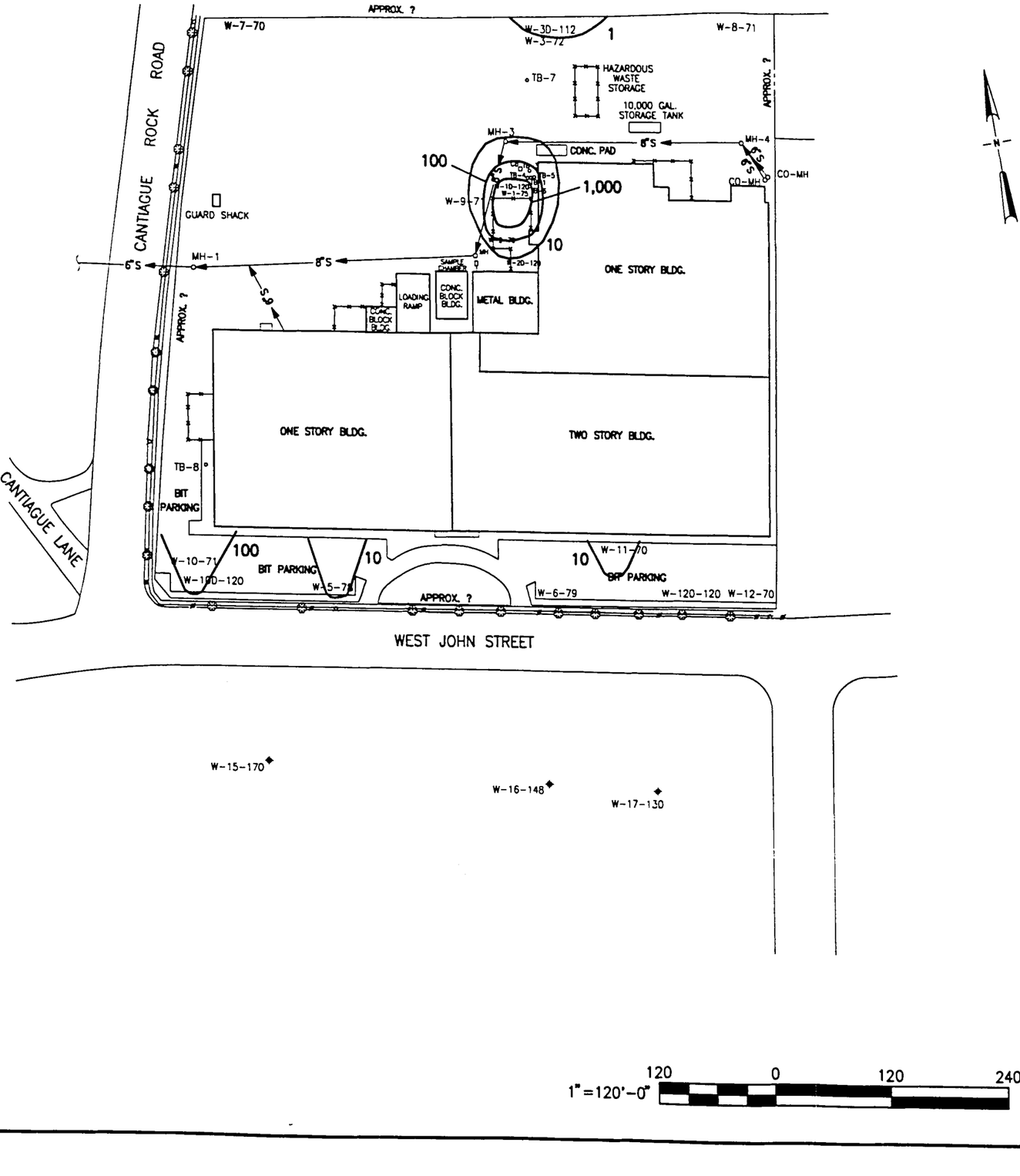
FIGURE 1-2
TRICHLOROETHYLENE ISOPLETHS
DEEP WELLS - 5/97



WELL	CONCENTRATION (ug/l)
W-1-75	1,900
W-2-70	62
W-3-72	6
W-5-78	23
W-10-71	200
W-11-70	14

CI = ORDER OF MAGNITUDE
TCE (ppb)

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FIGURE 1-3
TRICHLOROETHYLENE ISOPLETHS
SHALLOW WELLS - 5/97

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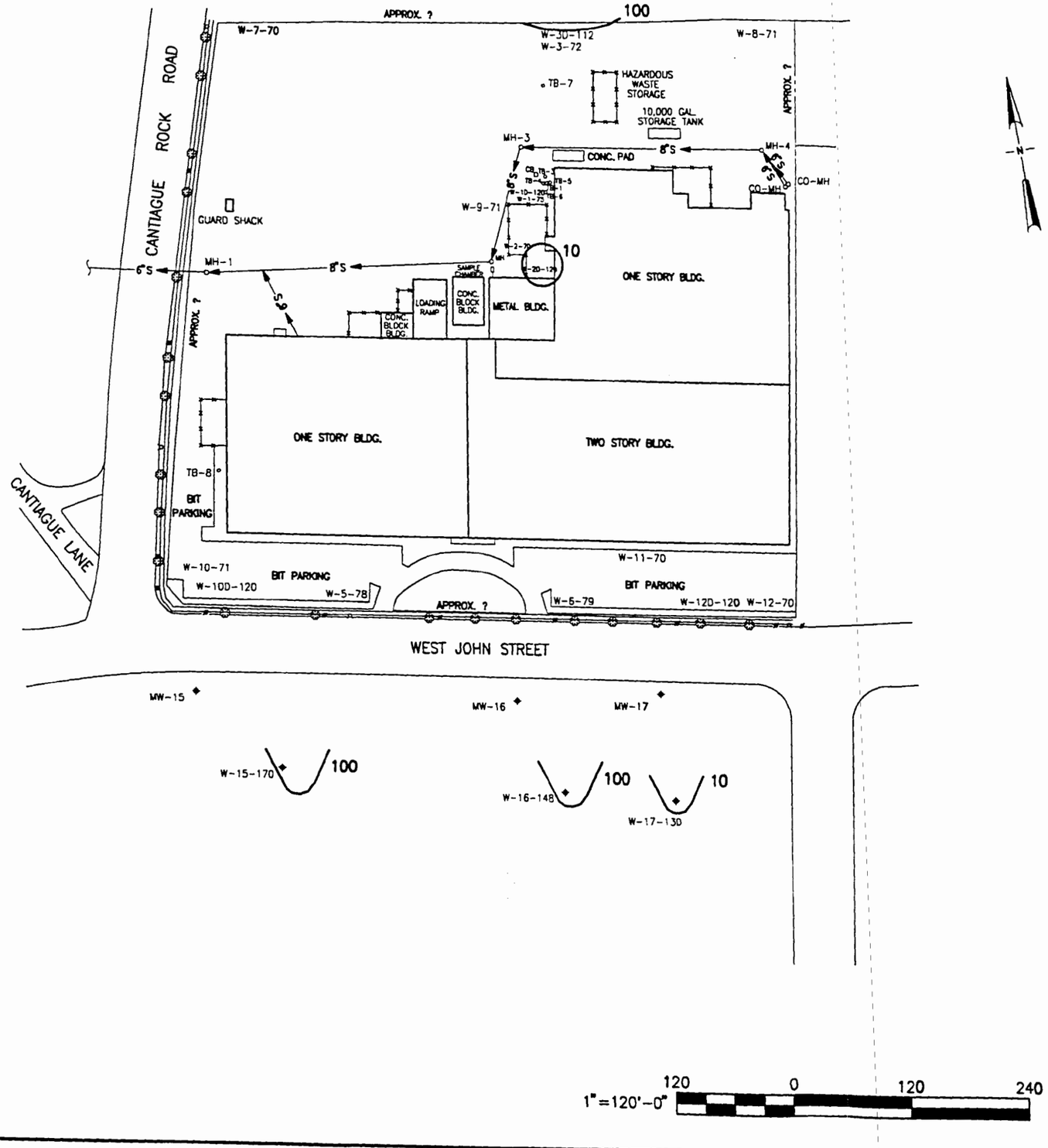

WELL	CONCENTRATION (ug/l)
W-2D-120	2
W-3D-112	92
W-10D-120	4
MW-15	230
MW-16	330
MW-17	530

CI = ORDER OF MAGNITUDE
TCE (ppb)

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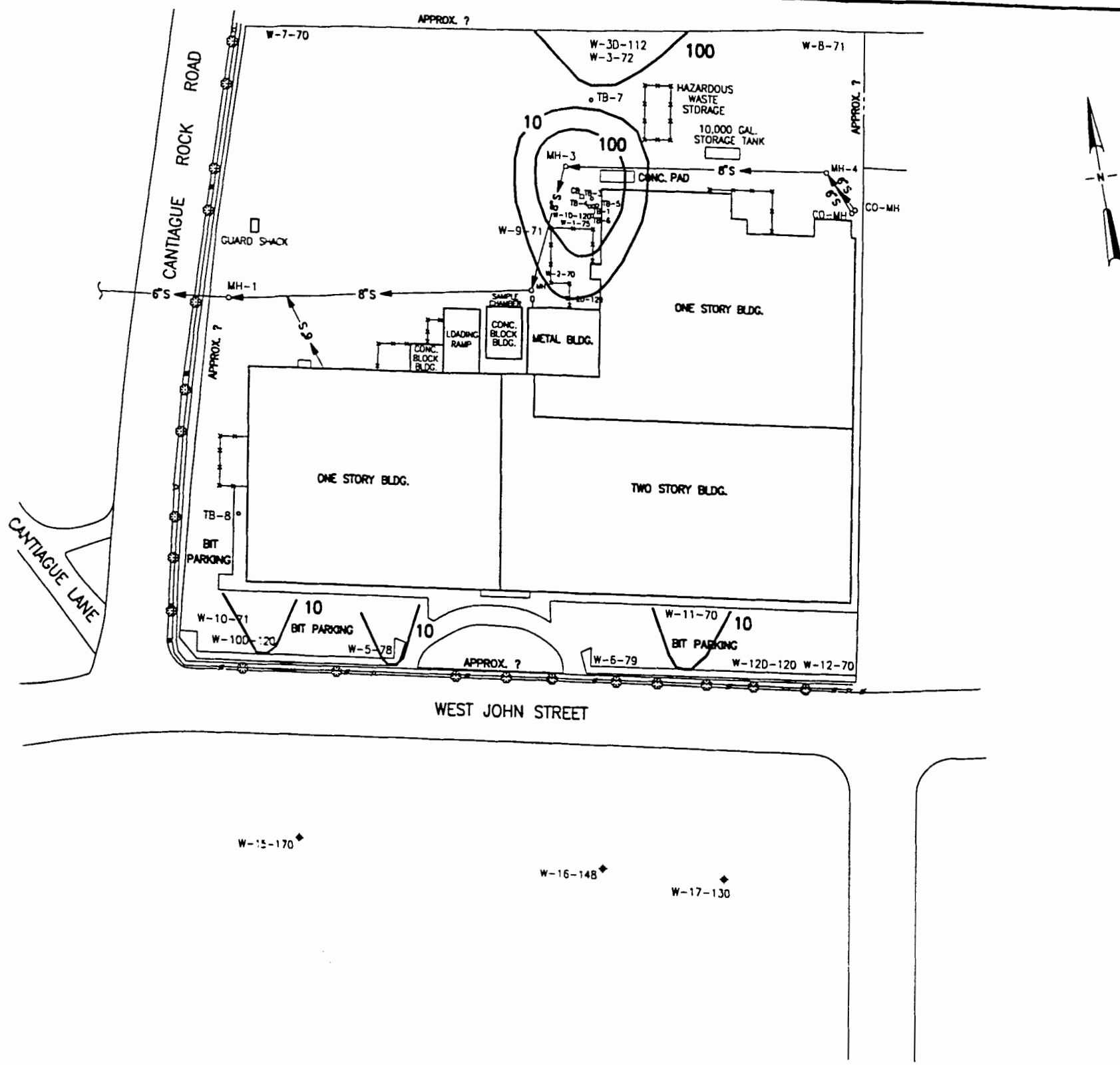
FIGURE 1-4
TETRACHLOROETHYLENE ISOPLETHS

N:\CADD\USE\41623\7-97\41623H97



WELL	CONCENTRATION (ug/l)
W-1-75	320
W-2-70	18
W-3-72	130
W-5-78	4
W-10-71	68
W-11-70	3

CI = ORDER OF MAGNITUDE
PCE (ppb)

1"=120'-0" 120 0 120 240

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FIGURE 1-5
TETRACHLOROETHYLENE ISOPLETHS
SHALLOW WELLS - 5/97

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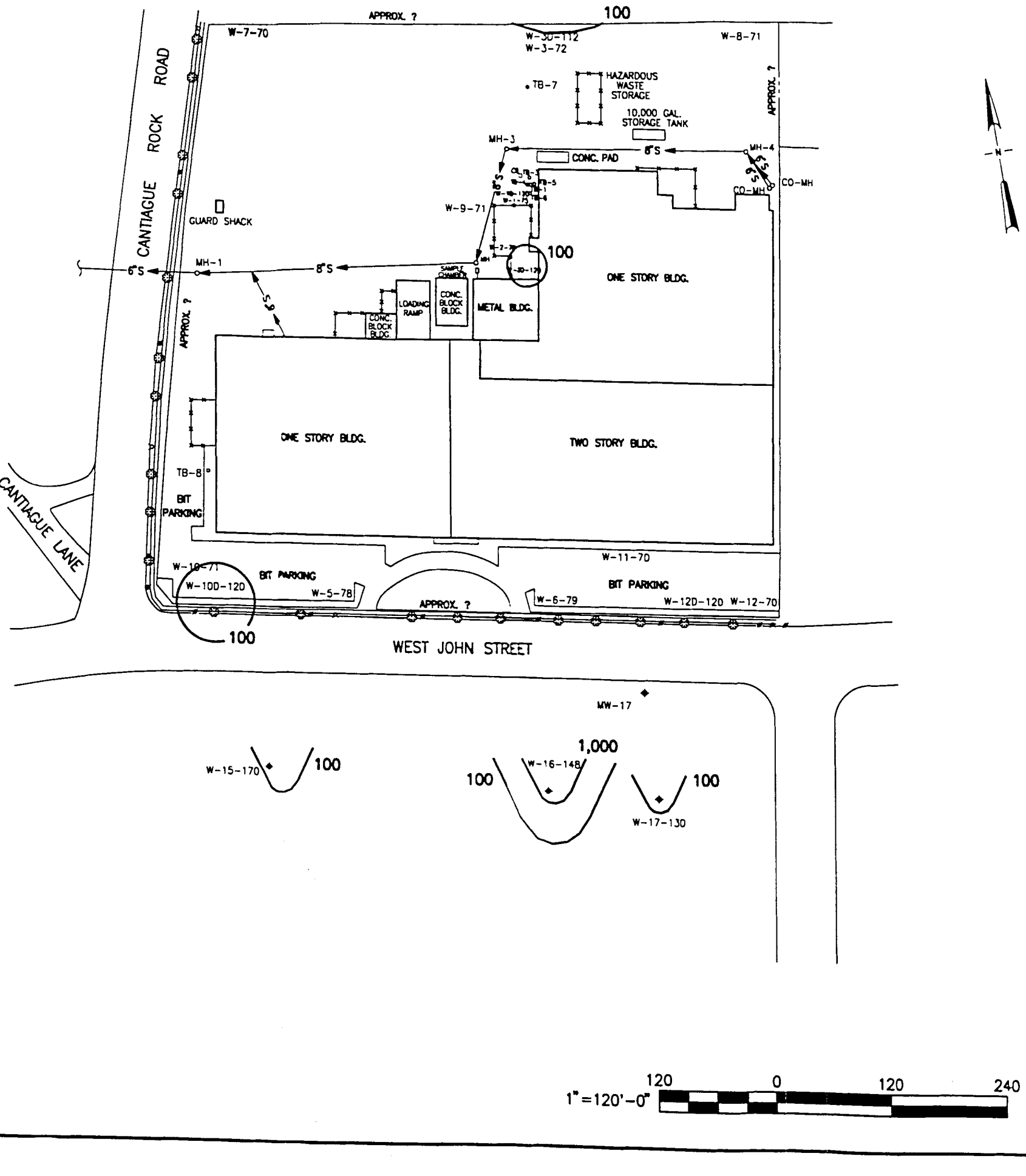

WELL	CONCENTRATION (ug/l)
W-1D-120	8
W-2D-120	385
W-3D-112	116
W-10D-120	19
MW-15	295
MW-16	1,360
MW-17	592

CI = ORDER OF MAGNITUDE
TOTAL VOCs (ppb)

1"=120'-0" 120 0 120 240

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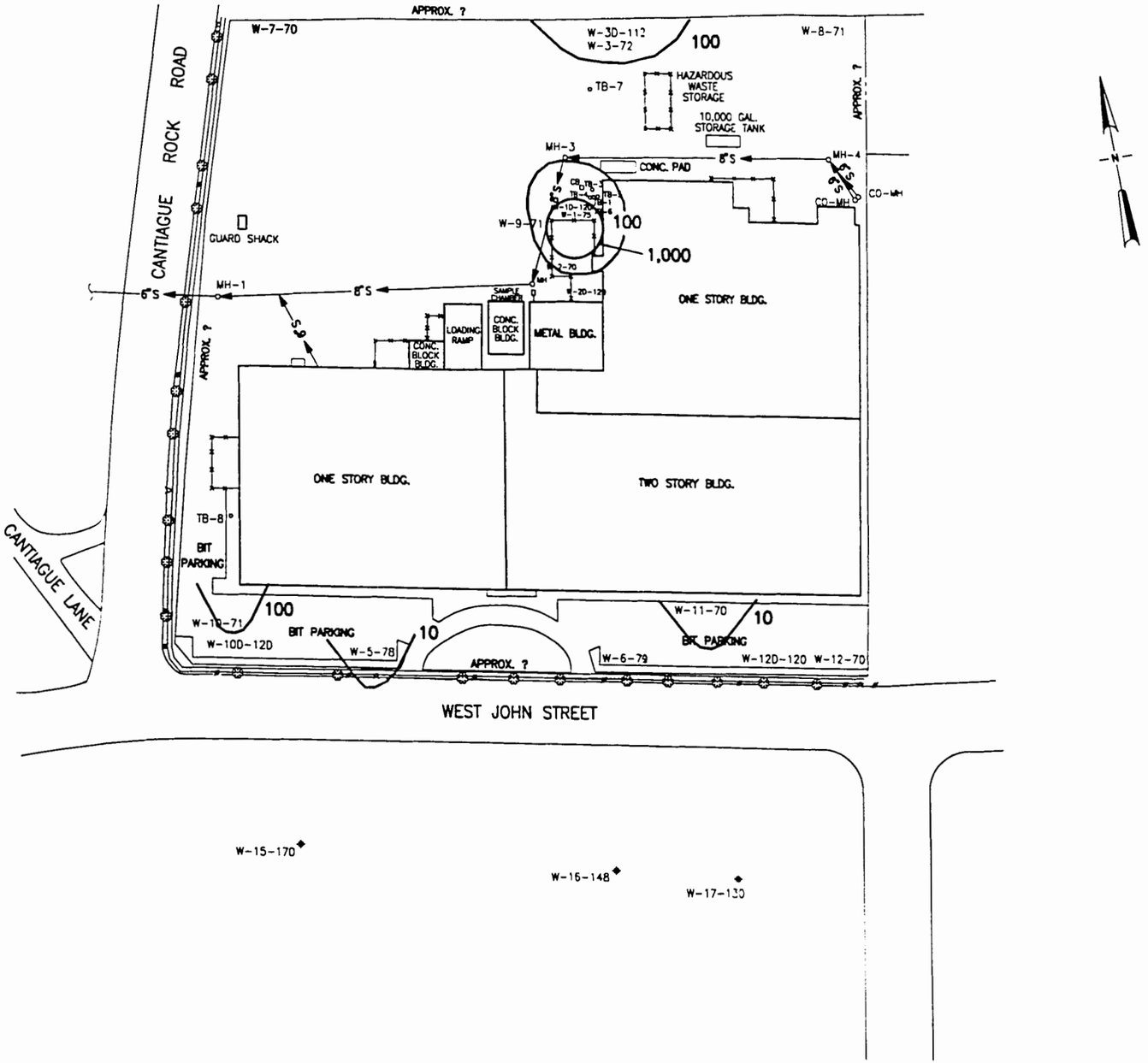
FIGURE 1-6
TOTAL VOCs ISOPLETHS
DEEP WELLS - 5/97



WELL	CONCENTRATION (ug/l)
W-1-75	8,720
W-2-70	80
W-3-72	142
W-5-78	31
W-10-71	268
W-11-70	17

CI = ORDER OF MAGNITUDE
TOTAL VOCs (ppb)

1" = 120'-0" 120 0 120 240

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DATE: 9/97 JOB No.: 41623ZA

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FIGURE 1-7
TOTAL VOCs ISOPLETHS
SHALLOW WELLS - 5/97

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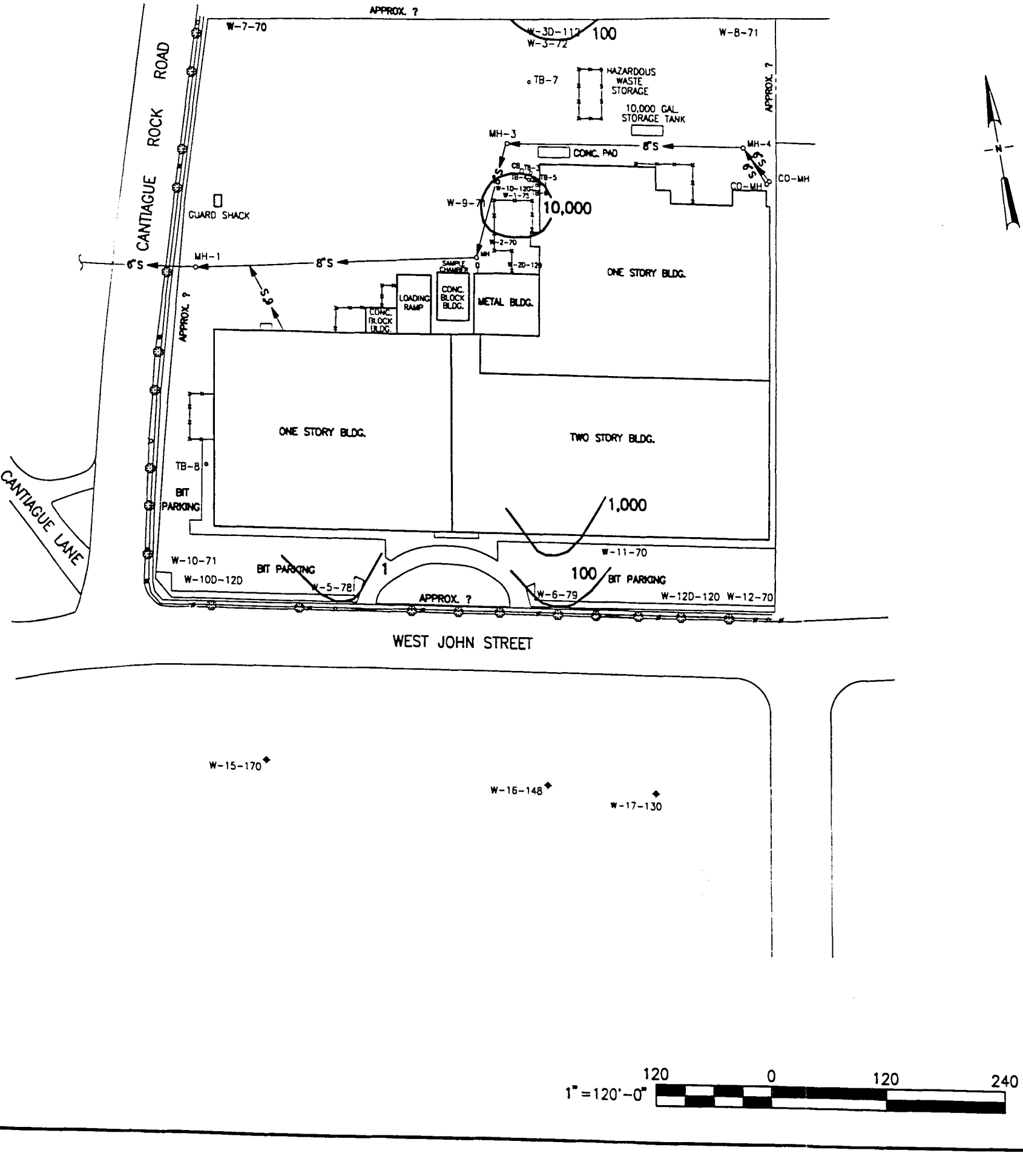

WELL	CONCENTRATION (ug/l)
W-1-75	13,000
W-3-72	47.6
W-5-78	2.9
W-6-79	263

CI = ORDER OF MAGNITUDE
TCE (ppb)

1" = 120'-0"

120 0 120 240

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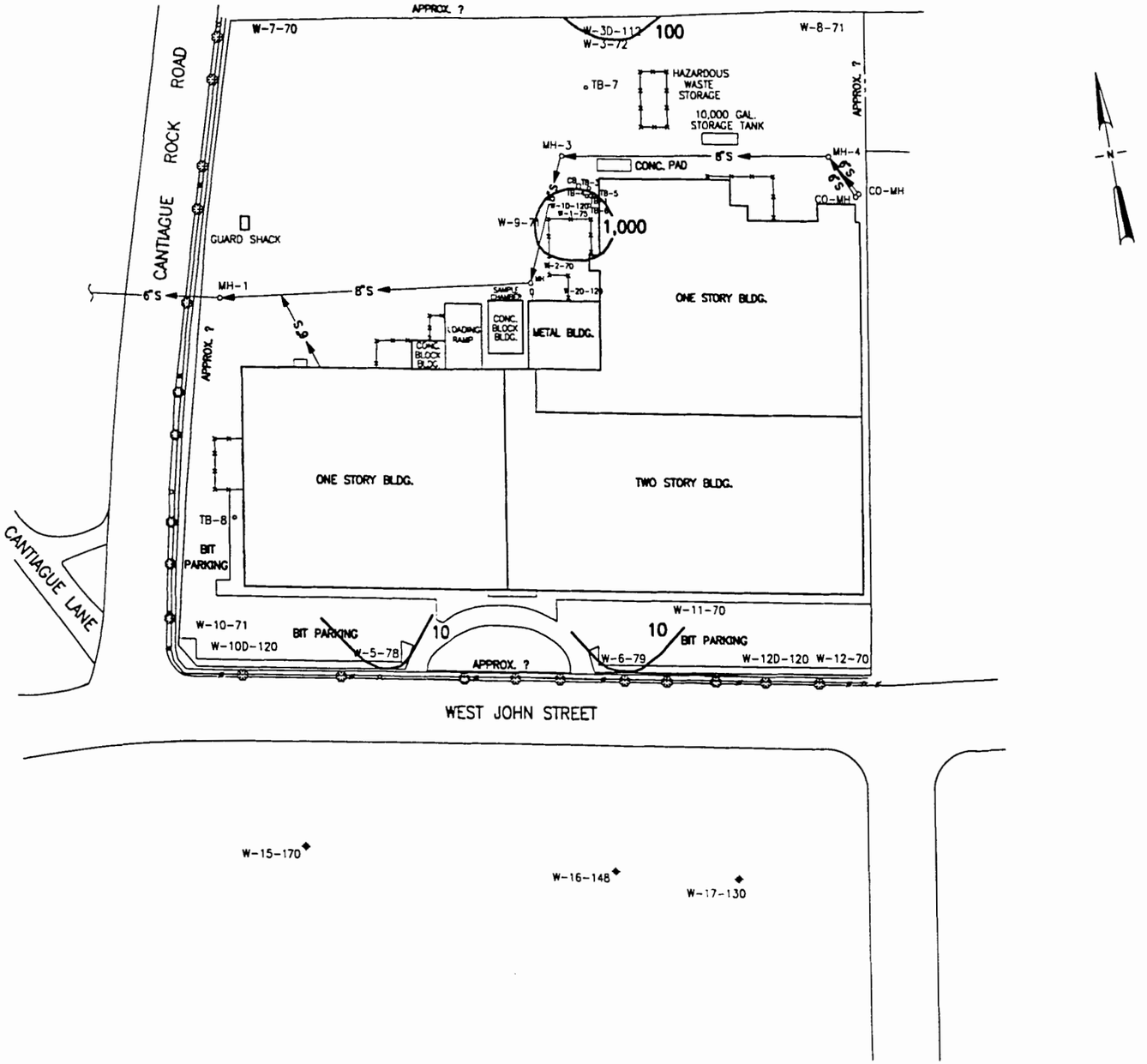
FIGURE 1-8
TRICHLOROETHYLENE ISOPLETHS
SHALLOW WELLS - 6/86



WELL	CONCENTRATION (ug/l)
W-1-75	1,030
W-3-72	491
W-5-78	11.3
W-6-79	45.4

CI = ORDER OF MAGNITUDE
PCE (ppb)

1"=120'-0" 120 0 120 240

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FIGURE 1-9
TETRACHLOROETHYLENE ISOPLETHS
SHALLOW WELLS - 6/86

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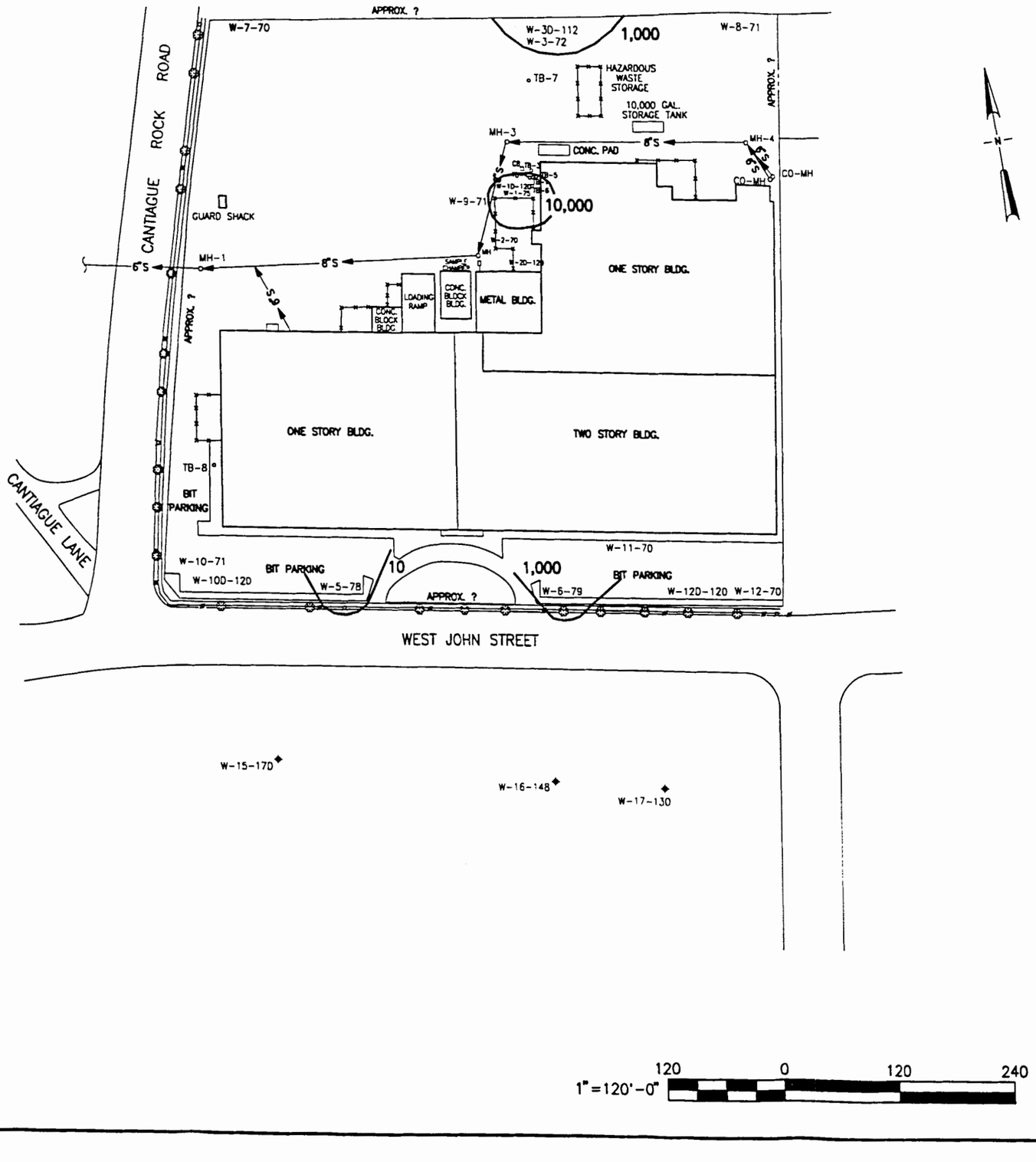

WELL	CONCENTRATION (ug/l)
W-1-75	43,848
W-3-72	963.6
W-5-78	44.2
W-6-79	1,584.3

CI = ORDER OF MAGNITUDE
TOTAL VOCs (ppb)

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FIGURE 1-10
TOTAL VOCs ISOPLETHS
SHALLOW WELLS - 6/86

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WELL	CONCENTRATION (ug/l)
W-3-72	306
W-5-78	9.78
W-6-79	1.71

CI = ORDER OF MAGNITUDE
TCE (ppb)

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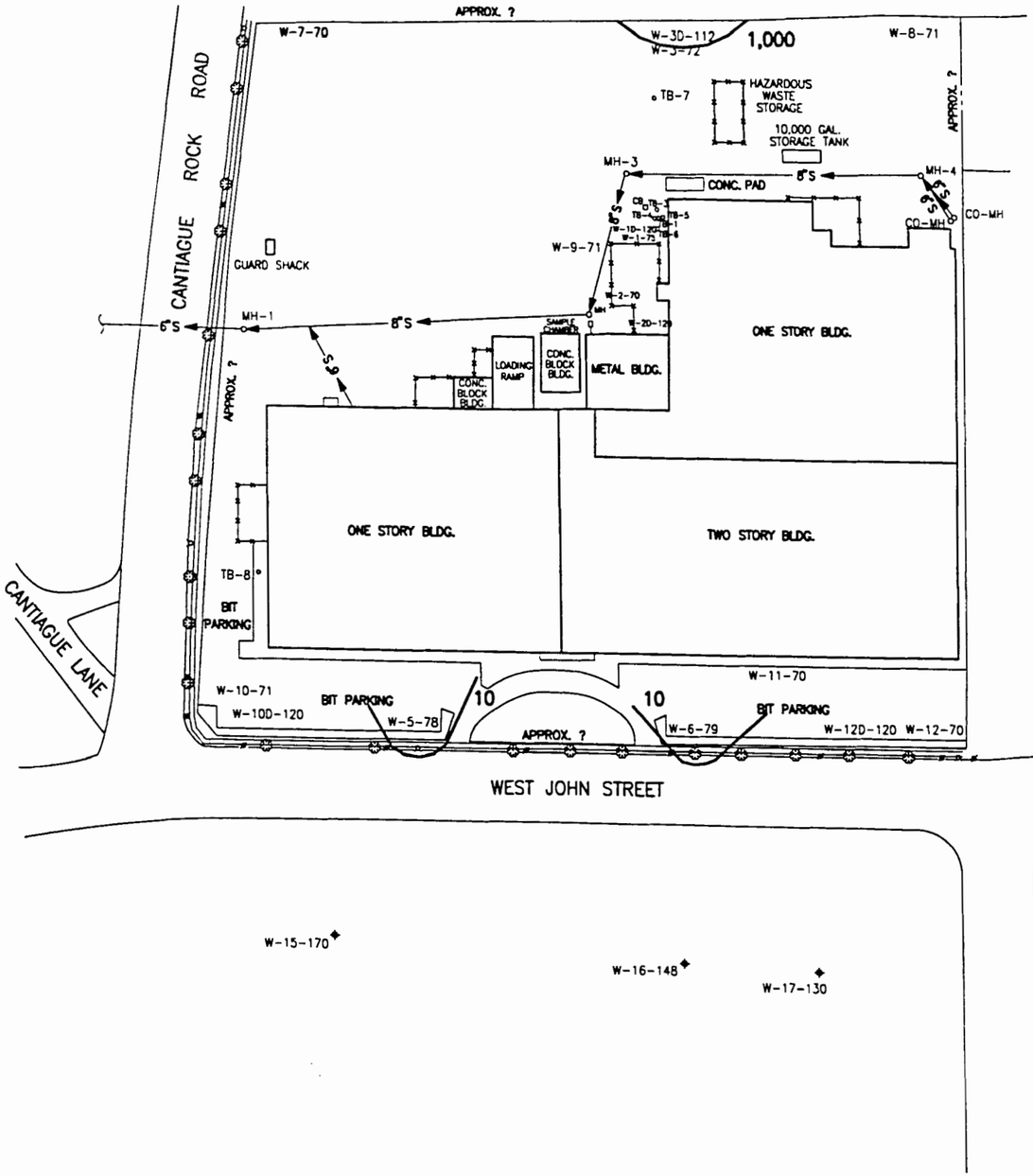
FIGURE 1-11
TRICHLOROETHYLENE ISOPLETHS
SHALLOW WELLS - 7/87

N:\CADUSE\#1623\7-97\16233587



WELL	CONCENTRATION (ug/l)
W-3-72	2,512
W-5-78	30
W-6-79	30

CI = ORDER OF MAGNITUDE
TOTAL VOCs (ppb)

1"=120'-0" 120 0 120 240

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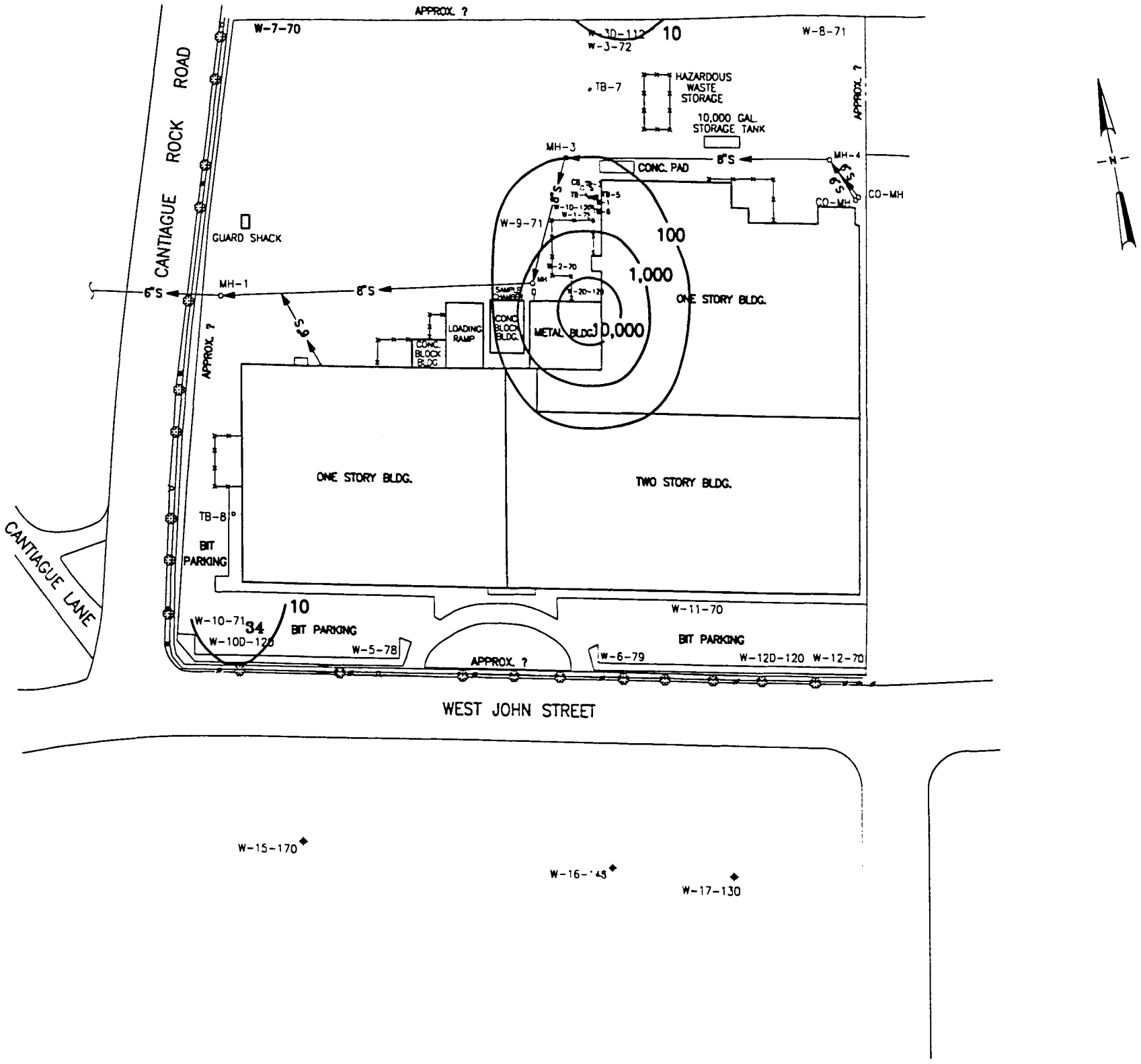
FIGURE 1-12
TOTAL VOCs ISOPLETHS
SHALLOW WELLS - 7/87

N:\CADUSE\#1623\7-97\1623VS87



WELL	CONCENTRATION (ug/l)
W-3D-112	19
W-1D-120	210
W-2D-120	12,000
W-10D-120	34
W-12D-120	ND

CI = ORDER OF MAGNITUDE
TCE (ppb)

1"=120'-0"

120 0 120 240

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FIGURE 1-13
TRICHLOROETHYLENE ISOPLETHS
DEEP WELLS - 4/30/91

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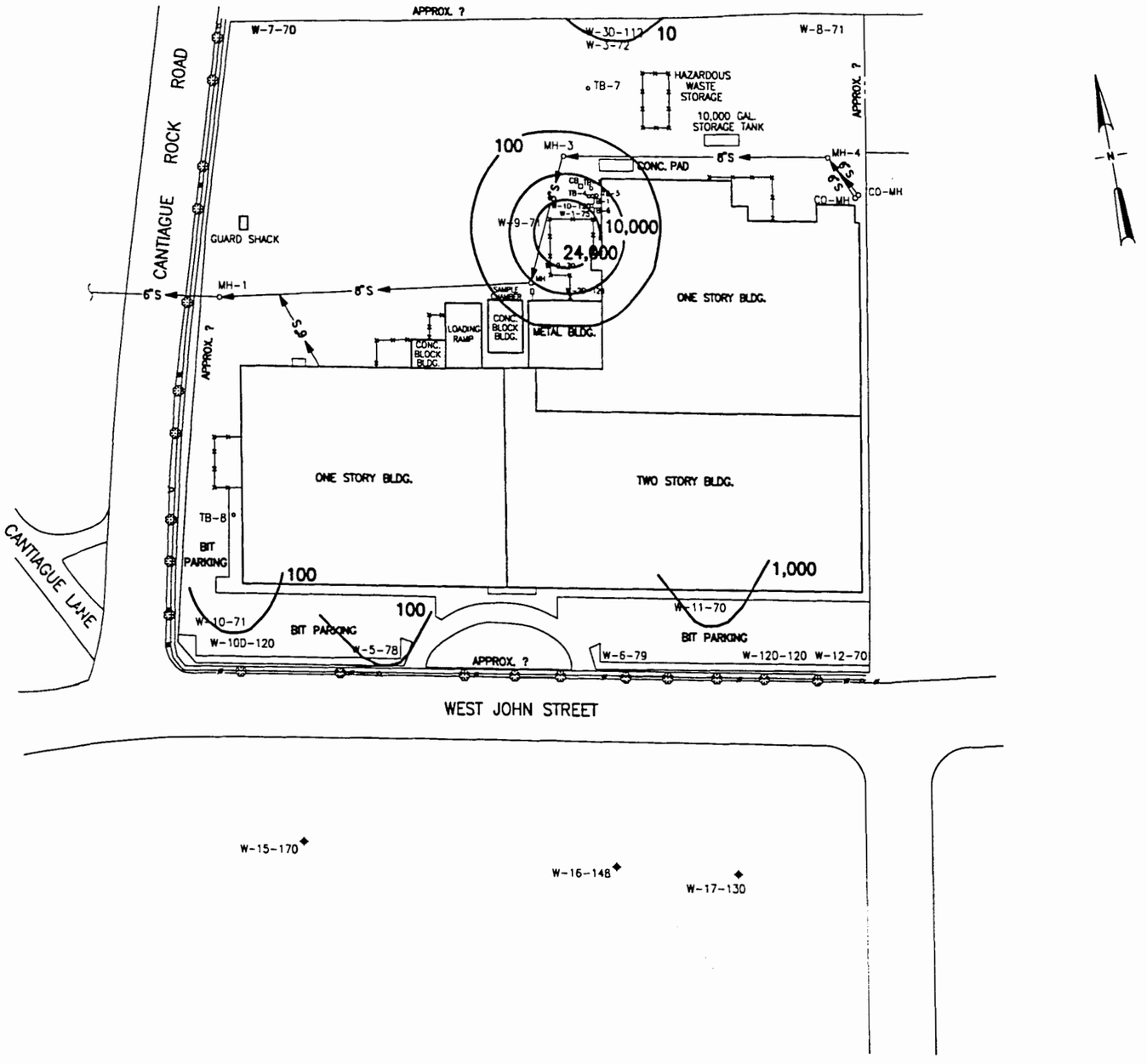

WELL	CONCENTRATION (ug/l)
W-1-75	48,000
W-2-70	1,400
W-3-72	62
W-5-78	180
W-9-71	24,000
W-10-71	700
W-11-71	1,900

CI = ORDER OF MAGNITUDE
TCE (ppb)

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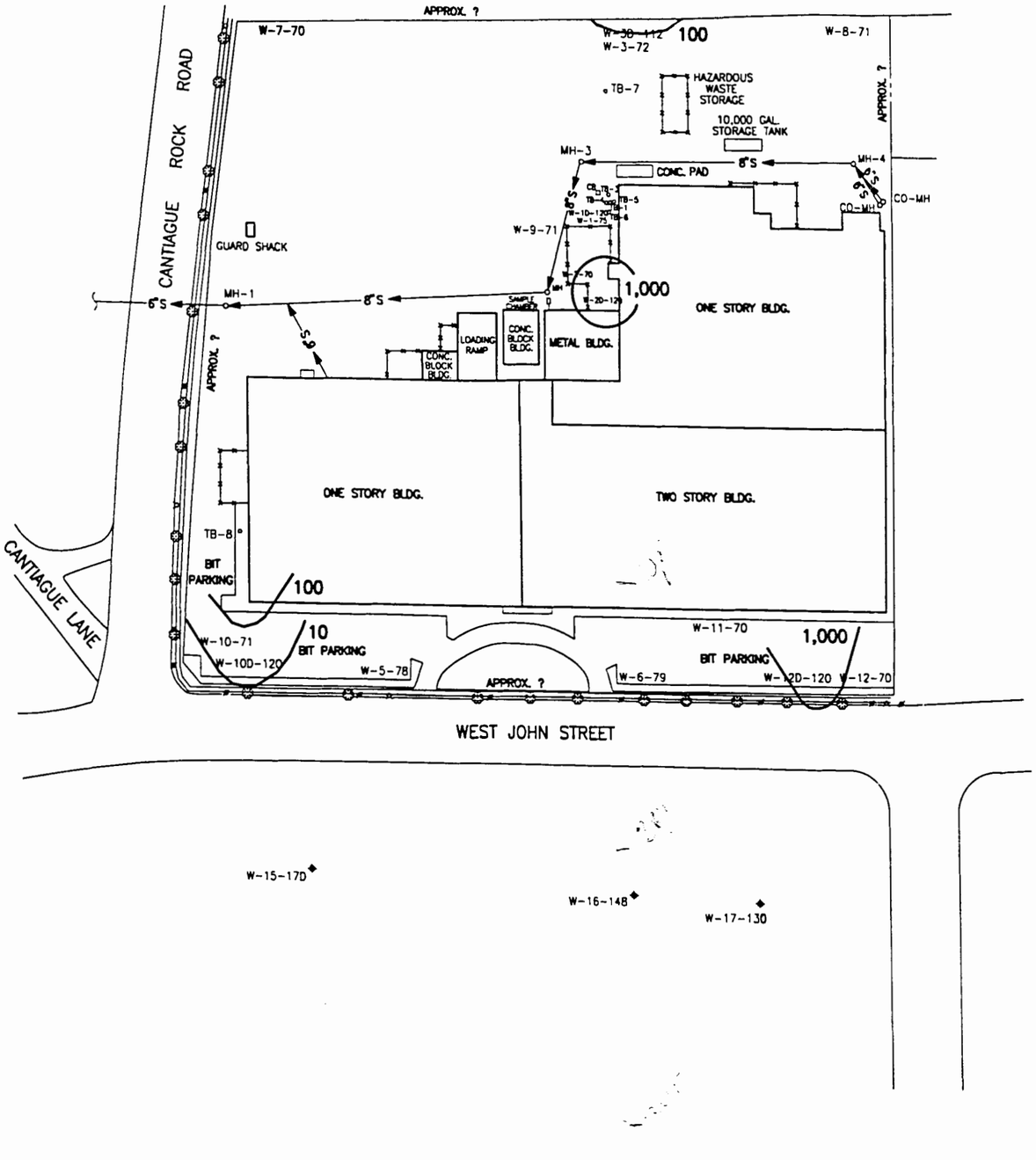
HICKSVILLE, NEW YORK

FIGURE 1-14
TRICHLOROETHYLENE ISOPLETHS
SHALLOW WELLS - 4/30/91



WELL	CONCENTRATION (ug/l)
W-2D-120	1,000
W-3D-112	310
W-10D-120	35
W-12D-120	1,700

CI = ORDER OF MAGNITUDE
PCE (ppb)

1" = 120'-0" 120 0 120 240

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FIGURE 1-15
TETRACHLOROETHYLENE ISOPLETHS
DEEP WELLS -4/30/91

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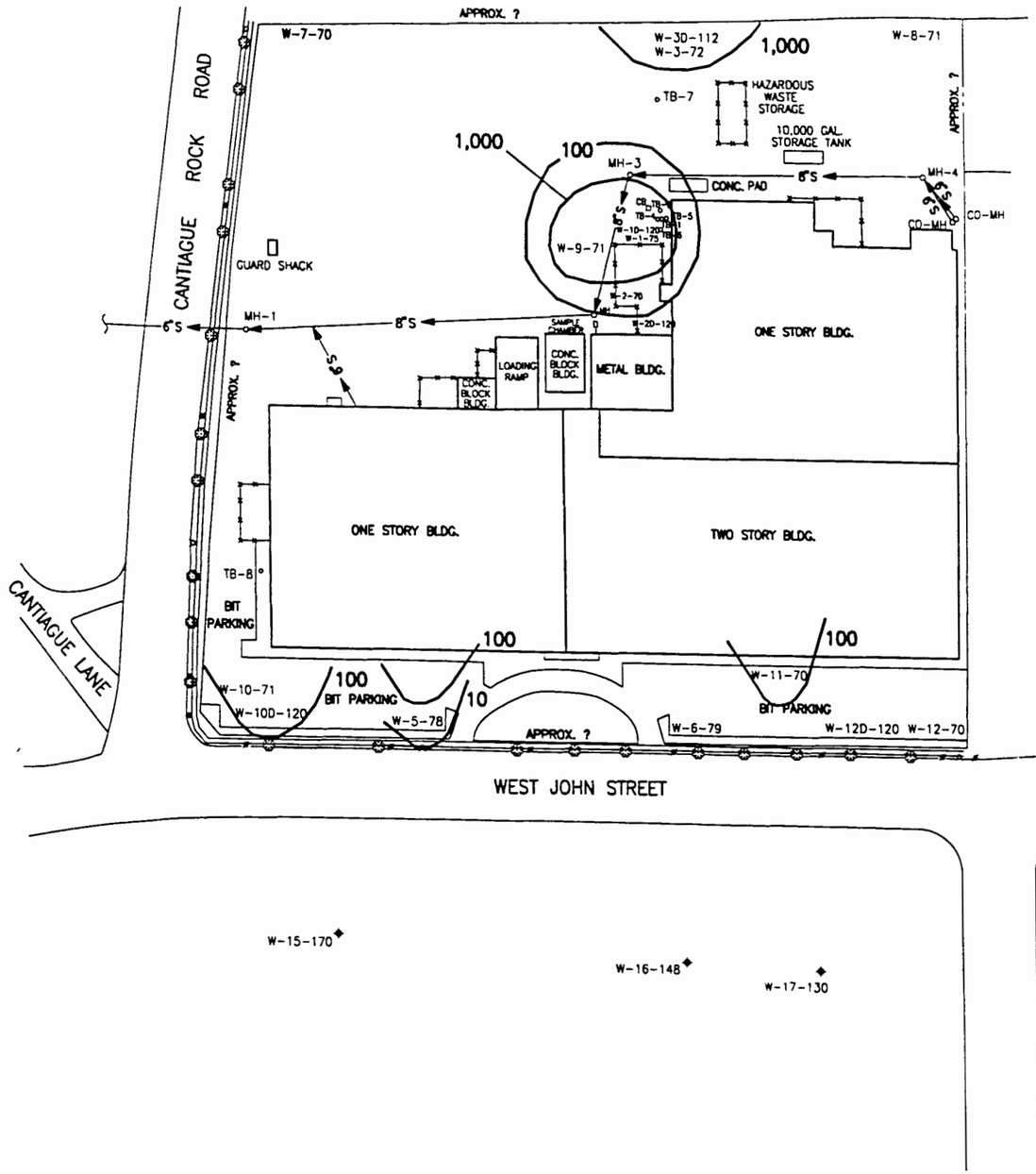

WELL	CONCENTRATION (ug/l)
W-1-75	4,000
W-2-70	250
W-3-72	690
W-5-78	22
W-9-71	1,900
W-10-71	240
W-11-71	380

CI = ORDER OF MAGNITUDE
PCE (ppb)

1"=120'-0" 120 0 120 240

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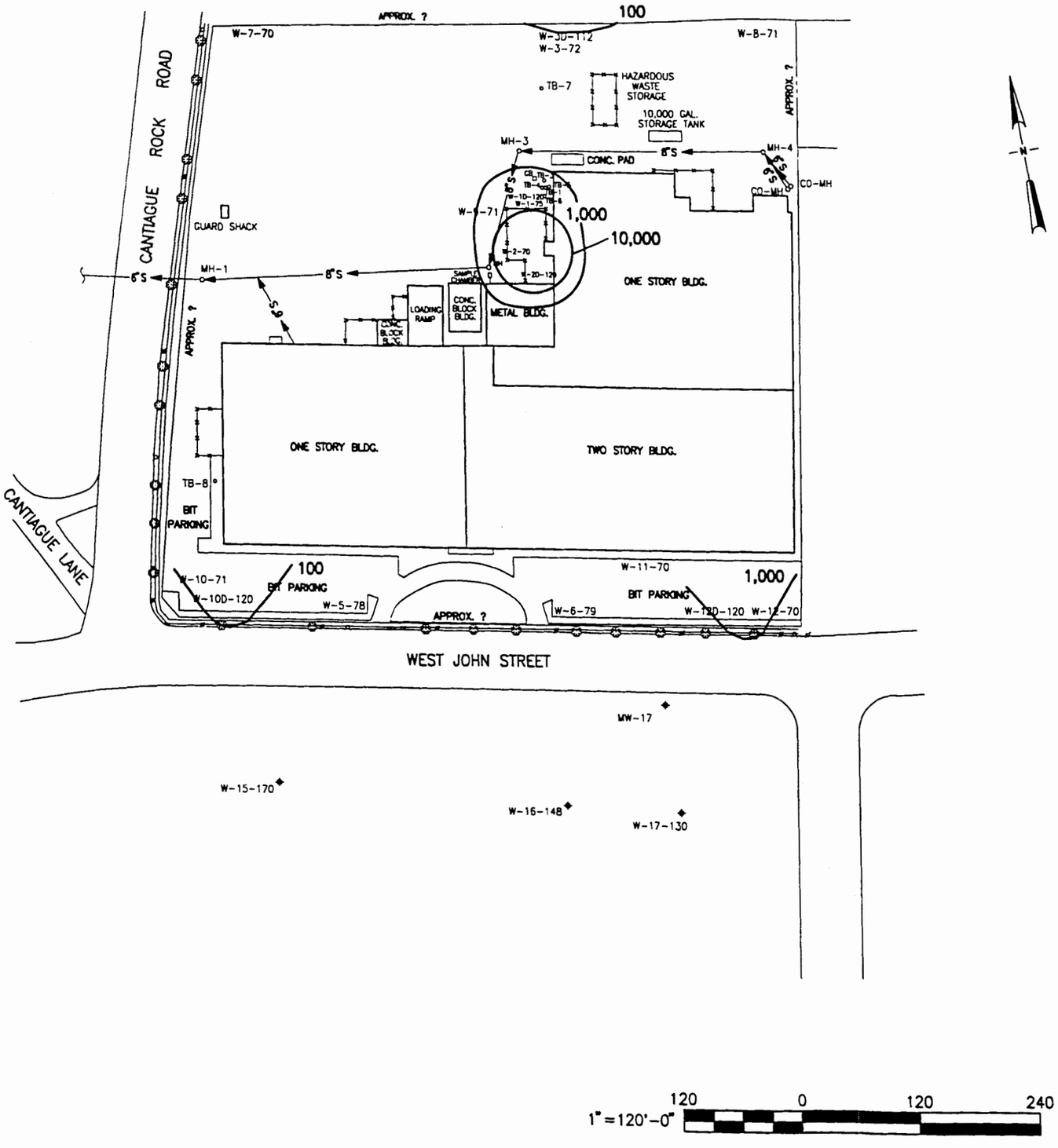
FIGURE 1-16
TETRACHLOROETHYLENE ISOPLETHS
SHALLOW WELLS - 4/30/91



WELL	CONCENTRATION (ug/l)
W-1D-120	1,373
W-2D-120	17,470
W-3D-112	329
W-10D-120	89
W-12D-120	1,700

CI = ORDER OF MAGNITUDE
TOTAL VOCs (ppb)

1"=120'-0" 120 0 120 240

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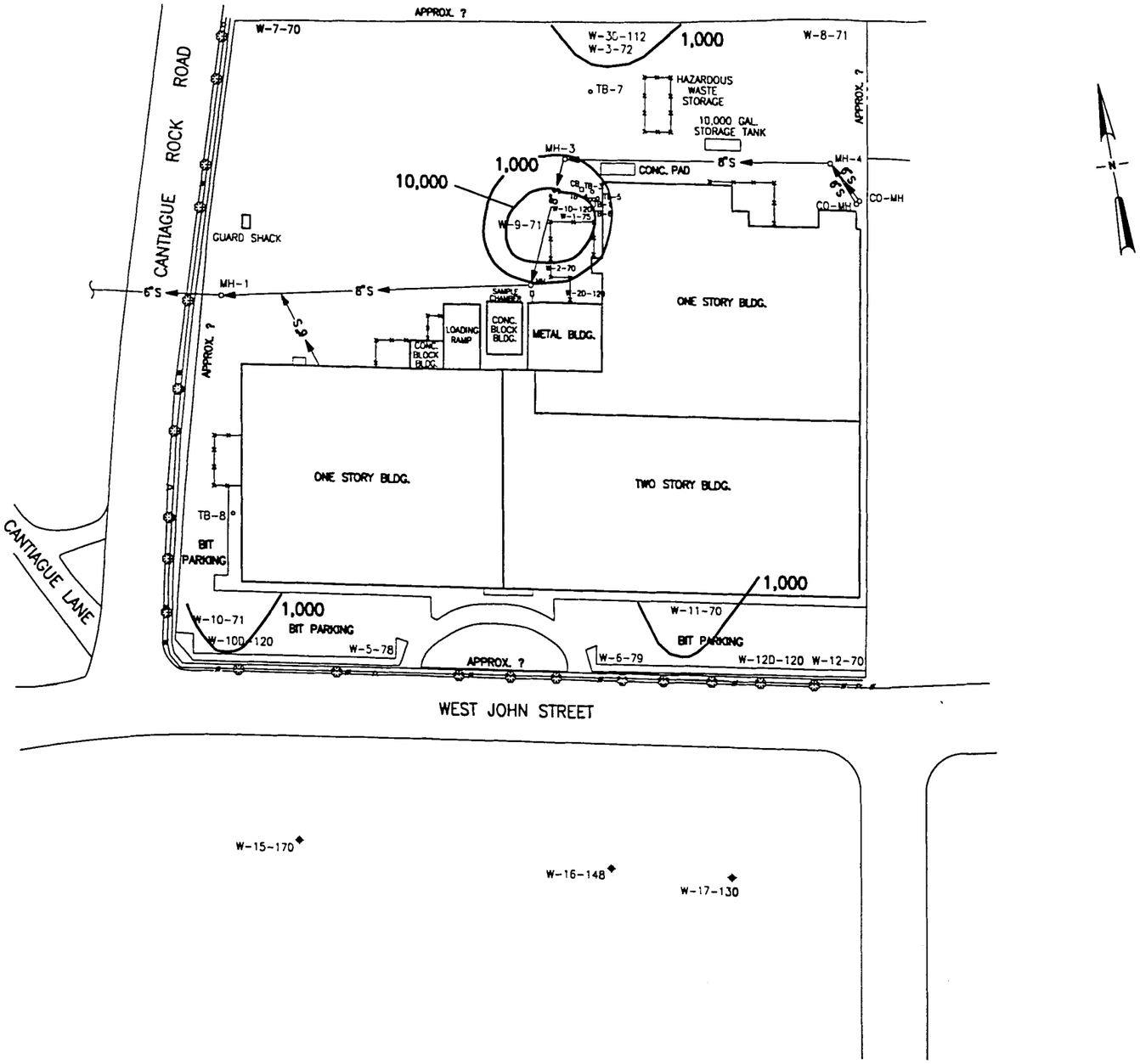
FIGURE 1-17
TOTAL VOCs ISOPLETHS
DEEP WELLS - 4/30/91



WELL	CONCENTRATION (ug/l)
W-1-75	93,300
W-2-70	1,723
W-3-72	790
W-9-71	25,900
W-10-71	1,150
W-11-70	2,280

CI = ORDER OF MAGNITUDE
TOTAL VOCs (ppb)

1"=120'-0"

120 0 120 240

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FIGURE 1-18
TOTAL VOCs ISOPLETHS
SHALLOW WELLS - 4/30/91

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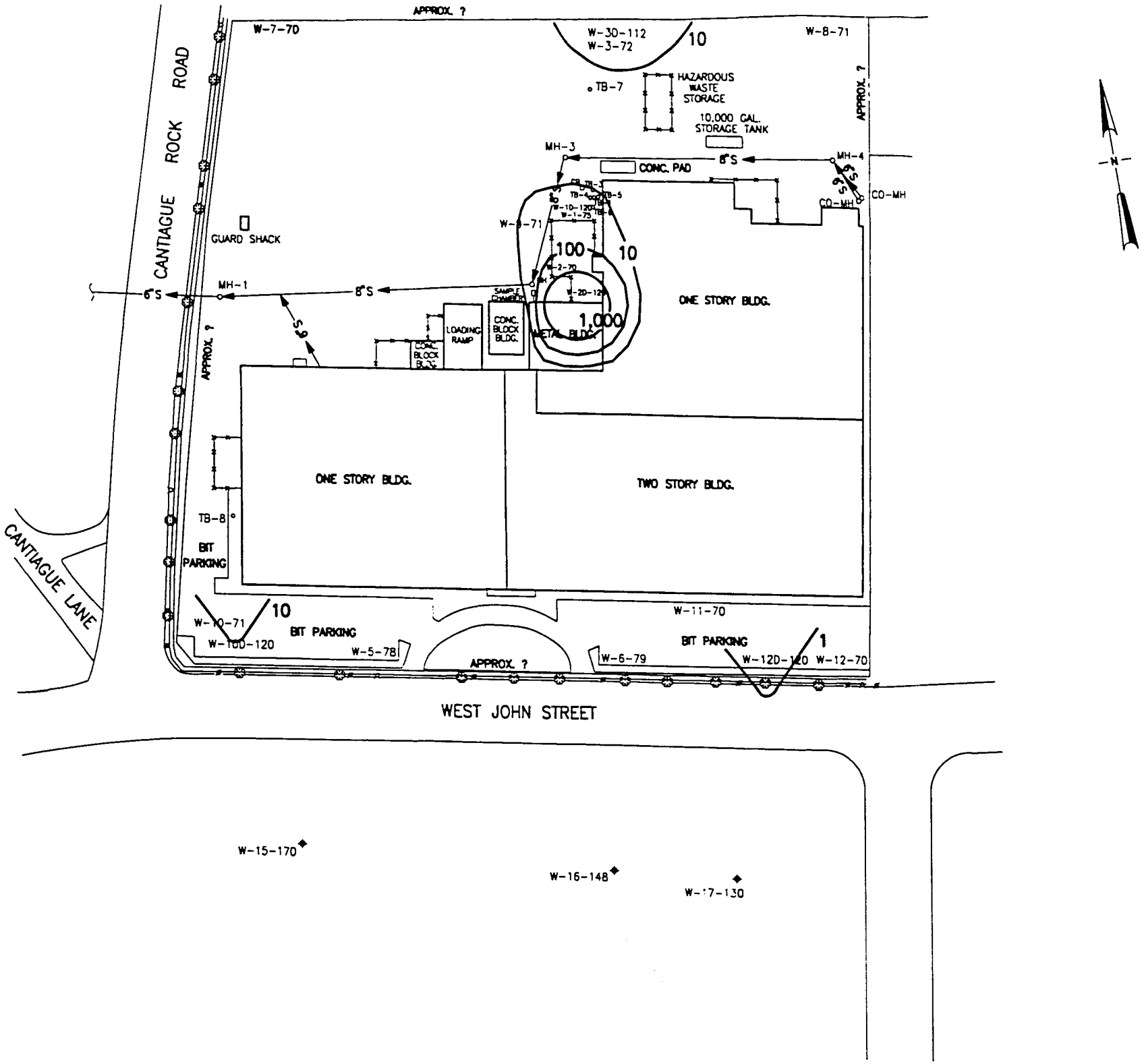

WELL	CONCENTRATION (ug/l)
W-1D-120	69
W-2D-120	2,800
W-3D-112	12
W-10D-120	10
W-12D-120	3

CI = ORDER OF MAGNITUDE
TCE (ppb)

1"=120'-0" 120 0 120 240

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FIGURE 1-19
TRICHLOROETHYLENE ISOPLETHS
DEEP WELLS – 12/15/94

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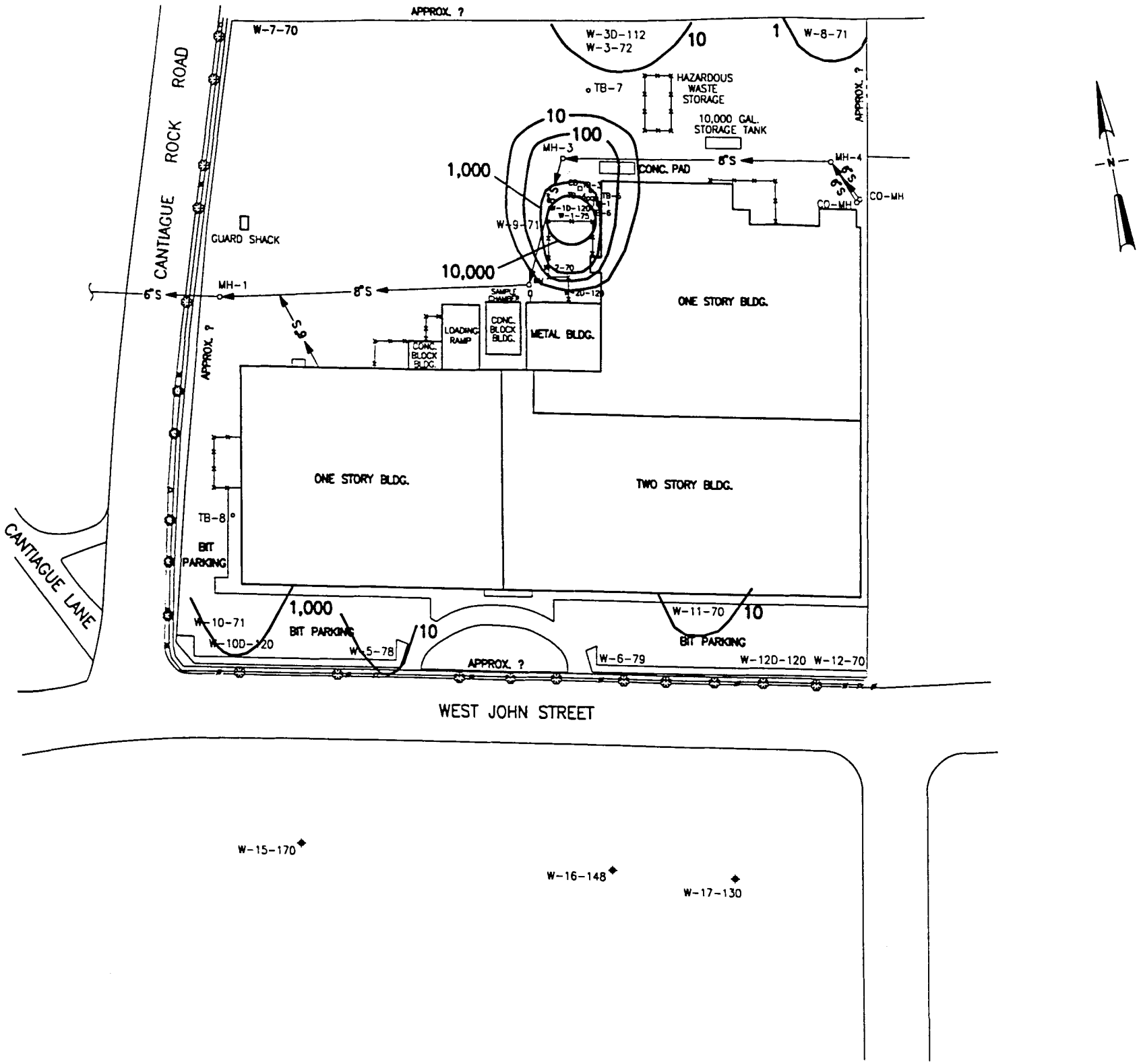

WELL	CONCENTRATION (ug/l)
W-1-75	14,000
W-2-70	2,700
W-3-72	12
W-5-78	86
W-8-71	2
W-9-71	69
W-10-71	1,700
W-11-70	13

CI = ORDER OF MAGNITUDE
TCE (ppb)

1"=120'-0"

120 0 120 240

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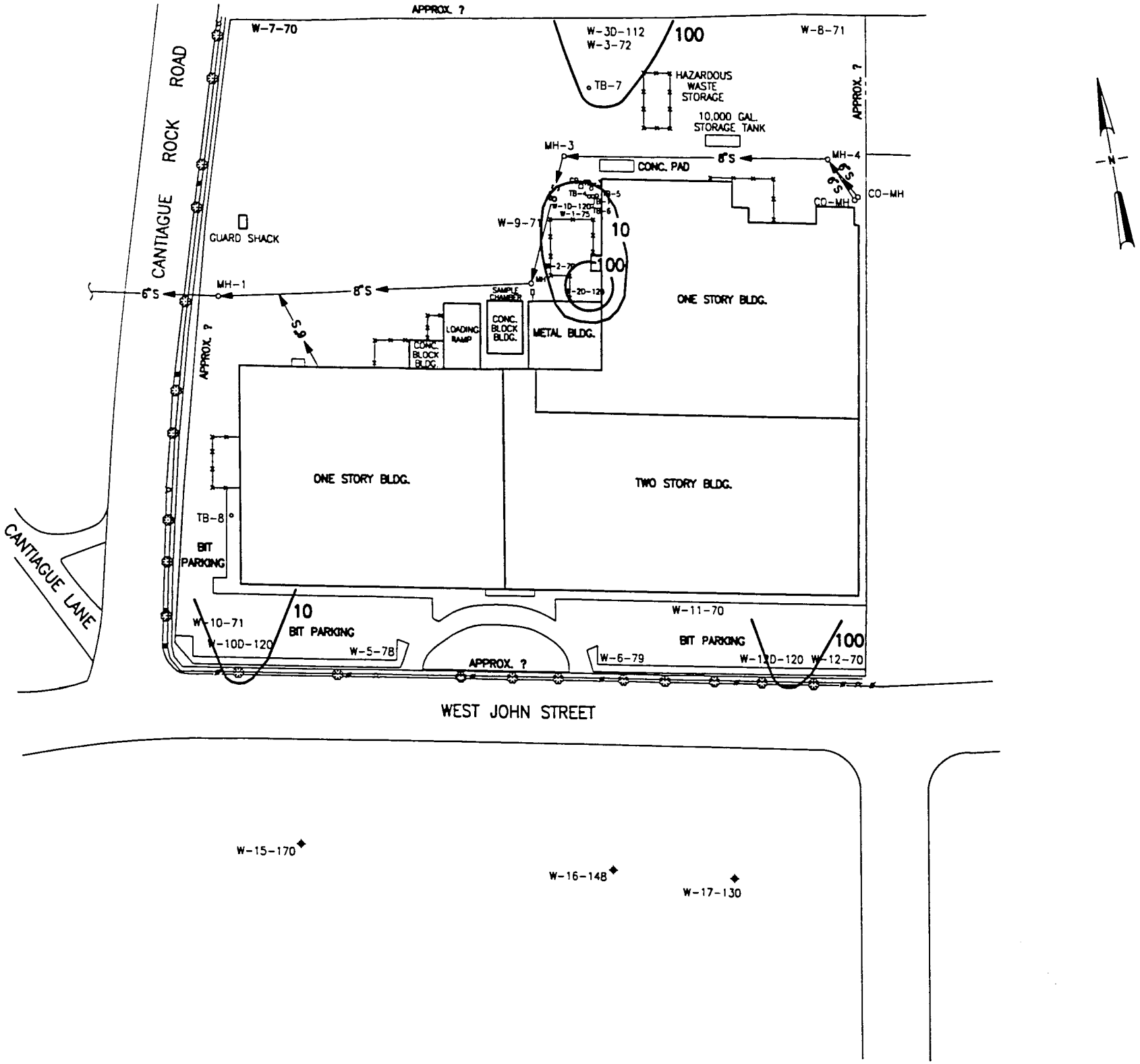
FIGURE 1-20
TRICHLOROETHYLENE ISOPLETHS
SHALLOW WELLS - 12/15/94

N:\CADUSE\41623\7-97\162.35334



WELL	CONCENTRATION (ug/l)
W-1D-120	20
W-2D-120	230
W-3D-112	140
W-10D-120	19
W-12D-120	780

CI = ORDER OF MAGNITUDE
PCE (ppb)

1"=120'-0" 120 0 120 240

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FIGURE 1-21
TETRACHLOROETHYLENE ISOPLETHS
DEEP WELLS – 12/15/94

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WELL	CONCENTRATION (ug/l)
W-1-75	1,800
W-2-70	250
W-3-72	140
W-5-78	14
W-7-70	69
W-8-71	41
W-9-71	80
W-10-71	180
W-11-70	2
W-12-70	–

CI = ORDER OF MAGNITUDE
PCE (ppb)

1"=120'-0" 120 0 120 240

N:\CADUSE\#1623\7-97\16234594

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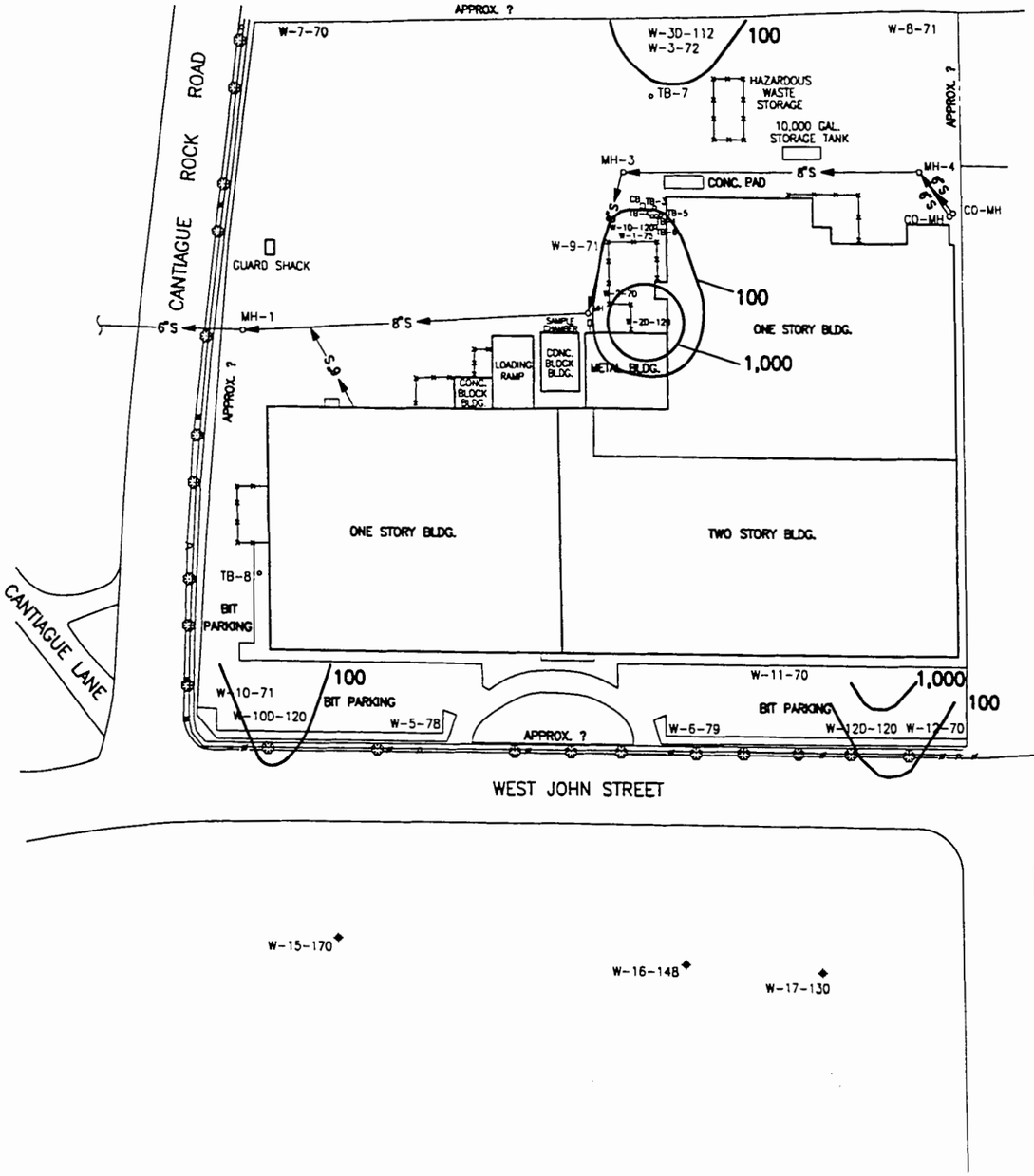
FIGURE 1-22
TETRACHLOROETHYLENE ISOPLETHS
SHALLOW WELLS – 12/15/94



WELL	CONCENTRATION (ug/l)
W-1D-120	579
W-2D-120	4,130
W-3D-112	225
W-10D-120	466
W-12D-120	783

CI = ORDER OF MAGNITUDE
TOTAL VOCs (ppb)

1"=120'-0" 120 0 120 240

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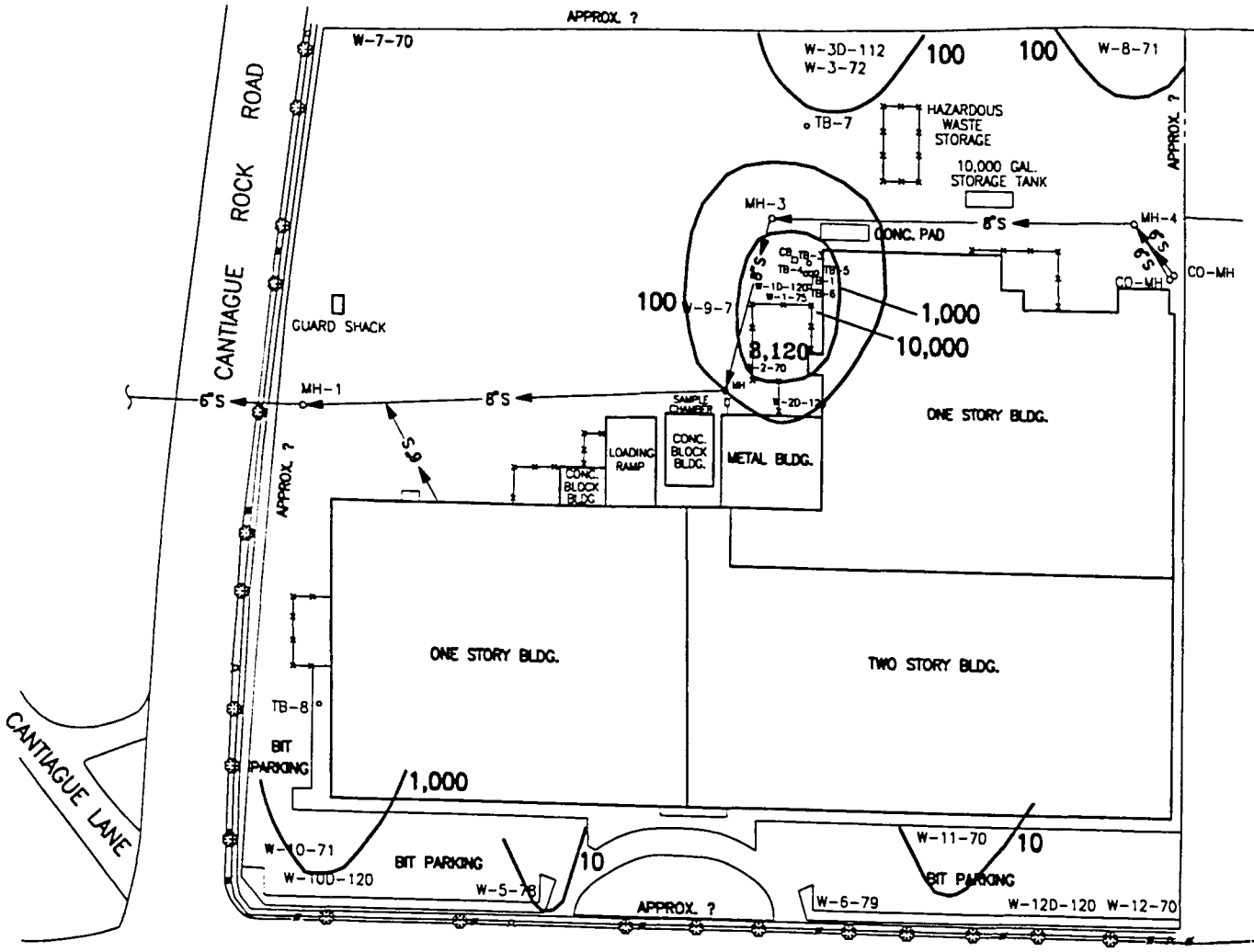
ENVIRONMENTAL ENGINEERS & SCIENTISTS
CAZENOVIA, NEW YORK

DATE: 9/97 JOB No.: 41623ZA

GENERAL INSTRUMENT CORPORATION
600 WEST JOHN STREET
HICKSVILLE, NEW YORK

FIGURE 1-23
TOTAL VOCs ISOPLETHS
DEEP WELLS - 12/15/94

N:\CADD\41623\1-97\41623V094



WELL	CONCENTRATION (ug/l)
W-1-75	48,083
W-2-70	3,120
W-3-72	159
W-5-78	86
W-7-70	24,069
W-8-71	413
W-9-71	149
W-10-71	1,880
W-11-70	13

CI = ORDER OF MAGNITUDE
TOTAL VOCs (ppb)

1"=120'-0"

120 0 120 240

Stearns & Wheler, LLC
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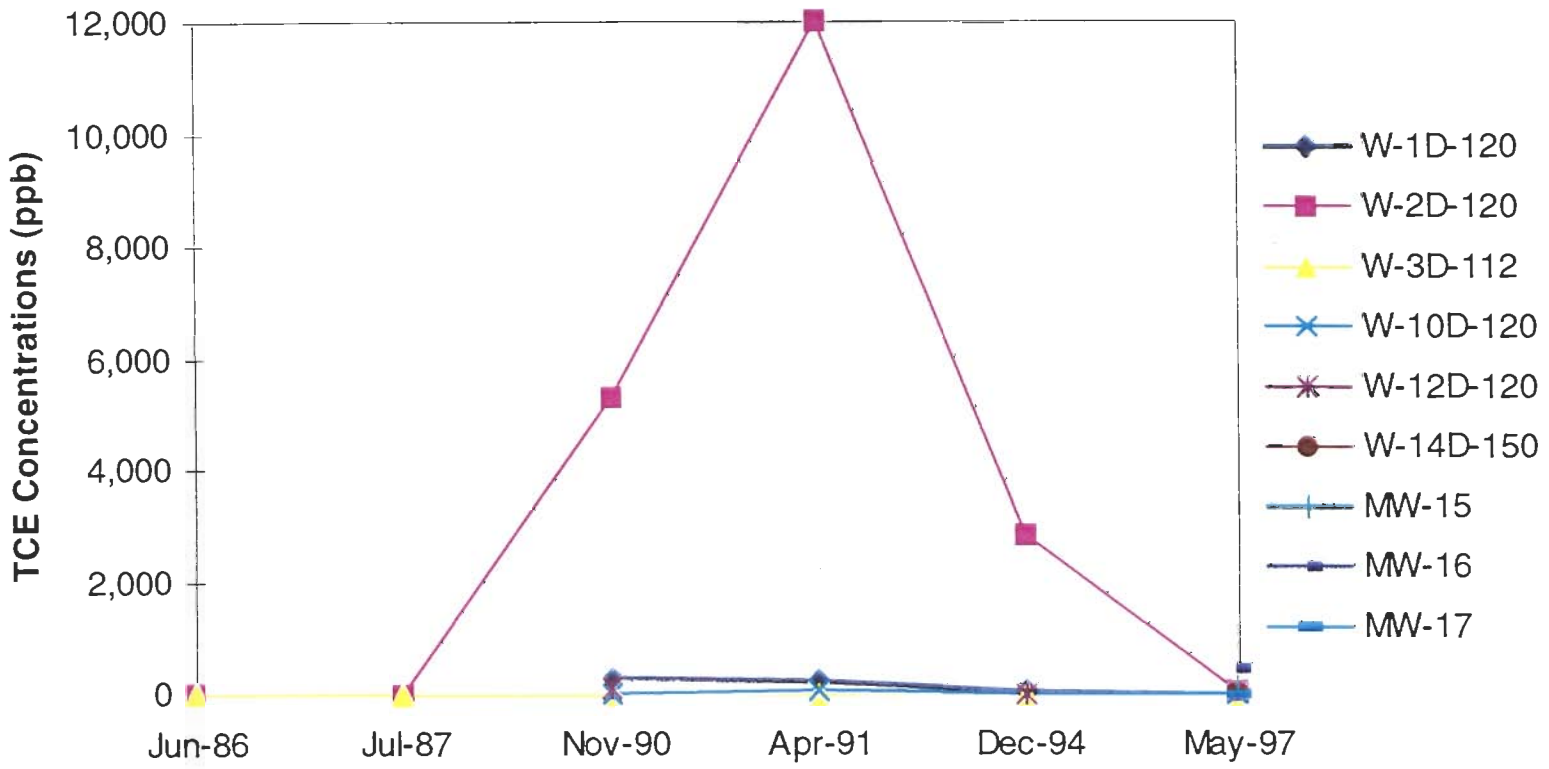
CAZENOVIA, NEW YORK

DATE: 9/97 JOB No.: 416232A

GENERAL INSTRUMENT CORPORATION
600 WEST JOHN STREET
HICKSVILLE, NEW YORK

FIGURE 1-24
TOTAL VOCs ISOPLETHS
SHALLOW WELLS - 12/15/94



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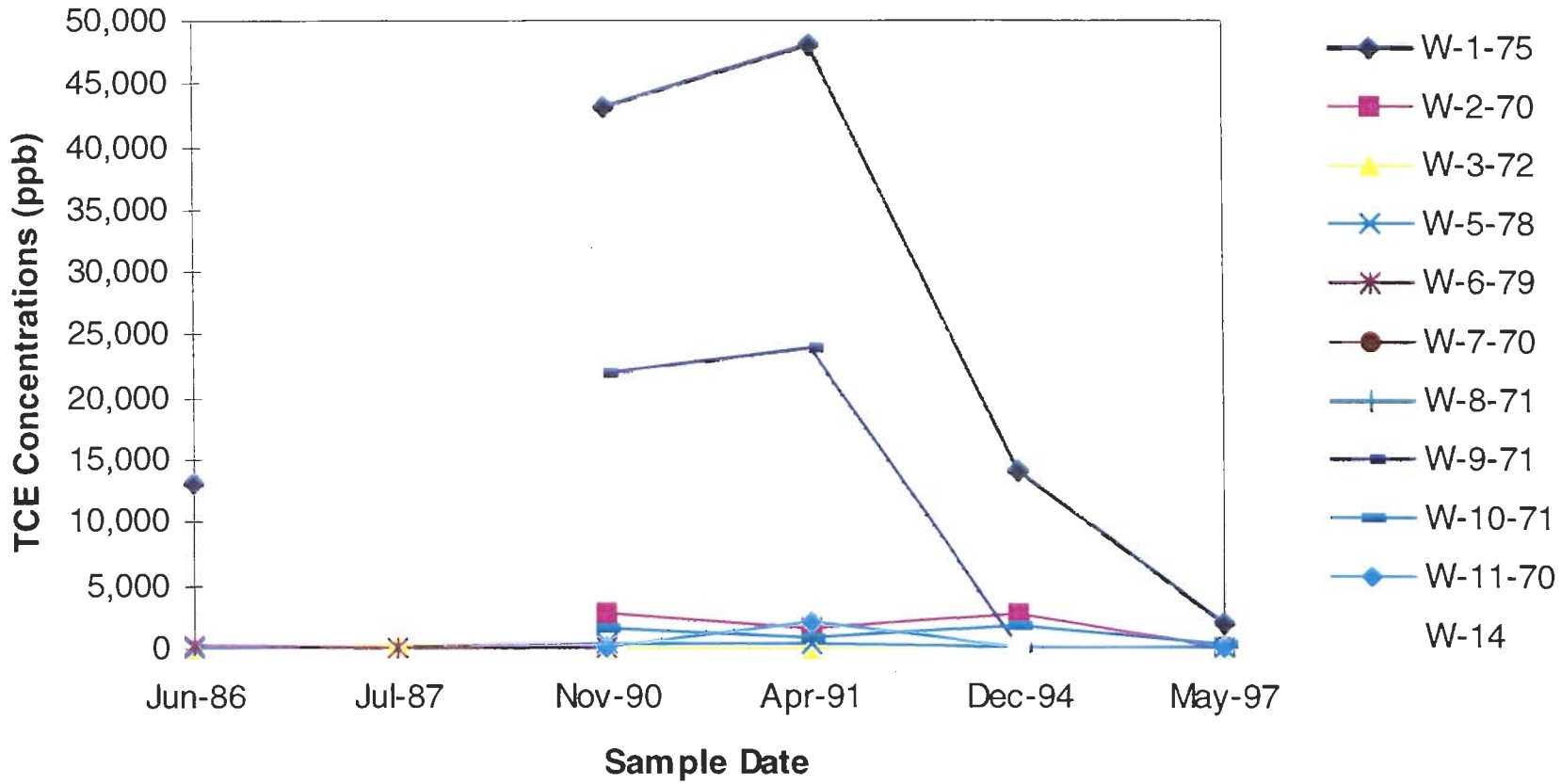
CAZENOVIA, NEW YORK
DATE: 7/97 JOB No.: 41623ZA

REMEDIAL INVESTIGATION / FEASIBILITY STUDY
HICKSVILLE, NEW YORK

FIGURE 1- 25
Trichloroethene (TCE) Concentrations in Groundwater from Deep Wells



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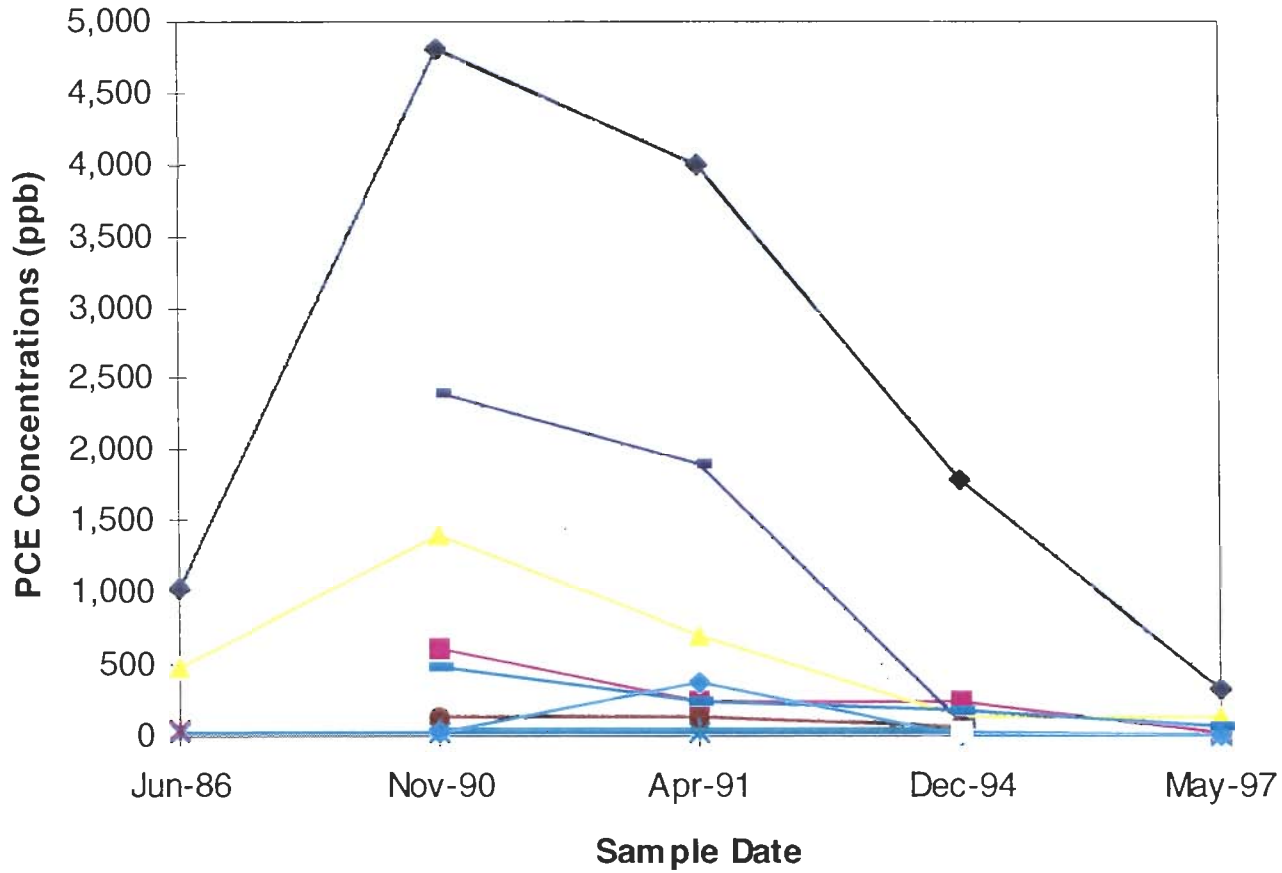
CAZENOVIA, NEW YORK
DATE: 7/97 JOB No.: 41623ZA

REMEDIAL INVESTIGATION / FEASIBILITY STUDY
HICKSVILLE, NEW YORK

FIGURE 1- 26
Trichloroethene (TCE) Concentrations in Groundwater from Shallow Wells



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DATE: 7/97 JOB No.: 41623ZA

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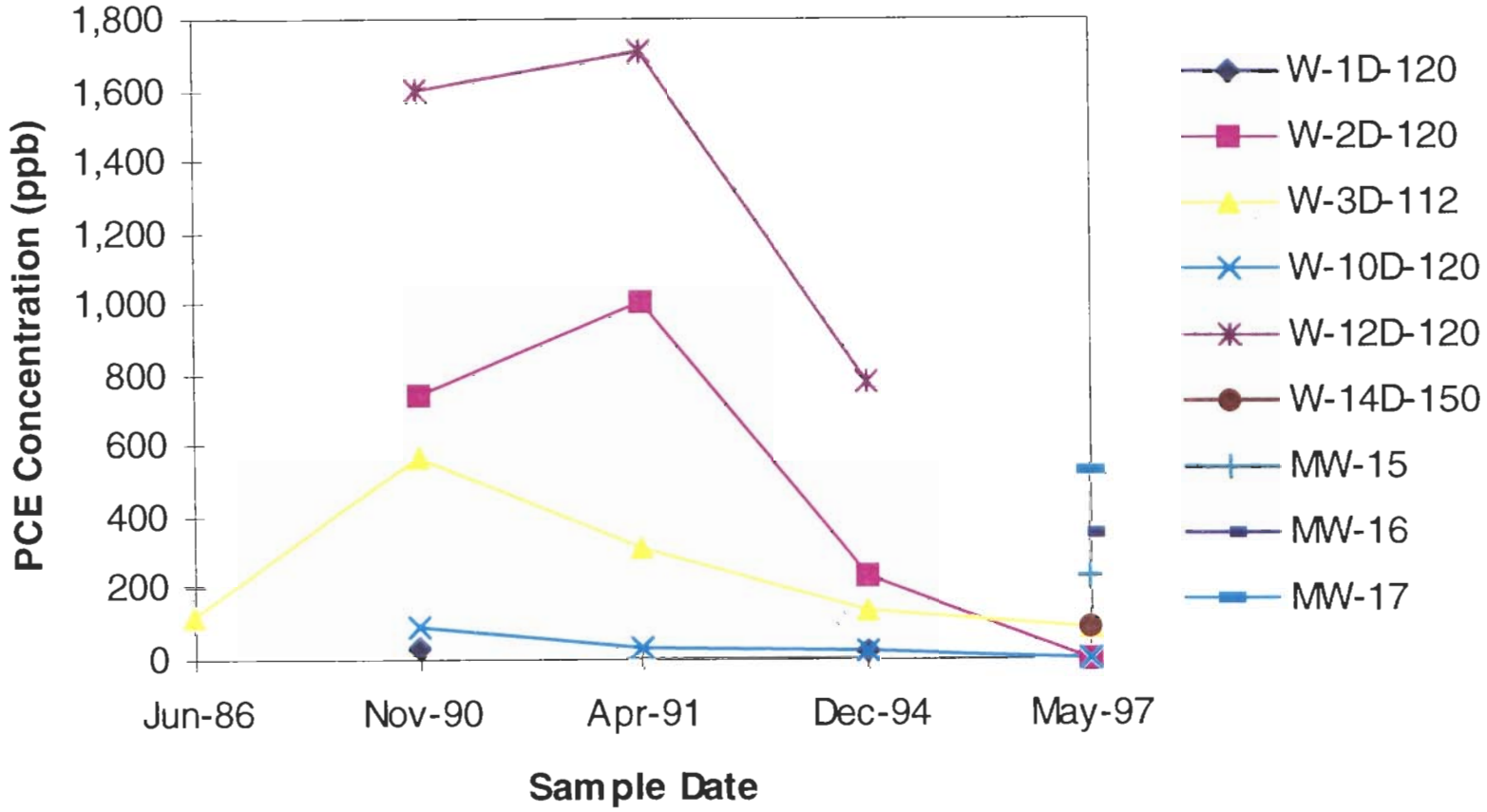
FIGURE 1- 27
Tetrachloroethene (PCE) Concentrations in Groundwater from Shallow Wells



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DATE: 7/97 JOB No.: 41623ZA

REMEDIAL INVESTIGATION / FEASIBILITY STUDY
HICKSVILLE, NEW YORK

FIGURE 1- 28
Tetrachloroethene (PCE) Concentrations in Groundwater from Deep Wells

AIR TECHNIQUES

TCE*	13–74 ppb
PCE*	64–4,200 ppb
CIS – 1, 2–DCE*	10–29 ppb
DOWNGRADIENT LIMIT:	UNKNOWN
DOWNGRADIENT WELL:	368–770 ppb* TOTAL VOCs

UPGRADIENT SOURCE SUSPECTED
* NOV. 1995 – SEPT. 1996 DATA

GENERAL INSTRUMENT

TCE*	6–430 ppb
PCE*	18–530 ppb
CIS – 1, 2–DCE*	6–840 ppb
DOWNGRADIENT LIMIT:	UNKNOWN
DOWNGRADIENT WELL:	1,360 ppb* TOTAL VOCs

UPGRADIENT SOURCE SUSPECTED
* MAY. 1997 DATA

NEW CASSEL

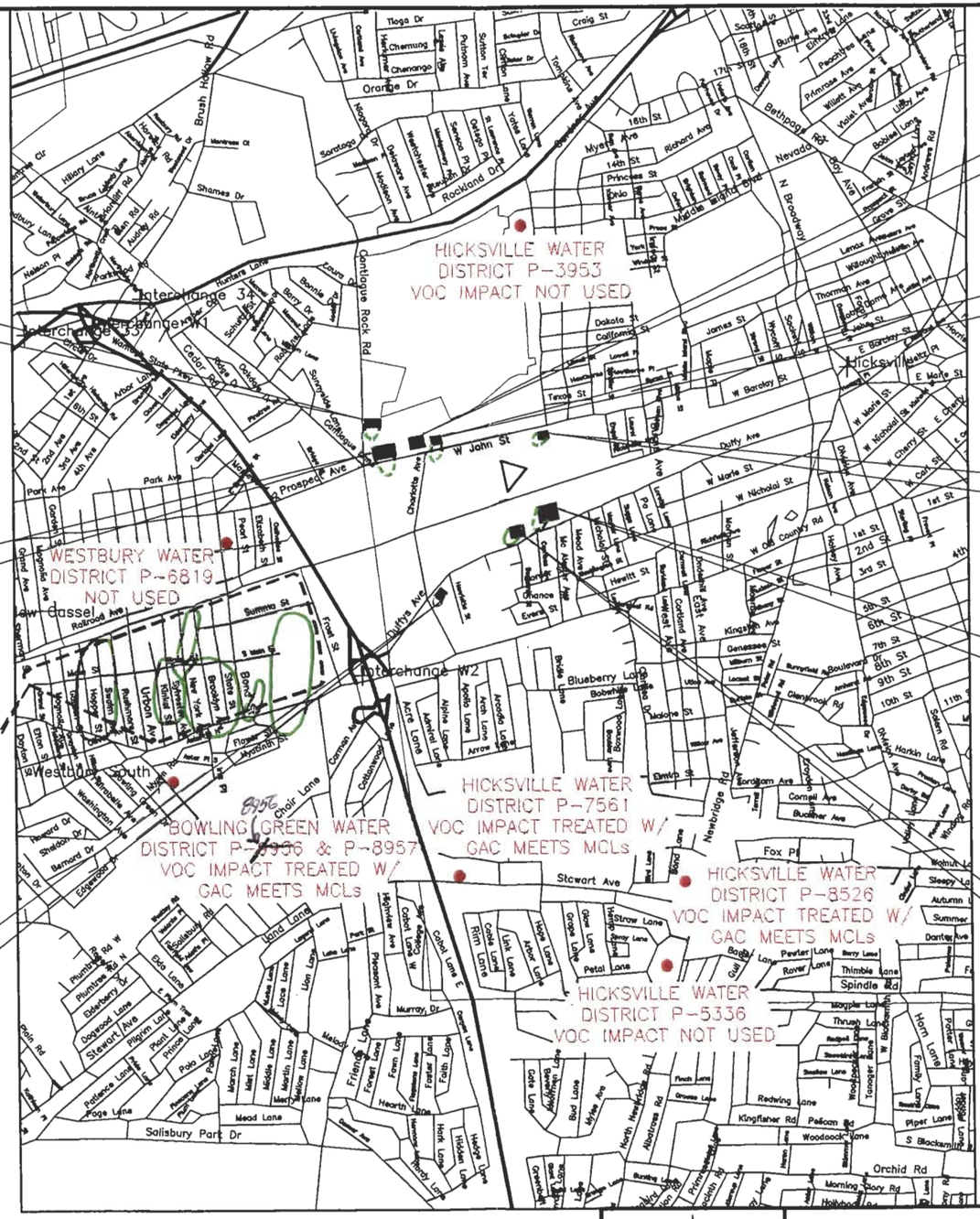
TCE*	1.7–4,200 ppb
PCE*	1.5–3,700 ppb
CIS – 1, 2–DCE*	5.4–1,400 ppb
1, 1–DCE*	3.5–880 ppb
1, 1–DCA*	4–440 ppb
1, 1, 1–TCA*	4.3–3,900 ppb
DOWNGRADIENT LIMIT:	UNKNOWN
DOWNGRADIENT WELL:	415.7 ppb* TOTAL VOCs

UPGRADIENT SOURCE SUSPECTED
* OCT. 1996 DATA

DEPEW MANUFACTURING

1, 1, 1–TCA*	5 ppb
1, 1, 2, 2–PCA*	5 ppb
DOWNGRADIENT LIMIT:	UNKNOWN
DOWNGRADIENT WELL:	0

UPGRADIENT SOURCE SUSPECTED
* APRIL 1992 DATA



MATTIACE PETROCHEMICALS

MEK	
DOWNGRADIENT LIMIT:	UNKNOWN
DOWNGRADIENT WELL:	UNKNOWN

ANCHOR/LITH KEM–KO

BIS (2 – ETHYL HEXYL) PHTHALATE	
CHROMIUM	
LEAD	
DOWNGRADIENT LIMIT:	UNKNOWN
DOWNGRADIENT WELL:	UNKNOWN

AGO ASSOCIATES

1, 1–DCA	
1, 2–DCE	
DOWNGRADIENT LIMIT:	UNKNOWN
DOWNGRADIENT WELL:	UNKNOWN

ALSY MANUFACTURING

TCE*	1–4.4 ppb
PCE*	1.8–9 ppb
CIS – 1, 2–DCE*	2–5.3 ppb
1, 1, 1–TCA*	1–8.6 ppb
DOWNGRADIENT LIMIT:	UNKNOWN
DOWNGRADIENT WELL:	2.0 ppb* TOTAL VOCs

UPGRADIENT SOURCE SUSPECTED
* MAY 1997 DATA

MAGNUSONIC DEVICES

TOLUENE	6–29 ppb*
DOWNGRADIENT LIMIT:	UNKNOWN
DOWNGRADIENT WELL:	0

UPGRADIENT SOURCE SUSPECTED
* JAN. 1996 DATA

LEGEND
- EXTENT OF VOC PLUME
- LOCATION OF PUBLICWATER SUPPLY
- ESTIMATED EXTENT OF PLUME

-N-

SCALE: 1" = 2000'

Stearns & Wheler, LLC
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CAZENOVIA, NEW YORK

DATE: 7/97 JOB No.: 41623ZA

GENERAL INSTRUMENT CORPORATION
600 WEST JOHN STREET
HICKSVILLE, NEW YORK

FIGURE 2–1
REGIONAL GROUNDWATER QUALITY

TABLES

TABLE 1-1
GAS CHROMATOGRAPH RESULTS
GENERAL INSTRUMENT
HICKSVILLE, NY
APRIL-MAY 1997

Well	Date	Depth (ft)	Analytes	Field Conc. (ppb)	Lab Conc. (ppb)	No. Unk. Peaks	Screened Interval (ft BGS)
W-15-170	4/24/97	64-68	TCE	0.612		5	
			PCE	24.2			
			C-T 1,2-DCE	4.957			
	4/28/97	84-88	TCE	*		1	
			PCE	*			
		104-108	C-T 1,2-DCE	*		2	
			TCE	5.292			
		124-128	NO SAMPLE RECOVERED				
		144-148	C-T 1,2-DCE	*		6	
			TCE	7.713			
			PCE	*			
			XYLENE	3.51			
		164-168	C-T 1,2-DCE	2.243	6	2	160-170
			TCE	42.61	36		
			PCE	*	230		
	4/29/97	184-188	C-T 1,2-DCE	0.152		3	
			TCE	0.706			
			PCE	4.001			
			XYLENE	0.275			
		204-208	C-T 1,2-DCE	0.04		5	
			TCE	1.925			
			PCE	2.198			
W-16-148	4/30/97	80-84	C-T 1,2-DCE	0.174		5	
			TCE	0.727			
		100-104	C-T 1,2-DCE	0.059		4	
			TCE	0.061			
		120-124	C-T 1,2-DCE	0.118		4	
			TCE	0.026			
			PCE	0.339			
		140-144	C-T 1,2-DCE	**	580	3	138-148
			TCE	132	430		
			PCE	654	350		
		160-164	C-T 1,2-DCE	0.023		3	
			TCE	3.413			
			PCE	12.76			
		180-184	TCE	0.435		3	
			PCE	2.367			
W-17-130	5/2/97	60-64	C-T 1,2-DCE	0.16		3	
			PCE	0.034			
		80-84	C-T 1,2-DCE	0.095		4	
			PCE	0.665			
		100-104	C-T 1,2-DCE	0.002		4	
			PCE	0.71			
		120-124	C-T 1,2-DCE	**	483	4	120-130
			TCE	1.146	14		
			PCE	282.8	530		
		140-144	C-T 1,2-DCE	0.227		3	
			TCE	4.974			
			PCE	138.8			
		160-164	TCE	1.513		5	
			PCE	68.28			
		180-184	TCE	0.122		4	
			PCE	3.977			
		200-204	C-T 1,2-DCE	0.165		2	
			TCE	0.158			
			PCE	1.931			

*GC results in mvs not ppb, concentration not available.

**Large TCE/PCE peaks at low gain eliminated Cis/Trans DCE peaks

Table 1-2
Groundwater Sampling Results
Volatile Organic Compounds
General Instrument
Hicksville, New York
May-97

		Samping Locations																			
Compound (ug/l)	**Standards (ug/l)**	**W-10-71**		**W-3-72**		**W-2-71**		**W-1-75**		**W-10D-120**		**W-5-78**		**W-11-70**	
Chloromethane	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Bromomethane	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Vinyl Chloride	2	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Chloroethane	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Methylene Chloride	5	10	U	10	U	10	U	73	JB	2	JB	10	U	10	U
Acetone	50G	10	U	10	U	10	U	130	JB	10	U	10	U	10	U
Carbon Disulfide	50	10	U	10	U	10	U	200	U	10	U	10	U	10	U
1,1-Dichloroethene	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
1,1-Dichloroethane	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
1,2-Dichloroethene (total)	5	10	U	**6**	**J**	10	U	**840**		4	J	10	U	10	U
Chloroform	7	10	U	10	U	10	U	200	U	10	U	10	U	10	U
1,2-Dichloroethane	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
2-Butanone	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
1,1,1-Trichloroethane	5	10	U	10	U	10	U	200	U	10	U	3	J	10	U
Carbon Tetrachloride	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Bromodichloromethane	50G	10	U	10	U	10	U	200	U	10	U	10	U	10	U
1,2-Dichloropropane	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
cis-1,3-Dichloropropene	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Trichloroethene	5	**200**		**6**	**J**	**62**		**1900**		**9**	**J**	**23**		**14**	
Dibromochloromethane	50G	10	U	10	U	10	U	200	U	10	U	10	U	10	U
1,1,2-Trichloroethane	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Benzene	0.7	10	U	10	U	10	U	200	U	10	U	10	U	10	U
trans-1,3-Dichloropropene	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Bromoform	50G	10	U	10	U	10	U	200	U	10	U	10	U	10	U
4-Methyl-2-Pentanone	50	10	U	10	U	10	U	200	U	10	U	10	U	10	U
2-Hexanone	50G	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Tetrachloroethene	5	**68**		**130**		**18**		**320**		4	J	4	J	3	J
1,1,2,2-Tetrachloroethane	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Toluene	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Chlorobenzene	5	10	U	10	U	10	U	**220**		10	U	10	U	10	U
Ethylbenzene	5	10	U	10	U	10	U	**740**		10	U	10	U	10	U
Styrene	5	10	U	10	U	10	U	200	U	10	U	10	U	10	U
Xylene (total)	5	5	J	10	U	10	U	**4700**		10	U	1	J	10	U

G: NYSDEC Guidance Value.
All values in this table are based upon NYSDEC standards as of October 1993
Shaded areas indicate exceedances of standards

		Samping Locations													
Compound (ug/l)	**Standards (ug/l)**	**W-15-170**		**W-16-148**		**W-17-130**		**W-3D-112**		**W-2D-120**		**W-1D-120**		**W-14D-150**	
Chloromethane	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
Bromomethane	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
Vinyl Chloride	2	20	U	50	U	50	U	10	U	12	J	10	U	10	U
Chloroethane	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
Methylene Chloride	5	4	JB	14	JB	14	JB	10	U	5	J	10	U	10	U
Acetone	50G	17	JB	31	JB	32	JB	10	U	11	JB	5	J	10	U
Carbon Disulfide	50	20	U	50	U	50	U	10	U	20	U	10	U	10	U
1,1-Dichloroethene	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
1,1-Dichloroethane	5	20	U	50	U	50	U	10	U	2	J	10	U	2	J
1,2-Dichloroethene (total)	5*	**6**	**J**	**580**		**48**	**J**	10	U	**220**		2	J	4	J
Chloroform	7	20	U	50	U	50	U	10	U	20	U	10	U	10	U
1,2-Dichloroethane	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
2-Butanone	50G	20	U	50	U	50	U	10	U	20	U	10	U	10	U
1,1,1-Trichloroethane	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
Carbon Tetrachloride	5	20	U	50	U	50	U	2	J	20	U	10	U	10	U
Bromodichloromethane	50G	20	U	50	U	50	U	10	U	20	U	10	U	10	U
1,2-Dichloropropane	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
cis-1,3-Dichloropropene	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
Trichloroethene	5	**36**		**430**		**14**	**J**	**20**		**34**		1	J	**59**	
Dibromochloromethane	50G	20	U	50	U	50	U	10	U	20	U	10	U	10	U
1,1,2-Trichloroethane	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
Benzene	0.7	20	U	50	U	50	U	10	U	20	U	10	U	10	U
trans-1,3-Dichloropropene	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
Bromoform	50G	20	U	50	U	50	U	10	U	20	U	10	U	10	U
4-Methyl-2-Pentanone	50	20	U	50	U	50	U	10	U	20	U	10	U	10	U
2-Hexanone	50G	20	U	50	U	50	U	10	U	20	U	10	U	10	U
Tetrachloroethene	5	**230**		**350**		**530**		**92**		2	J	10	U	**84**	
1,1,2,2-Tetrachloroethane	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
Toluene	5	5	J	50	U	50	U	10	U	.4	J	10	U	10	U
Chlorobenzene	5	20	U	50	U	50	U	10	U	**70**		10	U	10	U
Ethylbenzene	5	20	U	50	U	50	U	10	U	**9**	**J**	10	U	10	U
Styrene	5	20	U	50	U	50	U	10	U	20	U	10	U	10	U
Xylene (total)	5*	20	U	50	U	50	U	10	U	**16**	**J**	10	U	**6**	**J**

G: NYSDEC Guidance Value.
All values in this table are based upon NYSDEC standards as of October 1993
Shaded areas indicate exceedances of standards
* Applies to each isomer separately

TABLE 1-3
GENERAL INSTRUMENT
GROUNDWATER ANALYTICAL RESULTS
Jun-86
GENERAL INSTRUMENT
HICKSVILLE, NY

	GW Std.	Sample Location					
Analyte (ug/l)	**(ug/l)**	**W-1-75**	**W-2-120**	**W-3-72**	**W-3-112**	**W-5-78**	**W-6-79**
Trichloroethene	5	**13,000**	1.5	**47.6**	**12.6**	2.9	**263**
Tetrachloroethene	5	**1030**		**491**	**117**	**11.3**	**45.4**
1,2-Dichlorobenzene	4.7	**28000**					**84.9**
1,1,1-Trichloroethane	5	**153**	3.7	1.1	3.1		**58.2**
Toluene	5	**18.7**			4.8		**6.3**
Ethylbenzene	5	**1100**					**61.3**
Chloroform	7	**24.7**					
Methylene Chloride	5	**6.4**					
Trans-1,2-Dichloroethene	5	**504**		**17.1**			**797**
Vinyl Chloride	2						**228**
	5		3.1				
1,1-Dichloroethane	5	**9.7**		1.8	1		**10.2**
1,2-Dichloroethane	5	1.4					

TABLE 1-4
GENERAL INSTRUMENT
GROUNDWATER ANALYTICAL RESULTS
Jul-87
GENERAL INSTRUMENT
HICKSVILLE, NY

	GW Std.	Sample Location					
Analyte (ug/l)	**(ug/l)**	**W-1-75***	**W-2-120**	**W-3-72**	**W-3-112**	**W-5-78**	**W-6-79**
Phenols	1		0.013	0.006	0.002	0.042	0.008
Trichloroethene	5		4.22	**306**	**10.5**	**9.78**	1.71
1,2-Dichlorobenzene	4.7						2.94
1,3-Dichlorobenzene	5						0.37
1,4-Dichlorobenzene	4.7						0.49
1,1-Dichloroethane	5			2.35	1.86	0.33	0.34
1,1-Dichloroethene	5			0.56			
1,2-Dichloroethene (total)	5		2.38	**87.91**	3.45	**6.98**	**7.25**
1,1,1-Trichloroethane	5		0.51	**6.15**	3.7	4.28	
1,1,2-Trichloroethane	5		2.57	2.11	**308**	**9.21**	0.47
	0.7						**1.38**
Toluene	5		0.23		0.56	0.2	0.38
Ethylbenzene	5						2.27
Xylene	5		0.34				2.2
	2						**10.3**
	5						0.22

*Not sampled due to dedicated pump failure

Table 1-5
Groundwater Sampling Results
Volatile Organic Compounds
General Instrument
Hicksville, New York
Nov-90

		Sampling Locations															
Compound (ug/l)	Standards	W-1-75	W-1D-120	W-2-71	W-2D-120	W-3-72	W-3D-112	W-5-78	W-6-79	W-7-71	W-8-71	W-9-71	W-10-71	W-10D-120	W-11-70	W-12-70	W-12D-120
Chloromethane	5																
Bromomethane	5																
Vinyl Chloride	2																
Chloroethane	5														UJ		
Methylene Chloride	5		25 U		500 U	50 U	25 U	25 U					50 U		5 U		54 U
Acetone	50G	400 U	130 U	460 U	1400 U	100 U	50 U	50 U		13 U	UJ		130 U	10 U	23 U	10 U	180 U
Carbon Disulfide	50									1 J							
1,1-Dichloroethene	5							13 J						12			
1,1-Dichloroethane	5		13 J														
trans-1,2-Dichloroethene	5	2300 U	**790**	100 U	500 U	57 U		37 U						6 U			
Chloroform	7																
1,2-Dichloroethane	5																
2-Butanone	5	R	R	R	1100 J	R	R	R	R	R	R	R	R	R	T	R	R
1,1,1-Trichloroethane	5			**2500**				**310**	2 J	4 J				**33**			
Carbon Tetrachloride	5																
Vinyl Acetate		UJ	UJ	UJ	UJ			UJ						UJ			
Bromodichloromethane	50G																
1,2-Dichloropropane	5	UJ	UJ	UJ	UJ			UJ						UJ			
trans-1,3-Dichloropropene	5																
Trichloroethene	5	**43000**	**260**	**2800**	**5300**	**97**	**26**	**150**	**8**			**22000**	**1400**	**26**	**55**		93 J
Dibromochloromethane	50G																
1,1,2-Trichloroethane	5																
Benzene	0 7																
cis-1,3-Dichloropropene	5																
2-Chloroethylvinylether																	
Bromoform	50G																
4-Methyl-2-Pentanone	50	UJ	UJ	UJ	UJ			UJ				UJ	UJ	UJ	UJ		
2-Hexanone	50G	UJ	UJ	UJ	UJ			UJ				UJ	UJ	UJ	UJ		UJ
Tetrachloroethene	5	**4800**	**29**	**620**	**740**	**1400**	**560**	**27**		**140**	**46**	**240**	**470**	**89**	**14**	2 J	**1600**
1,1,2,2-Tetrachloroethane	5																
Toluene	5																
Chlorobenzene	5																
Ethylbenzene	5	**8100**															
Styrene	5																
Xylene (total)	5	**28000**	**49**	100 U				25 U					**210**				7 J

U = Not detected substantially above the level reported in labratory or field blanks.
R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
J = Analyte present. Reported value may not be accurate or precise.
UJ = The reported quantitation limits are qualified estimated.

TABLE 1-6
GENERAL INSTRUMENT
GROUNDWATER ANALYTICAL RESULTS
4/30/91
GENERAL INSTRUMENT
HICKSVILLE, NY

	GW Std.	Sample Location														
Analyte (ug/l)	**(ug/l)**	**W-7**	**W-8**	**W-3D**	**W-3**	**W-6**	**W-11**	**W-5**	**W-12D**	**W-10D**	**W-10**	**W-12**	**W-2**	**W-9**	**W-2D**	**W-1D**	**W-1**
1,1-Dichloroethene	5	U	**9**	U	U	U	U	**16**	U	**4J**	U	U	U	U	U	U	U
1,2-Dichloroethene (total)	5	U	U	U	**38**	U	U	**31**	U	**7**	U	U	U	U	**4100**	**1000**	**3300**
1,1,1-Trichloroethane	5	**4J**	U	U	U	U	U	**360**	U	**10**	U	U	**73**	U	U	U	U
Carbon Tetrachloride	5	U	U	U	U	U	U	**61**	U	U	U	U	U	U	U	U	U
Trichloroethene	5	U	U	**19**	**62**	U	**1900**	**180**	U	**34**	**700**	U	**1400**	**24000**	**12000**	**210**	**48000**
1,1,2-Trichloroethane	5	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tetrachloroethene	5	**130**	**54**	**310**	**690**	U	**380**	**22**	**1700**	**34**	**240**	U	**250**	**1900**	**1000**	U	**4000**
Toluene	5	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Ethylbenzene	5	U	U	U	U	U	U	U	U	U	U	U	U	U	U	**23J**	**8000**
Xylene	5	U	U	U	U	U	U	U	U	U	**210**	U	U	U	**370J**	**140**	**30000**

TABLE 1-7
GENERAL INSTRUMENT
GROUNDWATER ANALYTICAL RESULTS
12/15/94
GENERAL INSTRUMENT
HICKSVILLE, NY

	GW Std.	Sample Location																
Analyte (ug/l)	(ug/l)	W-1D-120	W-1-75	W-11-70	W-12-70	W-5-78	W-6-79	W-9-71	W-10-70	W-10D-120	W-12D-120	W-2-71	W-2D-120	W-3-72	W-3D-112	W-7-71	W-14	W-8-71
Vinyl chloride	2	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	**130**	UJ	UJ	UJ	UJ	UJ
1,1-Dichloroethene	5	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	**16**	UJ	4J	**26**	UJ	UJ	UJ	2J	UJ
1,1-Dichloroethane	5	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	**8J**	UJ	**2J**	UJ	UJ	UJ
1,2-Dichloroethene (total)	5	**490**	**250J**	UJ	UJ	**3J**	UJ	**2J**	**4J**	1J	**11J**	**130**	**710**	**7J**	2J	UJ	UJ	1J
1,1,1-Trichloroethane	5	UJ	**79J**	UJ	UJ	**12J**	UJ	UJ	**4J**	**360**	UJ	**40**	**16**	U	**73**	2J	UJ	UJ
Carbon Tetrachloride	5	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	**61**	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Trichloroethene	5	**69**	**14000J**	**13J**	UJ	**86**	UJ	**69**	**1700J**	**10J**	3J	**2700**	**2800**	**12**	**12**	UJ	**15**	**2J**
1,1,2-Trichloroethane	5	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Benzene	0.7	UJ	UJ	UJ	UJ	UJ	UJ	UJ	1J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Tetrachloroethene	5	**20**	**1800J**	2J	**UJ**	**14J**	U	**80**	**180J**	**19J**	**780J**	**250**	**230**	**140**	**140**	**69J**	**27**	**41**
	5	UJ	**54J**	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	U	UJ	UJ	UJ	UJ	UJ
Ethylbenzene	5	UJ	**6900J**	UJ	UJ	UJ	UJ	1J	UJ	UJ	UJ	UJ	5J	UJ	UJ	UJ	**18**	UJ
Xylene	5	UJ	**25000J**	UJ	UJ	UJ	UJ	3J	UJ	UJ	UJ	UJ	**210**	UJ	UJ	UJ	**98**	**370J**
Freon 113		UJ	UJ	UJ	UJ	**4J**	UJ	UJ	UJ	UJ	UJ	UJ	27	UJ	UJ	UJ	UJ	UJ

Table 2-1
ROUND 1
GROUNDWATER ANALYTICAL RESULTS
Air Techniques
Cantiague Rock Road
Hicksville, N.Y.
Nov-95

	Sample Location					NYSDEC
Analyte (ug/l)	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**Std. (ug/l)**
cis-1,2-Dichloroethene			18J	10J		5
Tetrachloroethene	110	480	350	380	2300J	5
Trichloroethene	41	34J		20J		5

Groundwater standard based on NYSDEC TOGS 1.1.1 (October 1993)

ROUND 2
GROUNDWATER ANALYTICAL RESULTS
Air Techniques
Cantiague Rock Road
Hicksville, N.Y.
Feb-96

	Sample Location					NYSDEC
Analyte (ug/l)	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**Std. (ug/l)**
cis-1,2-Dichloroethene						5
Tetrachloroethene	200	740	770	480	4200	5
Trichloroethene	74	53		28		5

Groundwater standard based on NYSDEC TOGS 1.1.1 (October 1993)

ROUND 3
GROUNDWATER ANALYTICAL RESULTS
Air Techniques
Cantiague Rock Road
Hicksville, N.Y.
May-96

	Sample Location					NYSDEC
Analyte (ug/l)	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**Std. (ug/l)**
cis-1,2-Dichloroethene						5
Tetrachloroethene	64	590	590	270	3400	5
Trichloroethene	16	30J	31J	13J	28J	5

Groundwater standard based on NYSDEC TOGS 1.1.1 (October 1993)

ROUND 4
GROUNDWATER ANALYTICAL RESULTS
Air Techniques
Cantiague Rock Road
Hicksville, N.Y.
Sep-96

	Sample Location					NYSDEC
Analyte (ug/l)	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**Std. (ug/l)**
cis-1,2-Dichloroethene			29			5
Tetrachloroethene	110	710	400	290	2400	5
Trichloroethene	26	42	24J	13J		5

Groundwater standard based on NYSDEC TOGS 1.1.1 (October 1993)

Table 2-2
GROUNDWATER ANALYTICAL RESULTS
Alsy Manufacturing Site
Duffys Ave.
Hicksville, N.Y.
May-97

	Sample Location															NYSDEC
Analyte (ug/l)	**GP-5GW**	**GP-7GW**	**GP-8GW**	**GP-9GW**	**GP-12GW**	**GP-13GW**	**PGW-3**	**PGW-4**	**PGW-5**	**PGW-6**	**PGW-8**	**LMS-1**	**LMS-2**	**LMS-3**	**MW-3**	**Std. (ug/l)**
1,1,1-Trichloroethane		8.6	6		2.9	1	1.2		12		2	2	4		2	5
Tetrachloroethene	2.2		2		1.8	2	2			8.4		5		9		5
Trichloroethene		1.8	1					4.4			1.1					5
1,2-Dichloroethene		5.3	2													5
Trichlorethane				1.8												5

GP: Shallow groundwater probes
PGW: Perimeter probes
MW: Monitoring well
Groundwater standard based on NYSDEC TOGS 1.1.1 (October 1993)

Table 2-3
GROUNDWATER ANALYTICAL RESULTS
Magnusonic Devices, Inc.
Duffys Ave.
Hicksville, N.Y.
May-97

	Sample Location				NYSDEC
Analyte (ug/l)	**MW-5**	**MW-7**	**MW-8**	**MW-10**	**Std. (ug/l)**
Toluene	29	6J	10	9J	5

Groundwater standard based on NYSDEC TOGS 1.1.1 (October 1993)

Table 2-4
GROUNDWATER ANALYTICAL RESULTS
Depew Manufacturing Corp.
Hicksville, N.Y.
Feb-93

	Sample Location	NYSDEC
Analyte (ug/l)	**DMMW-1**	**Std. (ug/l)**
1,1,1-Trichloroethane	5	5
1,1,2,2-Trichlorethane	5	5

Groundwater standard based on NYSDEC TOGS 1.1.1
(October 1993)

Table 2-5
GROUNDWATER ANALYTICAL RESULTS
New Cassel Industrial Area
North Hempstead, N.Y.
Feb-97

	Sample Location				NYSDEC
Analyte (ug/l)	**LFR-1**	**LFR-2**	**LFR-3**	**LFR-4**	**Std. (ug/l)**
1,1-Dichloroethene	6.7				5
1,1-Dichloroethane	7.3				5
trans-1,2-Dichloroethene				2.5	5
Chloroform			1.3		5
cis-1,2-Dichloroethene			54	351	5
1,1,1-Trichloroethane	134	6.6	3.4	3.1	5
Trichloroethene	123	44	166	563	5
Tetrachloroethane	244	9720	51780	6010	5
1,2-Dichlorobenzene			3.3		5

Groundwater standard based on NYSDEC TOGS 1.1.1 (October 1993)

Table 2-6
GEOPROBE GROUNDWATER DATA SUMMARY
Water Table To 65 Ft Range
New Cassel Industrial Area Task 4 Multisite PSA
Oct-96

	Analyte (ug/l)					
Sample ID	**1,1-DCE**	**1,1-DCA**	**cis 1,2-DCE**	**1,1,1-TCA**	**TCE**	**PCE**
NYSDEC Std.	**5**	**5**	**5**	**5**	**5**	**5**
GP-189			30		38	400
GP-190						14000
GP-191			170		160	
GP-192			210		110	67
GP-193			310		11	
GP-194			1700		490	
GP-195			250			
GP-196						7.5
GP-197						160
GP-202				15	27	200
GP-203			40			
GP-204						
GP-205				45		28
GP-206	51	28		140	42	20
GP-207	3.5	4		12	6.3	2.1
GP-208	11		5.4	43		13
GP-209						
GP-210	67	40	24	460	49	55
GP-211				4.3		
GP-212						180
GP-219						
GP-220						
GP-221	17			53		
GP-222	110			420	170	
GP-223						
GP-224			14	89	54	25
GP-225						970
GP-226						1600
GP-228				11	23	77
GP-229					5.9	7.5
GP-230			260		170	34
GP-231						
GP-232						37
GP-233						1100
GP-234	9			110	6.8	
GP-235						
GP-237						340
GP-238			1000		330	
GP-241						9.5
GP-242			8.7		13	64
GP-243			91		61	48
GP-244				12	5.3	
GP-248	510			3900	1800	
GP-251				2.9		1.5
GP-252					17	200
GP-253						10
GP-255						21

Groundwater standard based on NYSDEC TOGS 1.1.1 (October 1993)

Table 2-7
GEOPROBE GROUNDWATER DATA SUMMARY
Water Table To 85 Ft Range
New Cassel Industrial Area Task 4 Multisite PSA
Oct-96

	Analyte (ug/l)					
Sample ID	**1,1-DCE**	**1,1-DCA**	**cis 1,2-DCE**	**1,1,1-TCA**	**TCE**	**PCE**
NYSDEC Std.	**5**	**5**	**5**	**5**	**5**	**5**
GP-189			1900		1500	11000
GP-190					2400	37000
GP-191						340
GP-192					520	3800
GP-193			87		6.1	54
GP-194					34	390
GP-195					1.7	12
GP-196						6
GP-197						1.3
GP-202			8.3	21	27	28
GP-203	9.7			39		
GP-204						
GP-206	170	130		830		
GP-209				5.6		5.9
GP-210	41	15	12	150	37	61
GP-211						
GP-212						3300
GP-219						
GP-220						
GP-221				290		
GP-222	650	440		2300	120	
GP-223						12
GP-224	6.8			58	12	15
GP-225						
GP-226						
GP-228						5.1
GP-229				6	35	77
GP-230					110	1100
GP-231						2.9
GP-232						70
GP-233						5.3
GP-234						
GP-235				14		
GP-237				110		
GP-238			560		250	250
GP-241						
GP-242						330
GP-243					61	950
GP-244						
GP-248	880			2500	9200	
GP-251				7.3		2.2
GP-252						1300
GP-253						
GP-255	43	39	21	130	51	91

Groundwater standard based on NYSDEC TOGS 1.1.1 (October 1993)

Table 2-8
GEOPROBE GROUNDWATER DATA SUMMARY
Water Table To 85+ Ft Range
New Cassel Industrial Area Task 4 Multisite PSA
Oct-96

	Analyte (ug/l)					
Sample ID	**1,1-DCE**	**1,1-DCA**	**cis 1,2-DCE**	**1,1,1-TCA**	**TCE**	**PCE**
NYSDEC Std.	**5**	**5**	**5**	**5**	**5**	**5**
GP-189					5400	82000
GP-190				950		6800
GP-191					1.2	12
GP-192					29	110
GP-193					16	82
GP-194						4.3
GP-195						
GP-196			1.2		5.6	
GP-197						
GP-202				1.7	5.4	1.7
GP-203				6.1		
GP-204						
GP-205	190	16		390	110	210
GP-206	120	100		610		
GP-207	140	91	18	390	99	27
GP-208	21	5.3		55	6	
GP-209	6.7	12	5	42	29	57
GP-210	110	31	14	280	96	120
GP-211						
GP-212						4600
GP-219						
GP-220						
GP-221	180			450		
GP-222				180	470	
GP-223						
GP-224						
GP-225						1.3
GP-226					2.4	1.4
GP-228						
GP-229						
GP-230					13	36
GP-231						
GP-232						66
GP-234						
GP-235	9.1			66		
GP-237						
GP-238					370	1300
GP-241					5.5	
GP-242						2400
GP-243						1.3
GP-244						
GP-248	46	47		130	80	32
GP-251						1.4
GP-252	1.3	5.9		2.1		
GP-253						
GP-255						

Groundwater standard based on NYSDEC TOGS 1.1.1 (October 1993)

Table 3-1
Hicksville Water District
Well N-03953

	Analyte (ug/l)	
Date	1,1,1-Trichloroethane	Tetrachloroethene
GW Std.	5.00	5.00
12/29/92	1.90	0.60
9/17/93	0.80	
12/10/93	1.20	0.50
3/14/94	1.00	
9/27/94	0.70	
12/9/94	0.60	
6/27/95	0.60	
9/26/95	0.60	

Table 3-1
Hicksville Water District
Well N-07561

	Analyte (ug/l)				
Date	1,1,1-Trichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	Tetrachloroethene	Trichloroethene
GW Std.	5.00	5.00	5.00	5.00	2.00
5/6/92					12.00
5/28/92				1.80	13.00
6/30/92				2.60	14.00
7/22/92					
8/27/92				2.60	17.00
9/23/92				2.30	15.00
12/23/92				0.60	
3/31/93				1.10	24.00
4/27/93				0.60	17.00
5/12/93				0.60	14.00
5/12/93					0.90
5/12/93					0.60
6/29/93					15.00
8/27/93				1.80	18.00
9/21/93	0.50			2.00	16.00
9/24/93	0.50			2.40	19.00
10/26/93	0.60			2.30	19.00
11/23/93	0.70			2.80	23.00
12/10/93				0.80	9.10
3/9/94	0.50			2.00	46.00
6/27/94				1.00	22.00
6/30/95				0.70	21.00
7/27/95		1.00		1.00	18.00
9/27/95	0.50			1.90	23.00
10/31/95	0.50			2.70	33.00
11/30/95	0.50			2.80	35.00
12/27/95				2.10	31.00
1/31/96				2.00	29.00
2/28/96				2.00	34.00
3/27/96				2.10	34.00
4/29/96				2.00	27.00
5/29/96				1.80	33.00
6/27/96				2.40	41.00
7/30/96				2.80	43.00
8/29/96				2.70	52.00
9/26/96	0.70			4.10	47.00
10/30/96	0.60		0.50	33.90	60.00
11/25/96	0.70		0.60	4.60	65.00
12/18/96				2.90	32.00

Table 3-1
Hicksville Water District
Well N-08526

	Analyte (ug/l)					
Date	1,1,1-Trichloro-	1,1-Dichloro-	1,1-Dichloro-	Cis-1,2-Dichloro-	Tetrachloro-	Trichloro-
	ethane	ethane	ethene	ethene	ethene	ethene
GW Std.	5.00	5.00	5.00	5.00	5.00	2.00
6/26/92				0.70		
7/2/93						1.00
7/2/93						0.70
8/27/93	12.00	0.50	4.90	2.80	5.40	18.00
9/16/93	10.00	0.60	5.20	3.90	4.70	22.00
9/24/93	12.00	0.60	5.70	4.50	5.50	24.00
10/26/93	12.00	0.60	5.00	4.30	5.60	26.00
11/30/93	21.00	0.90	10.00	6.40	8.70	38.00
3/14/94						1.00
6/24/94	21.00	0.90	11.00	4.40	8.10	24.00
7/29/94	16.00		5.30	3.70	5.60	28.00
8/30/94	29.00	1.50	16.00	6.80	11.00	34.00
9/27/94	1.20			0.90	0.70	6.20
12/8/94						0.80
3/24/95						3.10
4/10/95						4.00
4/18/95				1.00		5.00
5/25/95	2.30		0.70	3.00	1.30	24.00
7/26/95	17.00	0.70	8.70	3.70	8.30	24.00
8/30/95	17.00	0.60	10.00	4.50	8.00	34.00
9/27/95	21.00	1.00	16.00	5.90	9.20	32.00
7/23/96				1.00		9.00
9/26/96	0.60			1.70		12.00
12/26/96				0.50		7.30

Table 3-2
Bowling Green Water District
Well N-08957

	Analyte (ug/l)										
Date	1,1,1-Trichloro-	1,1-Dichloro-	1,1-Dichloro-	Bromochloro-	Tetrachloro-	Trichloro-	Carbontetra-	Chloroform	Cis-1,2-Dichloro-	Tetrachloro-	Trichloro-
	ethane	ethane	ethene	methane	ethene	ethene	chloride		ethene	ethene	ethene
GW Std.	5.00	5.00	5.00	50G	5.00	2.00	5.00	7.00	5.00	5.00	2.00
3/9/92										0.50	6.00
6/11/92											0.50
9/3/92											9.00
9/8/92	0.50									0.50	8.00
5/11/93											4.00
6/9/93	1.00		0.50							1.00	8.00
9/1/93				1.00							8.00
10/13/93	1.00									0.50	13.00
3/17/94	0.50										8.00
4/5/94	1.00		0.50								10.00
5/23/94	1.00									1.00	13.00
6/8/94											4.00
6/16/94	1.00									1.00	12.00
7/25/94	1.00									1.00	14.00
8/17/94	1.00		1.00							1.50	20.00
8/24/94	0.50									1.00	13.00
9/20/94	1.00		1.00							1.00	16.00
10/24/94	1.00		1.00							1.00	18.00
11/15/94											8.00
12/6/94											7.00
12/22/94	1.00		0.50							1.00	23.00
1/20/95	5.00		3.00				1.00	1.00		4.00	23.00
2/24/95	1.00		1.00							1.00	28.00
3/24/95											9.00
3/28/95	1.00									1.00	19.00
4/27/95	1.00									1.00	22.00
5/16/95	1.00		1.00						1.00	1.00	22.00
5/22/95	1.50		1.00					0.50		1.50	26.00
6/5/95	3.00		2.00							1.00	21.00
6/12/95											8.00
6/29/95	1.00		1.00							1.00	16.00
7/20/95	1.00		1.00							1.00	16.00
8/24/95	1.00		1.00							1.00	17.00
9/15/95	1.00		0.50							1.00	20.00
9/21/95	1.00									0.50	15.00
10/26/95	0.50									0.50	15.00
10/30/95	1.00		0.50							1.00	16.00
3/7/96											4.00
3/11/96											6.00
6/20/96	0.50									2.00	12.00
7/26/96	1.00		1.00							1.00	18.00
8/8/96											
9/19/96	1.00		1.00							2.00	24.00
11/21/96											10.00
12/12/96	1.00									1.00	24.00

Table 3-2
Bowling Green Water District
Well N-08956

	Analyte (ug/l)												
Date	1,1,1-Trichloro-	1,1-Dichloro-	1,1-Dichloro-	1,2-Dichloro-	Bromochloro-	Bromodichloro-	Bromoform	Carbontetra-	Chlorodibromo-	Chloroform	Cis-1,2-Dichloro-	Tetrachloro-	Trichloro-
	ethane	ethane	ethene	ethane	methane	methane		chloride	methane		ethene	ethene	ethene
GW Std.	5.00	5.00	5.00	5.00	5.00	50G	50G	5.00	50G	7.00	5.00	5.00	2.00
3/9/92												0.50	2.00
6/11/92	2.00		2.00							0.50		2.00	13.00
8/14/92	1.00		2.00									1.00	2.00
9/3/92												1.00	2.00
12/2/92							2.00		1.00	0.50			
2/11/93										0.50			
2/16/93			0.50						0.50	0.50		0.50	10.00
5/11/93	1.00								2.00	1.00		1.00	0.50
6/9/93	1.00		0.50					0.50		0.50		1.00	3.00
9/1/93	0.50									0.50		1.00	1.00
10/13/93	2.00									1.00		4.00	1.00
3/17/94						1.00	3.00			0.50		3.00	3.00
4/5/94	3.00	0.50								2.00		3.00	2.00
6/8/94	4.00		2.00					1.00		1.00		3.00	3.00
6/16/94	3.00		2.00							1.00		3.00	7.00
7/25/94	5.00		3.00	0.50				1.00		2.00		4.50	3.00
8/17/94	5.00		3.00	0.50				2.00		2.00		6.00	5.50
8/24/94	2.00		0.50							1.00		4.00	2.00
9/20/94	5.00		3.00					2.00		2.00		4.00	6.00
10/24/94	5.00		3.00					1.50		2.00		3.50	9.00
11/15/94	4.50		3.00					1.50		1.00		3.00	9.00
12/6/94	5.00	0.50	3.00					2.00		2.00		3.00	11.00
12/22/94	6.00	0.50	3.00	0.50				2.00		2.00		6.00	6.00
1/20/95					8.00								
2/24/95	5.50	1.00	3.00	1.00				1.00		2.00		6.00	4.50
3/24/95	5.50	0.50	3.00					2.00		1.50		4.00	17.00
3/28/95	5.00		3.00					2.00		1.50		4.00	15.00
4/27/95	6.50	0.50	4.00	0.50				2.00		2.50		6.00	5.50
5/22/95	6.00	0.50	4.00	0.50				2.50		2.00		5.00	12.00
5/22/95	3.00		1.50							1.00			1.50
6/12/95	5.50		3.00	0.50				2.00		1.50		4.00	26.00
6/29/95	5.50	0.50	3.00	0.50				2.00		1.50		4.50	26.00
7/20/95	4.50		3.00					2.00		1.00		4.00	26.00
8/24/95	5.00	0.50	3.00	0.50				2.00		1.00		4.00	30.00
9/15/95		0.50	2.00					0.50		2.00		5.00	4.00
9/21/95	6.00	0.50	3.00	0.50				2.00		2.00		5.00	5.00
10/26/95	1.00		0.50				1.00		1.00	0.50		2.00	1.00
3/11/96						2.00	6.00		6.00	1.00			
3/26/96	2.00		1.00									4.00	1.00
5/17/96	5.00		5.00						3.00	2.00	2.00	2.00	21.00
6/20/96	5.00	1.00	3.00	0.50					2.00	2.00	2.00	4.00	26.00
7/26/96	7.00	1.00	4.00	0.50					3.00	2.00	2.00	5.00	18.00
8/28/96	6.00	0.90	5.00	0.50					3.00	2.00	2.00	3.00	21.00
9/19/96	8.00	1.00	4.00	0.50					4.00	3.00	3.00	6.00	23.00
11/21/96	6.00	1.00	3.00						2.00	2.00	2.00	4.00	26.00
12/12/96	7.00	1.00	5.00						3.00			5.00	12.00

Project Name: GEN. INST. HICKSVILLE

Job No. 41623ZA

Start
Date 4/24/97 Time

Finish
Date 4/30/97 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: W-15-170

Drilling Company: ADT-MA

Driller: T. PRESIMMONE

S&W Inspector: S&W--CEF

Drill Rig Type: CANTERRA CT-250

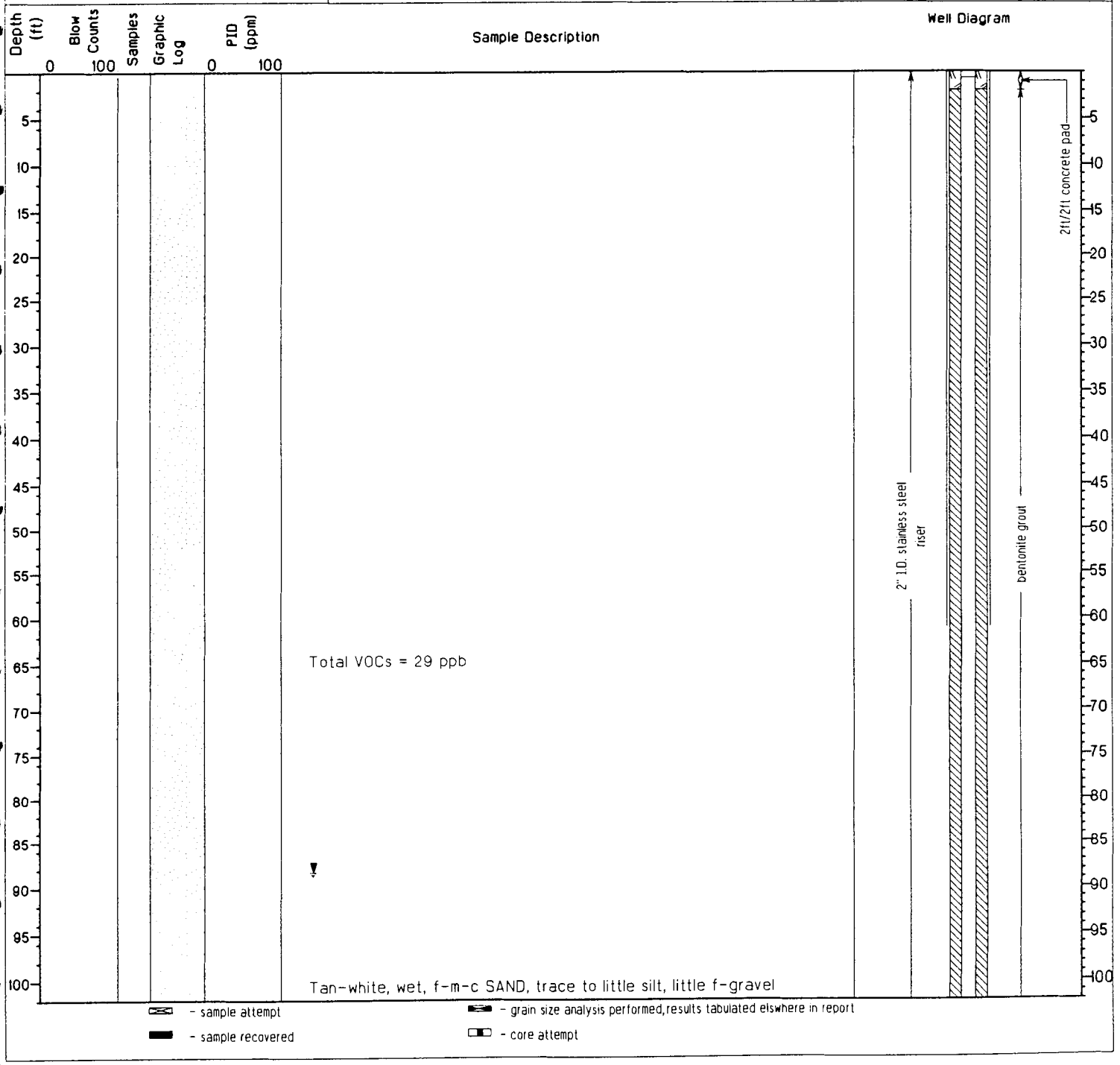
Drilling Method: MUD ROTARY

Weather: Sunny, 55 F

Elevation

X coord: feet
Y coord: feet

Groundwater Observations
Time : 0700
Date : 5/7/97
Casing Depth: 168
Boring Depth: 204
Water Depth : 87.20 (SCREEN FOULED



Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: GEN. INST. HICKSVILLE

Job No. 41623ZA

Start
Date 4/24/97 Time

Finish
Date 4/30/97 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: W-15-170

Drilling Company: ADT-MA

Driller: T. PRESIMMONE

S&W Inspector: S&W--CEF

Drill Rig Type: CANTERRA CT-250

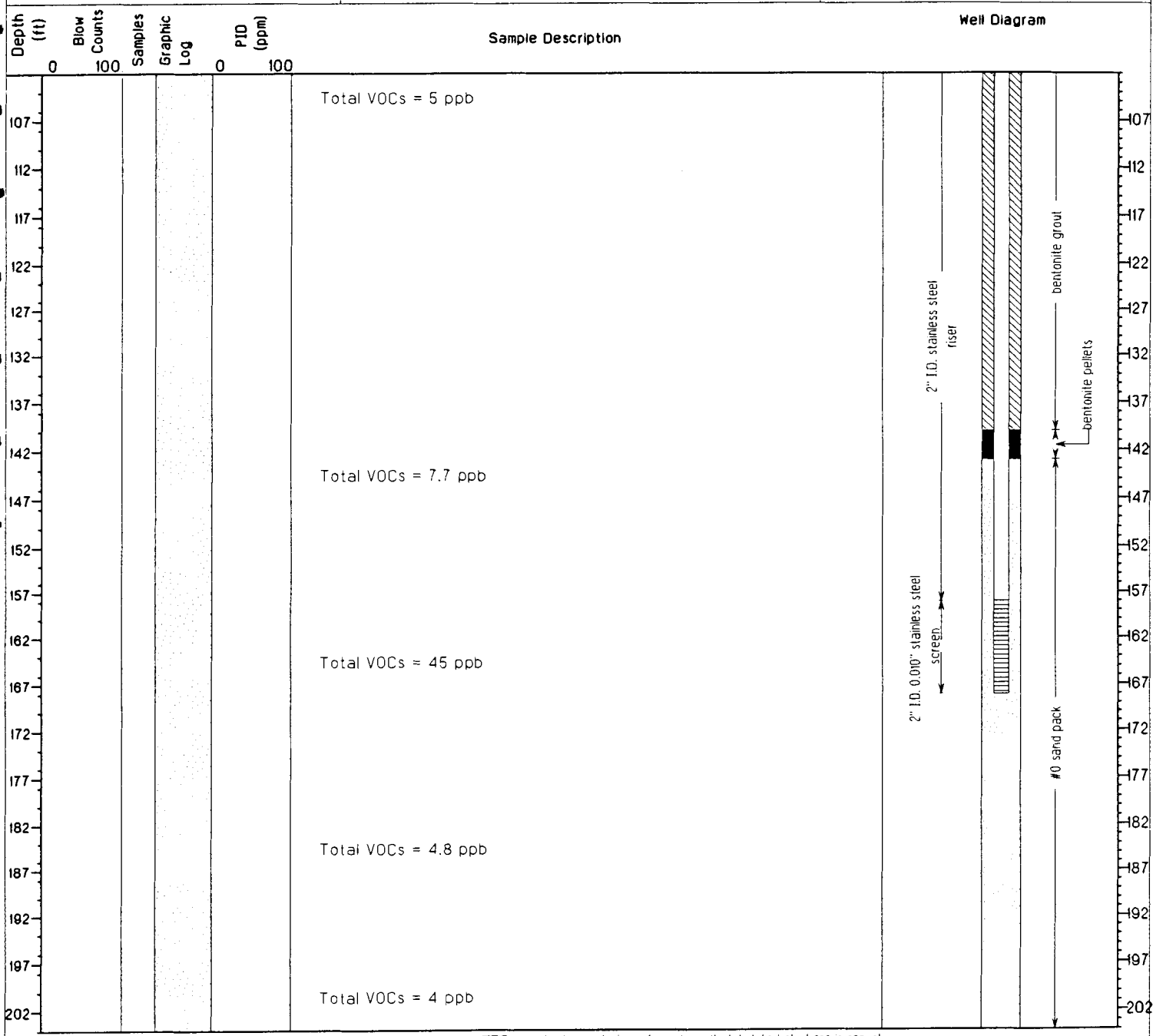
Drilling Method: MUD ROTARY

Weather: Sunny, 55 F

Elevation

X coord: feet
Y coord: feet

Groundwater Observations
Time : 0700
Date : 5/7/97
Casing Depth: 168
Boring Depth: 204
Water Depth : 87.20 (SCREEN FOULEC



- sample attempt
- sample recovered
- grain size analysis performed, results tabulated elswhere in report
- core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: GEN. INST. HICKSVILLE

Job No. 41623ZA

Start
Date 4/30/97 Time
Finish
Date 5/2/97 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: W-16-148

Drilling Company: ADT-MA

Driller: T. PRESIMMONE

S&W Inspector: S&W--CEF

Drill Rig Type: CANTERRA CT-250

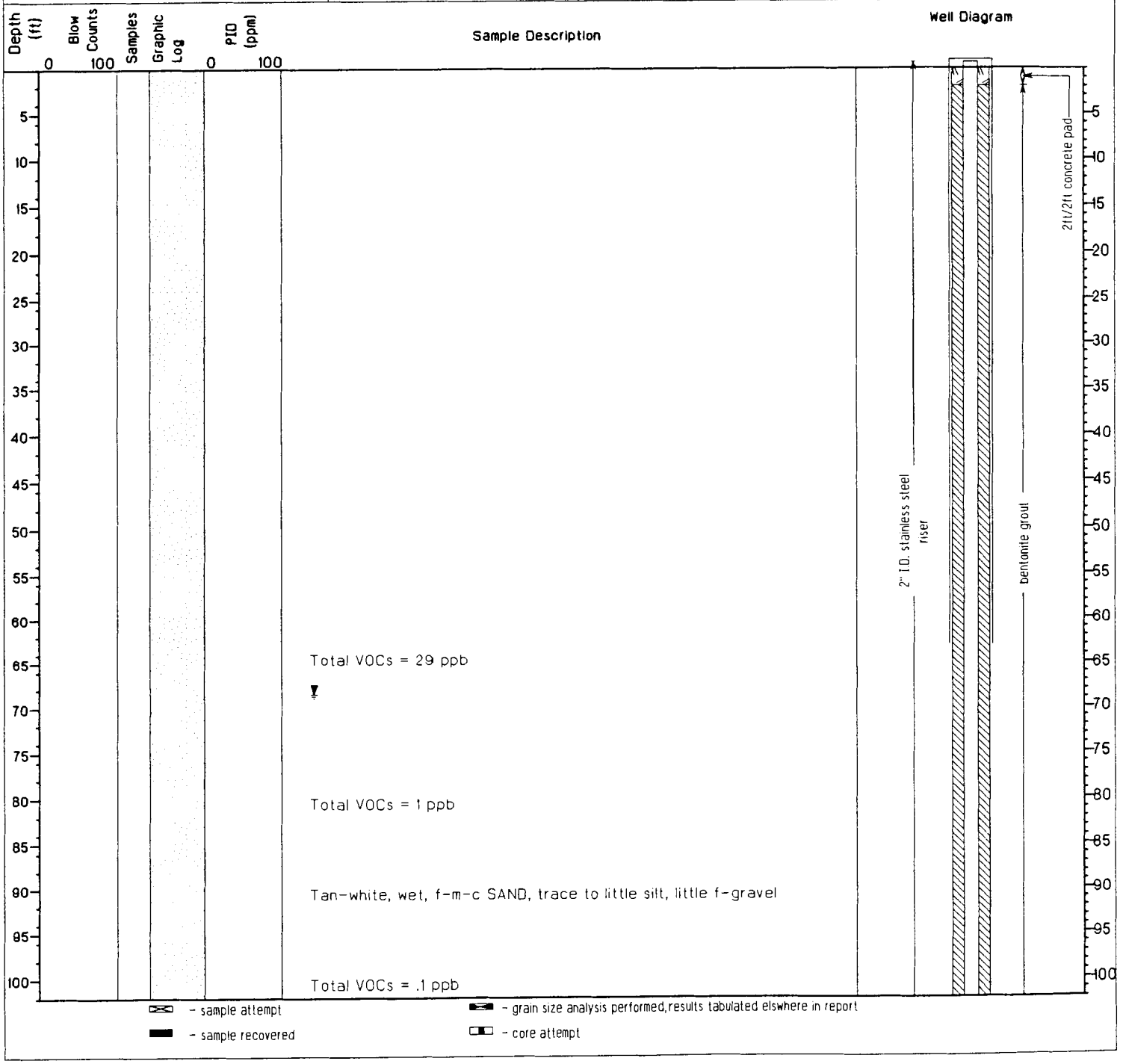
Drilling Method: MUD ROTARY

Weather: Overcast 55F

Elevation

X coord: feet
Y coord: feet

Groundwater Observations
Time : 0700
Date : 5/8/97
Casing Depth: 148
Boring Depth: 180
Water Depth : 65.03



Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: GEN. INST. HICKSVILLE

Job No. 41623ZA

Start
Date 4/30/97 Time

Finish
Date 5/2/97 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: W-16-148

Drilling Company: ADT-MA

Driller: T. PRESIMMONE

S&W Inspector: S&W--CEF

Drill Rig Type: CANTERRA CT-250

Drilling Method: MUD ROTARY

Weather: Overcast 55F

Elevation

X coord: feet
Y coord: feet

Groundwater Observations
Time : 0700
Date : 5/8/97
Casing Depth: 148
Boring Depth: 180
Water Depth : 65.03

Depth (ft) | Blow Counts | Samples | Graphic Log | PID (ppm) 0 100 | Sample Description | Well Diagram

Total VOCs = .4 ppb

Total VOCs = 786 ppb

Total VOCs = 16 ppb

Total VOCs = 2.7 ppb

Bottom of boring

2" I.D. stainless steel riser

2" I.D. 0.010" stainless steel screen

bentonite grout

bentonite pellets

#0 sand pack

107 112 117 122 127 132 137 142 147 152 157 162 167 172 177 182 187 192 197 202

- sample attempt
- sample recovered
- grain size analysis performed, results tabulated elswhere in report
- core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: GEN. INST. HICKSVILLE

Job No. 41623ZA

Start
Date 5/5/977 Time
Finish
Date 5/6/97 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: W-17-130

Drilling Company: ADT-MA

Driller: T. PRESIMMONE

S&W Inspector: S&W--CEF

Drill Rig Type: CANTERRA CT-250

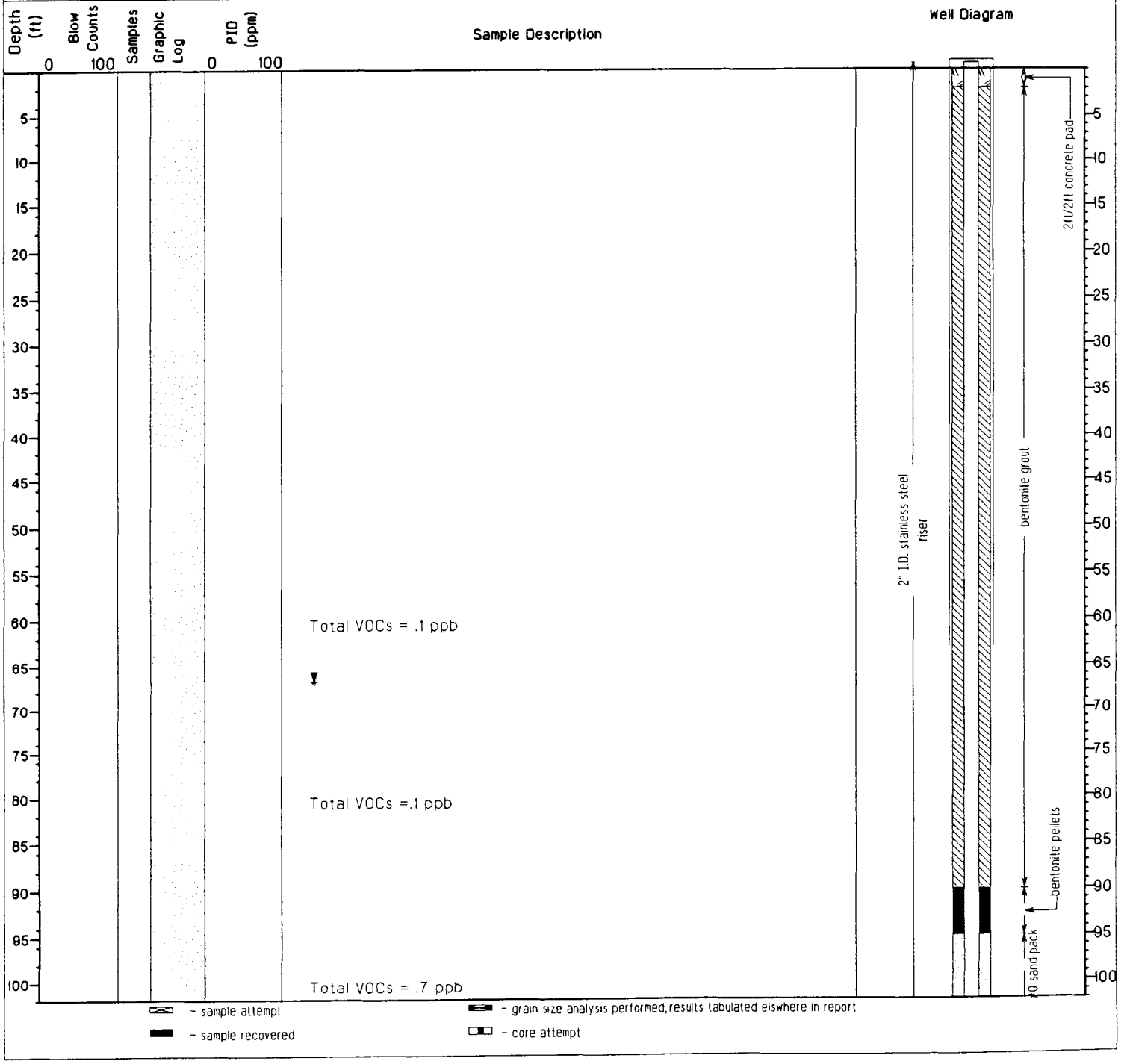
Drilling Method: MUD ROTARY

Weather: Overcast, light rain

Elevation

X coord: feet
Y coord: feet

Groundwater Observations
Time : 0700
Date : 5/7/97
Casing Depth: 130
Boring Depth: 204
Water Depth : 65.64



Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: GEN. INST. HICKSVILLE

Job No. 41623ZA

Start
Date 5/5/977 Time
Finish
Date 5/6/97 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: W-17-130

Drilling Company: ADT-MA

Driller: T. PRESIMMONE

S&W Inspector: S&W--CEF

Drill Rig Type: CANTERRA CT-250

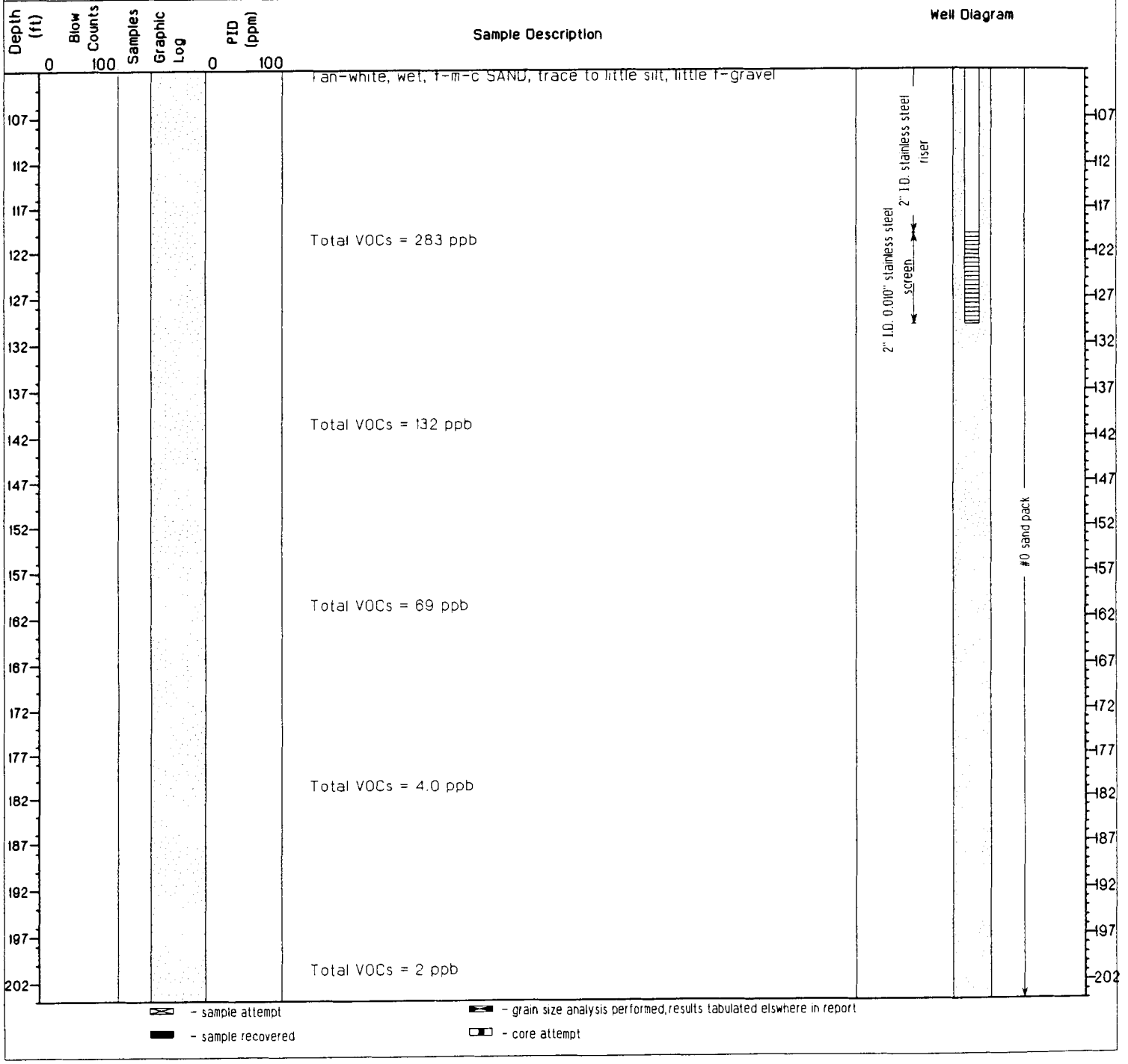
Drilling Method: MUD ROTARY

Weather: Overcast, light rain

Elevation

X coord: feet
Y coord: feet

Groundwater Observations
Time : 0700
Date : 5/7/97
Casing Depth: 130
Boring Depth: 204
Water Depth : 65.64



- sample attempt
- sample recovered
- grain size analysis performed, results tabulated elswhere in report
- core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

McLaren Hart
ENVIRONMENTAL ENGINEERING CORPORATION

July 30, 1997

Mr. Larry Hineline
Stearns & Wheler, LLC
One Remington Park Drive
Cazenovia, New York 13035

Re: Radiological Investigation Report for the General Instrument site, Hicksville, New York, McLaren/Hart Proposal # CL97-0151

Dear Mr. Hineline:

In accordance with the scope of work outlined in McLaren/Hart Proposal CL97-0151, ground water sampling and radiological analyses have been completed for the General Instrument Site in Hicksville, New York and are summarized in this letter report. Prior to the field work, McLaren/Hart completed a review of existing NRC and NYSDEC radiological sampling results for up gradient areas to the site and the O'Brien & Gere Work Plan dated April, 1997. Based on this review and discussions with Stearns & Wheler (Larry Hineline), additional ground water samples were collected and analyzed for radiological constituents. The purpose of the sampling was to determine concentrations of radionuclides of interest and to assess potential impacts to the soil-vapor extraction (SVE) system and worker health and safety during SVE operations at the General Instrument site. Sampling results were used to determine if a need exists to develop recommendations for health and safety controls and/or radiological monitoring of field personnel and equipment during SVE operations.

McLaren/Hart completed ground water sampling during the week of July 13, 1997 and submitted samples to the IEA laboratory in North Carolina for analyses. Findings of the field sampling activities and analytical results for radionuclide concentrations measured in the ground water samples are discussed below and are presented in Tables 1 and 2.

Ground Water Sampling

Groundwater Sampling Approach
Based on our review of the O'Brien and Gere Work Plan and associated sampling data, McLaren/Hart identified the need for additional sampling in order to adequately evaluate the potential for radionuclides to migrate to the SVE system and to assess potential impacts to the extraction system. Additional data was also required to determine if the operation of the SVE system could pose a radiological health concern to on-site personnel and what protection, if any, would be required to safely operate the system. McLaren/Hart concluded that there was insufficient information regarding radiological constituents in the area to determine potential

impacts to the SVE system and on-site workers. The review noted elevated gross alpha levels measured at the up gradient recharge basin # 4 and identified this as a source of radiological contamination that has the potential for impacting the SVE system in the future. McLaren/Hart proposed sampling of existing wells within the vicinity of the SVE system and in areas up gradient to the General Instrument site. McLaren/Hart also recommended construction of two additional wells (one shallow and one deep) between the SVE area and recharge basin # 4, directly up gradient along the ground water flow path. However, for purposes of this preliminary review, McLaren/Hart was asked to sample only existing wells for determining potential impacts to the SVE system. As a result samples were collected from SVE wells and wells located up gradient from the General Instrument property These include W-1, W-1D, W-3, W-3D, and W-8. Each sample was analyzed for the following radiological constituents:

U-234	Th-232	Gross Alpha
U-235	Th-230	
U-238	Th-228	

Ground Water Sampling Results

The scheduled ground water well sampling at the General Instrument Site began on Tuesday July 8, 1997 and included the above mentioned on site wells. These existing wells were selected for ground water sampling due to their location in regards to the historical operations at the former Sylvania Site (just north of the General Instrument Site). The former Sylvania Site historically manufactured nuclear fuel elements through several processes, using uranium mixtures and other metals. These manufacturing processes generated a variety of radioactive wastes, some of which were historically disposed of on site. Specifically, just north of the General Instrument Site, which is now occupied by Air Techniques, a former uranium recharge basin exists. This recharge basin received uranium contaminated wastes and a variety of other wastes during the past operations at GTE Sylvania.

Ground water wells W-3 and W-3D were selected for sampling because they are the closest down gradient wells from the historical uranium recharge basin (recharge basin #4), located approximately 100-150 feet up gradient. These wells are also down gradient from one of Air Technique's monitoring wells, MW-02, which has consistently shown elevated levels of gross alpha since installation. Well W-8 is down gradient of the Nassau County Driving Range, where elevated activities of uranium in soil samples have been measured. Wells W-1 and W-1D were selected for sampling because they are the closest wells to the proposed SVE operation.

Field Parameters

All five on site wells had water level measurements conducted and were allowed to equilibrate before purging took place. Each well was purged by hand bailing approximately three times the amount of water inside each well at the time of sampling. Field parameters were taken of both pre purge well water and sampling water and included; pH, specific conductance, turbidity,

dissolved oxygen, temperature, and salinity. The results for each well are provided in Table 1 of this preliminary report. The purge time for each well varied between nine minutes and two and a half hours, depending on the amount of water in the well (information also provided in Table 1). Each well had one liter of sample volume extracted for each scheduled analysis, which included the following;

(1) gross alpha/gross beta,
(2) uranium isotopes: U-234, U-235, and U-238,
(3) thorium isotopes: Th-228, Th-230, and Th-232.

The extracted sample volume was placed in nalgene containers already prepared with nitric acid, a preservative used to maintain sample quality until the sample arrives at the analytical laboratory. Each well had several liters of sample volume taken for each of the above analyses, and well W-8 had three times the amount of sample volume extracted for completion of a duplicate, and a matrix spike (quality control parameters conducted by the laboratory). The ground water sampling of the five wells took approximately a day and a half.

The twenty one sample bottles were shipped overnight the following day to IEA laboratories in Cary, North Carolina, a New York certified laboratory, for radiological analysis. McLaren/Hart requested a Level III reporting for these analyses, which included a copy of the chemical separation efficiencies, isotopic preparation logs, and raw count data for each analysis. The desired analyses were scheduled for a seven day turn-around, to expedite conclusions and recommendations concerning the operation of a soil vapor extraction system by Stearns and Wheler. Results of the ground water sampling conducted during the week of July 13th are presented in Table 2 of this preliminary report.

Discussion of Sampling Results

McLaren/Hart requested gross alpha and gross beta analyses to be conducted at each well to serve as a broad indicator concerning the levels of radioactivity at the site. Uranium and thorium isotopes were specifically selected for analysis due to the historical waste disposal operations conducted by GTE Sylvania, and the elevated soil sample measurements reported by NYSDEC and NRC. In order to determine if the radiological sampling results are elevated, a comparison to the applicable regulations was used. Under the Safe Drinking Water Act of 1974 and its amendments, the United States Environmental Protection Agency (USEPA) was instructed to promulgate drinking water regulations for radionuclides and other constituents. In 1976 the EPA promulgated the Interim Regulations for Primary Drinking Waters, which have addressed man-made and natural radioactivity levels in drinking water. The Maximum Contaminant Level (MCL) for gross alpha was set at 15 picocuries per liter (pCi/L), which includes activity from radium isotopes but excludes activities from uranium and radon (the individual MCL for radium-226 and radium-228 was set at 5 pCi/L). The MCL for gross beta and gamma activity was set at 4 millirem per year to total body or critical organ. In order to apply this MCL appropriately, the specific isotope contributing the gross beta or gamma activity must be determined, so that the

appropriate dose conversion factor can be applied and combined with the assumption that a resident is consuming 2 liters of this water a day for 365 days per year.

All uranium and thorium isotopic analyses did not show elevated activity levels. Uranium-234 activity levels ranged from 0.02 - 3.61 picocuries per liter (pCi/L). Activity levels for uranium-235 and uranium-238 ranged from 0 - .19 pCi/L, and .01 - 3.5 pCi/L, respectively. Isotopic analyses for thorium were consistent with the uranium isotopic analyses. However, the activity levels for gross alpha and beta fluctuated more dramatically than the individual isotopic analyses.

Gross alpha analysis ranged in activity from 1.64 - 49.58 pCi/L, with the highest detection occurring in well W-3. This maximum gross alpha activity is approximately 10 times background, and is just over three times the MCL for gross alpha particle radioactivity (15 pCi/L). This MCL was also slightly exceeded at well W-8, with an activity of 17.84 pCi/L. All other gross alpha analyses were below the 15 pCi/L MCL, which excludes activity from radon and uranium. The gross beta activities at the five wells ranged from 4.33 - 40.84 pCi/L, with the highest activity measured at well W-3, 40.84 pCi/L. This gross beta activity is such that isotopic specific analysis would be required to ascertain compliance with the 4 millirem MCL. Consistent with the slightly elevated gross alpha activity at well W-8. the gross beta activity was also slightly higher than the other wells at 10.37 pCi/L. The table below details the slightly elevated activities at wells W-3 and W-8.

Well Number	Gross Alpha Activity	Gross Beta Activity
Well W-3	49.58 +/- 5.03 pCi/L	40.84 +/- 3.13 pCi/L
Well W-8	17.84 +/- 2.64 pCi/L	10.37 +/- 1.18 pCi/L

The combined alpha activities of uranium and thorium at both of these wells do not yield the gross alpha activity measured, and only account for approximately 20 percent of the alpha activity in well W-3 and less than one percent of the activity in well W-8. McLaren/Hart speculates that the elevated levels of gross alpha and gross beta activities may be attributed to isotopes of radium, specifically radium-226 and radium-228 or possibly other alpha-emitting radionuclides that may be present from past operations.

Recommendations

Since results of the sampling indicate gross alpha levels at W-3 and W-8 to be above the federal ground water standard of 15 pCi/L, and gross beta activities maybe exceeding the 4 millirem per year standard, McLaren/Hart recommends that further sampling of these wells be conducted to further determine the isotopes of interest. McLaren/Hart requested that IEA Laboratories conduct a radium isotopic analysis on the left over sample volume from well W-3 in order to

further define the elevated activity measured in this well. The results of this further analysis will be available sometime next week, around August 6, 1997, and will be incorporated as an addendum to this preliminary report.

Based on the July sampling results, it is recommended that periodic radiological monitoring of SVE equipment and operating personnel be implemented in order to circumvent buildup or concentration of radionuclides above applicable radiation protection standards specified by the NRC and other recognized agencies such as the NCRP and ICRP. Knock-out moisture pots of the SVE system would likely be one area that might warrant some level of monitoring to ensure adequate protection to workers and the environment. McLaren/Hart would be pleased to submit an outline of proposed health and safety monitoring and necessary radiological training for Stearns and Wheler personnel to minimize the potential for radioactive material buildup and/or unnecessary radiation exposures to on-site workers.

Based on the outcome of periodic monitoring , McLaren/Hart may recommend other types of radiological monitoring as conditions change at the site during the SVE activities. Depending on the radiation monitoring results, these changes could include either an increase or decrease in the level of monitoring required for adequate worker protection

If you have questions regarding this report, please contact me or Brain Caldwell at the above phone number.

Sincerely;

Jack Buddenbaum

Jack Buddenbaum, CHP
Senior Health Scientist

Enclosures

TABLE 1

Field Parameters During Ground Water Sampling, July 8-9, 1997
General Instruments Site, Hicksville, NY

Well ID	W-1	W-1D	W-3	W-3D	W-8
Depth to Water (ft)	63.86	66.72	66.98	68.71	67.46
Total Depth (ft)*	72.14	118.75	71.10	112.83	71.31
Diameter (in)	4	2	4	4	2
Pre Purge					
pH	5.41	5.76	5.40	5.73	6.36
Specific Conductance (uS/cm)	0.160	0.000	0.100	0.118	0.119
Turbidity	15	49	300	42	291
Dissolved Oxygen (mg/L)	2.10	8.68	12.20	11.36	13.29
Temperature (deg C)	20 1	23.0	19.1	22.0	19.1
Salinity (%)	0.00	0.00	0.00	0.00	0.00
Purge Start	09:30	15:00	14:48	15:44	14:13
Purge End	11:55	15:09	15:26	16:24	14:23
One Volume (gal)	6.2	8.6	2.9	20.0	0.7
Volume Purged	19	26	9	120	2
Purged Method	Bailer	Bailer	Bailer	Bailer	Bailer
Purged Rate (gpm)	<1	<1	<1	<1	<1
Sampling					
pH	5.61	5.50	5.63	5.63	6.20
Specific Conductance (uS/cm)	0.200	0.100	0.100	0.100	0.120
Turbidity	78	50	323	27	250
Dissolved Oxygen (mg/L)	1.98	8.42	11.63	9.52	9.52
Temperature (deg C)	20.8	19.0	20.2	23.2	22.0
Salinity (%)	0.00	0.00	0.00	0.00	0.00
Sampled Date	07.08.97	07.08.97	07.08.97	07.09.97	07.08.97
Sampled Time	12:00	15:05	17:30	12:00	16:30

gal	gallons
gpm	gallon per minute
uS/cm	Microsiemens per centimeter
mg/L	milligrams per liter
deg C	Degrees Centigrade

Notes:

* Depth to bottom of well provided by Stearns and Wheler

TABLE 2

Ground Water Radiological Sampling Results, July 8-9, 1997
General Instrument Site, Hicksville, NY*

Analyte	Well ID Number	Result (pCi/L)	Uncertainty	Well ID Number	Result (pCi/L)	Uncertainty
Gross Alpha	W-1	5.94	1.44	W-1D	1.64	0.73
Gross Beta	W-1	6.73	1.15	W-1D	6.28	0.93
Th-228	W-1	-0.04	0.18	W-1D	-0.03	0.13
Th-230	W-1	0.04	0.08	W-1D	0.01	0.03
Th-232	W-1	0.09	0.08	W-1D	0	0.04
U-234	W-1	0.2	0.09	W-1D	0.04	0.06
U-235	W-1	0	0.04	W-1D	0.02	0.03
U-238	W-1	0.08	0.06	W-1D	0.04	0.04

Analyte	Well ID Number	Result (pCi/L)	Uncertainty	Well ID Number	Result (pCi/L)	Uncertainty
Gross Alpha	W-3	49.58	5.03	W-3D	2.19	0.9
Gross Beta	W-3	40.84	3.13	W-3D	4.33	0.8
Th-228	W-3	1.22	0.23	W-3D	0.02	0.1
Th-230	W-3	1.39	0.22	W-3D	0.06	0.04
Th-232	W-3	0.59	0.14	W-3D	0.01	0.03
U-234	W-3	3.61	0.37	W-3D	0.02	0.06
U-235	W-3	0.19	0.09	W-3D	0	0.02
U-238	W-3	3.5	0.36	W-3D	0.01	0.04

				Duplicate		
Analyte	Well ID Number	Result (pCi/L)	Uncertainty	Well ID Number	Result (pCi/L)	Uncertainty
Gross Alpha	W-8	17.84	2.64	W-8	9.85	1.83
Gross Beta	W-8	10.37	1.18	W-8	9.79	1.12
Th-228	W-8	0.03	0.1	W-8	0.02	0.15
Th-230	W-8	0.09	0.08	W-8	-0.01	0.07
Th-232	W-8	0.01	0.1	W-8	0	0.05
U-234	W-8	0.31	0.1	W-8	0.44	0.13
U-235	W-8	0.03	0.04	W-8	0.01	0.05
U-238	W-8	0.37	0.1	W-8	0.27	0.1

* = All ground water sampling was conducted between July 8-9, 1997