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PILOT PROJECT REPORT

WAUKEGAN MANUFACTURED GAS & COKE PLANT
WAUKEGAN, ILLINOIS

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EXECUTIVE SUMMARY

This report presents the results of a pre-remedial design groundwater pilot project (Pilot Project) completed on behalf of the Waukegan Manufactured Gas and Coke Plant (WCP) Group by Conestoga-Rovers & Associates (CRA). The Waukegan Manufactured Gas and Coke Plant Site occupies 36 acres in Waukegan, Illinois, on a peninsula separating Waukegan Harbor on the west from Lake Michigan on the east. The property and its environs have been part of the industrial/commercial waterfront in Waukegan. The purpose of the Pilot Project was to evaluate the efficacy of mobile, cell-based, low-flow groundwater remediation at the Site and to identify the parameters necessary to design the full-scale extraction and treatment systems. An additional objective of the Pilot Project was to evaluate the effectiveness of geophysical profiles for comparison with monitoring well nest data to determine the usefulness of these profiles for full-scale vertical characterization of groundwater.

A Remedial Investigation/Feasibility Study (RI/FS) was completed at the Site between 1992 and 1998. Site geology consists of near-surface fill materials that were placed over a fine-grained sand unit. The sand unit extends from the ground surface to the top of a low-permeability clayey till unit present at approximately 30 feet below ground surface. Shallow groundwater occurs in the fine-grained sand unit and flows in response to infiltration on the peninsula, discharging to the surrounding surface water. The shallow aquifer contains arsenic, ammonia, phenols, and several other chemical compounds. The most affected portion of the shallow aquifer is found in the lowest 5 feet of the sand unit, approximately 25 to 30 feet below ground surface.

The U.S. Environmental Protection Agency issued a Record of Decision (ROD) for the Remedial Action in September 1999. The selected remedy presented in the ROD included soil and groundwater components. As stated in the ROD, the selected groundwater remedy is a mobile, cell-based, low-flow extraction/treatment/reinjection system. The ROD groundwater remedial objectives are divided into two phases, short-term (Phase 1) and long-term (Phase 2). The short-term goal is mass removal of contaminants in the deep portion of the shallow aquifer and minimize impacts of contaminated groundwater on Lake Michigan and Waukegan Harbor surface water. Subsequently, in Phase 2, the long-term remedial goals are pursued based on monitored natural attenuation.

The stratified distribution of contaminants at the Site observed during the RI was confirmed by the Pilot Project analytical data. The initial concentrations of the analytes were highest in the groundwater samples collected from the deepest monitoring wells and were significantly lower in groundwater samples collected from the wells screened

at higher elevations. These data indicate that the bulk of the contaminant mass lies in the lower few feet of the aquifer. Two test units, the Extraction/Reinjection Unit (E/R Unit) and the Extraction Unit (E Unit), were constructed and operated during the Pilot Project. The E/R Unit was designed to evaluate the effects of extraction and reinjection on the concentrations of contaminant in the aquifer. The E Unit was designed to evaluate the effect of groundwater pumping alone (without groundwater reinjection) on the concentrations of contaminants in the shallow aquifer.

During operation of the pilot units, samples were collected on a regular basis from the monitoring wells and the extraction wells for chemical analysis. Over 700 individual groundwater samples were collected and analyzed during the Pilot Project. As a result, a large database relating to aquifer response during operation of the pilot units was compiled during the Pilot Project. The Pilot Project results clearly demonstrate the efficacy of cell-based low-flow groundwater extraction and reinjection and the appropriateness of biological treatment. The E/R Unit data demonstrated that reinjection lowered the contaminant concentrations in the zone of highest contamination in the shallow aquifer over a relatively short operating period. The data demonstrate that groundwater removal in the E/R Unit was focused on the lower portion of the shallow aquifer where the bulk of the contaminant mass is present. Additionally, the groundwater reinjection effect prevents groundwater from outside the E/R Unit from entering and re-contaminating the remediation zone. By contrast, the analytical data from the E Unit demonstrated no significant downward concentration trends in the most contaminated zones indicating that groundwater pumping alone had no effect on the concentrations of contaminants in the aquifer. This is the result of an effectively unlimited source of contaminants under the conditions of the study.

The hydraulic conductivity value used to design the Pilot Project was 30 feet/day. However, the response test and bromide tracer data generated during the Pilot Project suggest that the hydraulic conductivity of the shallow aquifer lies closer to 10 feet/day. The implications of the aquifer hydraulic conductivity must be considered to optimize full-scale system design. This would include groundwater modeling to assess the effects of hydraulic conductivity and aquifer gradients on optimal well spacing, screened intervals, pumping rates, and length of operation.

Target parameter removal was excellent during the treatability study. An average conversion of ammonia to nitrate (nitrification) of approximately 60 percent was achieved within the planning and design parameters of the bench-scale study completed. Nitrification works but the parameters required for successful scale up of the biological reactor to achieve nitrification were not defined. It is recommended that a follow-up bench-scale system be operated to address the following:

a) longer acclimatization and operation period so stable biological treatment operation is achieved;

b) parallel operations of biological treatment processes with and without arsenic pretreatment to monitor the fate of arsenic in the biological process.

c) a more representative groundwater influent concentration will be used to duplicate long-term steady state influent concentrations as opposed the startup concentrations used in the Pilot Project treatability study.

The Pilot Project data indicate that Ultra-Violet Fluorescence does not appear to be an effective screening tool to delineate contaminants beneath Site. Results from the Electrical Conductivity (EC) monitoring logs indicate that the elevated concentrations of salts present in the lower portion of the upper sand unit are detectable using EC. Consistent with the contaminant concentration data, EC response increased with depth in the aquifer thus may be useful for screening tool for development of a vertical profile of groundwater contamination. EC would need to be used in conjunction with limited confirmational vertical aquifer sampling to determine vertical concentration profiles.

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1.0 INTRODUCTION

This report presents the methodology and results of a pre-remedial design groundwater pilot project (Pilot Project) completed at the Waukegan Manufactured Gas and Coke Plant (WCP) located in Waukegan, Illinois (Site).

1.1 SITE OVERVIEW

The WCP Site occupies 36 acres in Waukegan, Illinois, on a peninsula separating Waukegan Harbor on the west from Lake Michigan on the east (Figure 1.1). The property and its environs have been part of the industrial/commercial waterfront in Waukegan. The sand dunes and beach area adjacent to the WCP Site are used for public recreation. Figure 1.2 provides a plan view of the Site.

Barr Engineering conducted a Remedial Investigation/Feasibility Study (RI/FS) at the Site between 1992 and 1998. The U.S. Environmental Protection Agency (USEPA) issued a Record of Decision (ROD) for the Remedial Action at the Site in September 1999. The selected remedy presented in the ROD included soil and groundwater components.

The Site is underlain by near-surface fill materials that were placed over a fine-grained sand unit. The sand unit extends from the ground surface to the top of a low-permeability clayey till unit present at approximately 30 feet below ground surface. Shallow groundwater occurs in the fine-grained sand unit. Shallow groundwater flows in response to infiltration on the peninsula, discharging to the surrounding surface water. The vadose zone soil and the shallow aquifer at the Site have been affected by past activities. Soil at the WCP Site contains coal tar and arsenic. The groundwater contains arsenic, ammonia, phenols, and several other chemical compounds. The most affected portion of the shallow aquifer is found in the lowest 5 feet of the sand unit, approximately 25 to 30 feet below ground surface.

1.2 PILOT PROJECT OVERVIEW

As stated in the ROD, the selected groundwater remedy is a mobile, cell-based, low-flow extraction/treatment/reinjection system. The ROD groundwater remedial objectives are divided into two phases, short-term (Phase 1) and long-term (Phase 2). The short-term goal is mass removal of contaminants in the deep portion of the shallow aquifer to minimize impacts of contaminated groundwater on Lake Michigan and Waukegan Harbor surface water (ROD, pg. 25). Subsequently, in Phase 2, the long-term

remedial goals are pursued based on monitored natural attenuation (MNA). As noted in the ROD (pg. 26): *"Once the inhibitive concentrations of contaminants have been removed and the nitrate source and oxygenation from treatment re-injection is available in the aquifer, degradation should occur."* In the long-term, attainment of maximum contaminant limits (MCLs) is anticipated.

The ROD states that the design of the Phase 1 groundwater remedy will be based in part on pilot testing of a groundwater extraction and reinjection system. The approved Pilot Project includes the installation, operation, and monitoring of two low-flow, cell-based test units as described herein. The Pilot Project included several data collection tasks, which were implemented to provide the data for developing the design parameters and constraints for implementation, operation, and performance measurement of the extraction/reinjection unit of the ROD groundwater remedy.

This report presents the results of a Pre Design Pilot Project completed on behalf of the WCP Group by Conestoga-Rovers & Associates (CRA). The Pilot Project was completed consistent with the May 23, 2000 Pilot Project Work Plan prepared by New Fields Inc. and the following plans prepared by CRA in June 2000; Sampling and Analysis Plan, Quality Assurance Project Plan, and Treatability Study Work Plan. The Sampling and Analysis Plan was modified in a letter to USEPA dated September 26, 2000. The modification described changes in groundwater extraction rates intended to optimize tracer capture.

Minor modifications made to accommodate field conditions are identified in the report when they occur.

1.3 REPORT ORGANIZATION

The Pilot Project Report has been organized into the following sections:

Section 1.0 Introduction – provides brief overview of the Site and the Pilot Project;

Section 2.0 Study Area Characterization – provides a summary of the investigative activities implemented prior to initiating the Pilot Project;

Section 3.0 Pilot Unit Construction and Operation – discusses the installation and operation of the Pilot Units;

Section 4.0 Pilot Project Data Summary – presents the data collected during the Pilot Project;

Section 5.0 Pilot Project Data Evaluation – discusses and evaluates the collected data;

Section 6.0 Treatability Study - presents the results and findings of the Treatability Study;

Section 7.0 Summary and Conclusions – summarizes the findings of the Pilot Project and provides recommendations; and

Section 8.0 References.

2.0 STUDY AREA CHARACTERIZATION

2.1 OVERVIEW

Prior to initiating the Pilot Project, several study area characterization activities were completed. These study area characterization activities were completed to confirm data collected during the RI and to further define conditions locally within the Pilot Project areas.

2.2 GENERAL FIELD PROTOCOLS

General field protocols utilized during implementation of the Pilot Project are summarized in Appendix A.

2.3 SITE CHARACTERIZATION

2.3.1 GENERAL

The primary objectives for the study area characterization activities were to define the geology and hydrogeology within the Pilot Project study area and to define the initial concentrations of contaminants within the Pilot Project study area. The characterization activities completed included the following:

- measurement of groundwater levels at monitoring wells/piezometers across the Site to confirm groundwater flow conditions beneath the Site;
- completion of single well response test on four monitoring wells to calculate the hydraulic conductivity of the shallow sand aquifer;
- advancement of four direct-push vertical geophysical profiles using cone penetrometer testing (CPT) with Ultra-Violet Fluorescence (UVF) and Electrical Conductance (EC)to identify stratigraphy and to estimate the vertical extent of the impacted portion of the shallow aquifer;
- installation of pilot borings in the Extraction Unit (E Unit) and the Extraction/Reinjection Unit (E/R Unit) to further define subsurface stratigraphy within the Pilot Project area;
- construction of extraction wells and multilevel monitoring wells in the E and E/R Units and reinjection wells in the E/R Unit;
- survey the locations of the extraction, reinjection, and monitoring wells; and

- the collection of initial groundwater samples from the extraction wells and from each level of the multi -level monitoring wells.

2.3.2 GROUNDWATER LEVELS

The depths to groundwater and total well depths were measured and recorded on July 11, 2000 at 36 of the monitoring wells/piezometers installed during the RI. Measurements were recorded to the nearest 0.01 foot using an electronic water level meter. These measurements were made to evaluate the groundwater flow beneath the Site. Figure 1.2 illustrates the monitoring well and piezometers locations.

2.3.3 RESPONSE TESTING

On July 11, 2000, single well hydraulic response tests were performed on four deep monitoring wells (MW-4D, MW-7D, MW-8D, and MW-9D). The location of each of these monitoring wells is presented on Figure 1.2. Response testing was conducted to determine the hydraulic conductivity of the lower portion of the shallow aquifer. These data were also used to complete particle tracking modeling to optimize the tracer test. Two response tests were completed at each of the four monitoring wells. Response testing was performed using rising head methods as outlined below:

- the static water level in the well was measured using an electronic water level meter;
- a 10-pound per square inch (PSI) pressure transducer attached to an electronic data logger was lowered into the well;
- the well head was sealed and pressurized to lower the hydraulic head in the well; and
- Once the air pressure was released the water level recovery in the well was monitored and recorded by the data logger.

Water level recovery data recorded by the data logger were evaluated using the methods developed by Bouwer and Rice[1] using the groundwater modeling computer program AQTESOLV for Windows Version 2.12-Professional.

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1 Bouwer, H. and Rice, R.C. 1976. "A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells", Water Resources Research, 12 (1977), pp. 423-428.

2.3.4 CONE PENETROMETER TESTING

Three direct-push boreholes, CPT-1, CPT-2, and CPT-4, were advanced using CPT with simultaneous measurement of electrical conductivity (CPT/EC) and ultraviolet fluorescence (CPT/UVF). A fourth CPT borehole, CPT-3, was attempted but probe refusal was encountered at a depth of only 4 feet below ground surface (bgs), and the sounding was abandoned. Stratigraphics of Glen Ellyn, Illinois was retained to provide CPT services. CPT/UVF was used in lieu of gas chromatography (CPT/GC) as specified in the Work Plan due to the lack of commercial availability of the CPT/GC technology. The selected locations for CPT/UVF testing were positioned near the proposed locations of the pilot project illustrated on Figure 1.2 of the Work Plan. The locations of the completed CPT borings are illustrated on Figure 1.2 of this report.

CPT consists of using a truck-mounted rig to advance a small diameter (1.7 inch) instrument probe (penetrometer) into the ground while a computer data acquisition system records telemetry received during advancement of the penetrometer probe. Measurements of the resistance to penetration acting on the probe and friction along the sides of the probe are obtained by pressure transducers while the probe is advanced through the subsurface soils. The resistance of the soil to penetration (cone end-bearing or tip resistance) and sliding friction along the walls of the penetrometer are used to identify the subsurface stratigraphy. The cone end-bearing pressures are much higher in sands than in clays. The ratio of sliding friction to cone end-bearing resistance (termed friction ratio) is high in clays and low in sands. These two parameters are interpreted to determine the stratigraphy. CPT soundings were advanced to a depth of approximately 40 feet below ground surface. The boreholes resulting from the CPT soundings were grouted to the surface with bentonite slurry simultaneously as the probe was withdrawn from the ground.

EC measurements were recorded at all testing locations simultaneously with CPT measurements. CPT/EC measurements consist of an electrode array mounted on the CPT probe, which measures soil electrical conductivity. The UVF module consists of a sapphire window in the side of the penetrometer, an UV light source, filters, and photonic sensors. The UVF light source illuminates the soil next to the window. Certain organic compounds fluoresce in the presence of an UVF light source if present at high enough concentrations. The photonic sensors can detect the resulting light. The intensity of the fluorescence can be correlated to the concentration of contamination in the soil. UVF measurements were obtained simultaneously with CPT and EC measurements.

2.3.5 PILOT SOIL BORINGS

Pilot soil borings were installed at extraction well locations EW-2 in the E/R Unit and EW-4 in the E Unit using hollow-stem auger drilling methods. Visual observations from the pilot soil borings were used to confirm stratigraphic information obtained from the CPT soundings and further define the subsurface stratigraphy within the Pilot Project area. During the advancement for the pilot soil borings continuous split-spoon samples were collected. Once a depth of 5 feet below the water table was reached potable water was periodically pumped into the HSA to prevent heaving sands from filling the hollow-stem augers. Soil samples were described in detail by a geologist in accordance with the Unified Soil Classification System (USCS). Extraction wells were constructed in the pilot soil borings. Pilot soil boring stratigraphic logs are presented in Appendix B.

2.3.6 SURVEYING

CPT sounding and monitoring, extraction, and reinjection well locations installed during the Pilot Project were surveyed for horizontal and vertical control. North Central Land Survey Company, Inc., of Lake Bluff, Illinois, an Illinois-registered land surveyor, was retained to provide surveying services. Locations were surveyed to the nearest 0.5 foot for horizontal control and to the nearest 0.01 foot for vertical control. Survey measurements were referenced to the benchmark established during the RI. Vertical coordinates were referenced to U.S. Geological Survey (USGS) Average Mean Sea Level (AMSL) datum.

3.0 PILOT UNIT CONSTRUCTION AND OPERATION

3.1 OVERVIEW

Two test units, the E/R Unit and the E Unit, were constructed and operated during the Pilot Project. Construction of these units required the installation of a number of injection wells, extraction wells, and multi-level groundwater monitoring wells. During the Pilot Project, groundwater was extracted from each of these pilot units. The extracted water from each pilot test unit was temporarily stored in four 20,000-gallon equalization tanks. Simultaneous tap water injection and groundwater extraction was performed in the E/R Unit. The Pilot Project also included groundwater sampling for chemical analyses and a bromide tracer study in the E/R Unit. Specific information concerning the installation and operation of each of the pilot units is provided in this section. Figure 1.2 illustrates the location of the Pilot Project Area in relation to the Site.

3.2 PRE-STUDY GROUNDWATER MODELING

Pre-study groundwater modeling of the tracer test program outlined in the Work Plan was conducted to evaluate tracer test operating conditions. Groundwater information obtained from the study characterization groundwater level monitoring and hydraulic response testing were used to model the groundwater flow conditions within the E/R Unit during the tracer test. A three-dimensional groundwater flow model (MODFLOW-96) was developed to approximate the hydrogeologic conditions in the immediate vicinity of the E/R Unit. Particle tracking simulations were conducted to evaluate the proposed Pilot Project tracer test outlined in the Work Plan.

In general, modeled particle tracking simulation results suggested that, based on revised estimates of the hydraulic conductivity within the sand unit, an extended time period would be required to obtain capture of an adequate quantity of bromide. Based on these results, a modification to the tracer test was proposed to increase the probability that good capture of bromide would be achieved during the tracer test. The proposed modification consisted of switching the reinjection rates to an unbalanced configuration to create a downgradient hydraulic barrier. Groundwater particle tracking simulations indicated adequate bromide capture could be achieved in a much shorter period under the modified reinjection configuration.

3.3 PILOT UNIT CONSTRUCTION

3.3.1 UNIT DESCRIPTIONS

Extraction/Reinjection Unit (E/R Unit)

The E/R Unit is comprised of three extraction wells and six reinjection wells. This unit was intended to simulate the simultaneous operation of low-flow extraction and reinjection wells. The outer reinjection wells supplied flushing water that was designed to enhance the removal efficiency of the inner extraction wells. Figure 3.1 illustrates the configuration of extraction wells, reinjection wells, and groundwater monitoring wells in the E/R Unit.

Extraction Unit (E Unit)

The E Unit was operated over four one-week cycles, at progressively lower extraction rates during successive each operational cycle. The first three operational cycles were followed by a one-week shut down period.. The removal efficiency of the extraction well was evaluated under constant versus intermittent (pulse) operation, as well as different extraction rates. Figure 3.1 depicts the configuration of the extraction well and groundwater monitoring wells in the E Unit.

3.3.2 EXTRACTION AND REINJECTION WELL INSTALLATION

The boreholes for the extraction/reinjection wells were advanced approximately 1 foot into the top of the glacial till unit, present at a depth of approximately 32 feet below ground surface. Boreholes were advanced using a rotary drill rig equipped with 4.25-inch inside diameter hollow-stem augers. The extraction and reinjection wells were constructed such that the bottoms of the well screens were placed slightly below the glacial till interface.

Specific installation protocols for the extraction and reinjection wells are summarized in Appendix A.

Table 3.1 provides a summary of extraction and reinjection well construction details. Stratigraphic and instrumentation logs for the extraction and reinjection wells are provided in Appendix B.

3.3.3 MONITORING WELL NESTS

Monitoring well nests, each consisting of a cluster of five monitoring wells, were installed to provide a vertical profile of groundwater quality during the Pilot Project. Two monitoring well nests, WN-1 and WN-2, were installed in the E/R Unit and one monitoring well nest, WN-3, was installed in the E Unit. System layouts for the E/R Unit and the E Unit are illustrated on Figures 3.1. This figure also illustrates cross-sectional views through each of the units.

Specific installation protocols for the monitoring well nests are summarized in Appendix A.

Table 3.1 provides a summary of monitoring well construction details. Stratigraphic and instrumentation logs for the monitoring well nests are provided in Appendix B.

3.3.4 WELL DEVELOPMENT

In order to establish good hydraulic communication with the aquifer and reduce the volume of sediment in the monitoring, extraction, and reinjection wells, well development was conducted. Well development was completed several weeks prior to starting the Pilot Project.

Specific protocols for the development of the monitoring, extraction and reinjection wells are summarized in Appendix A.

Tables 3.2 and 3.3 provide summaries of the field parameters measured during development of the extraction and reinjection wells, and monitoring well nests, respectively.

3.3.5 PRE AND POST PILOT PROJECT GROUNDWATER MONITORING

Groundwater samples were collected from the E and E/R Units prior to the initiation of the Pilot Project (pre-extraction groundwater extraction) and again 1 week and 4 weeks following shutdown of the E and E/R Units (post-extraction groundwater monitoring). Groundwater samples were also collected from the E/R Unit prior to beginning Phase II of the E/R Unit testing (bromide tracer test). Pre-extraction groundwater sampling was performed within 24 hours of the startup of groundwater extraction or extraction/injection in the pilot units. Specific details on the protocols used to collect

groundwater samples are provided in Appendix A. Table 3.4 provides a summary of the field parameters measured during monitoring well purging. Table 3.5 summarizes the analytical methods for the Pilot Project.

Groundwater extraction commenced in the E Unit on October 2, 2000 and the last groundwater extraction cycle was completed on November 20, 2000. Groundwater extraction commenced in the E/R Unit on October 9, 2000 and the Phase I (contaminant removal) test was completed on October 23, 2000, when the pumps were turned off. Groundwater extraction associated with the Phase II (bromide tracer) test in the E/R Unit began on October 24, 2000 and continued until November 20, 2000. Pre-extraction groundwater samples were collected from each of the groundwater monitoring wells in well nest WN-3 in the E Unit on October 2, 2000, and each of the groundwater monitoring wells in well nests WN-1 and WN-2 in the E/R Unit on October 9, 2000. Pre-extraction groundwater samples collected from the E Unit and the E/R Unit were analyzed for target compound list (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), total arsenic, ammonia, cyanide, thiocyanate, and total phenolics.

Post-extraction groundwater samples were collected from each of the groundwater monitoring wells in well nest WN-3 in the E Unit and each of the groundwater monitoring wells in well nests WN-1 and WN-2 in the E/R Unit. Post-extraction groundwater samples were collected from these locations at approximately one week and four weeks following shutdown of the pilot units. Post-extraction groundwater samples were collected from the well nests in the E and E/R Units on November 27, 2000 and December 18, 2000. Post-extraction groundwater samples collected from the E Unit and the E/R Unit were analyzed for TCL VOCs, TCL SVOCs, cyanide, thiocyanate, total phenolics, ammonia, and total arsenic.

Quality control (QC) samples collected during pre- and post-extraction groundwater monitoring events include field duplicates and matrix spike/matrix spike duplicate samples. QC samples were collected at the frequency specified in the QAPP. A laboratory-supplied trip blank was placed in each sample cooler containing multiple aqueous samples for TCL VOC analysis. In accordance with the approved Work Plan, QC samples were not collected during operational phase of the E/R and E Units.

3.4 OPERATION OF PILOT UNITS

3.4.1 OPERATION OVERVIEW

Groundwater was extracted from each of these pilot units during the Pilot Project. The extracted water from the Pilot Project is temporarily stored in four 20,000-gallon equalization tanks. Specific information concerning the operation of each of the pilot units is provided in this section.

Groundwater Extraction

During the Pilot Project, extraction and reinjection wells were pumped using peristaltic pumps and long-life tubing that discharge through in-line flow meters. Peristaltic drive pumps were Masterflex LS® Model 7553-70 or 7553-80 (lower flow rates), variable-speed, modular drive pump. Each drive pump was equipped with from one to three modular pump heads per controller that were capable of sustained flow rates within the desired range.

Each discharge line was equipped with a direct-reading inline Blue-White flow meter Model F-44250LH-8 for 0.025 – 0.25 gallons per minute (gpm) or Model F-44375LH-8 for 0.1 – 1.0 gpm. The inline flow meters were used to estimate the flow rates; actual flow rates were verified on a daily basis using a 1,000 milliliter (ml) graduated cylinder and a stopwatch. Extracted groundwater was directed to an intermediate 2,500-gallon storage tank. The 2,500-gallon tank was equipped with a float activated submersible pump and piping which discharged to the 20,000-gallon storage tanks. Figure 3.2 provides a schematic view of the groundwater extraction setup.

3.4.2 E/R UNIT OPERATION

The E/R Unit consisted of three extraction wells, six reinjection wells, and two monitoring well nests (see Figure 3.1). The E/R Unit was operated in two phases over a total of 42 days (6 weeks). Phase I operations were intended to evaluate the mass removal efficiency of the system under the extraction, treatment, and reinjection scenario. Phase II operations were intended to evaluate contaminant transport times through the completion of a bromide tracer test.

Tap water was injected into each of the six reinjection wells that comprise the E/R Unit. Reinjection water was staged on Site in a 1,500-gallon capacity tank that was filled daily with tap water. Tap water was obtained from an outdoor spigot at the adjacent

Outboard Marine Corporation (OMC) IT Building. Tap water was pumped into each reinjection well using peristaltic pumps, long-life tubing and inline flow meters.

3.4.2.1 PHASE I – MASS REMOVAL

Phase I of the E/R Unit operation was started on October 9, 2000 and ran through October 23, 2000. During Phase I operations numerous groundwater samples were collected and analyzed to evaluate the mass removal efficiency of the system under the extraction, treatment, and reinjection scenario. During Phase I, the E/R Unit was pumped at a constant low-flow rate of approximately 3 liters per minute (L/min) (approximately 1 L/min from each extraction well) for a period of 2 weeks. Contemporaneously with groundwater extraction, tap water was injected into the reinjection wells at a rate of approximately 0.5 L/min through each of 6 reinjection wells for a total of approximately 3 L/min.

After 2 weeks of operation, the E/R Unit was shut down on October 23, 2000 for 1 day to allow the groundwater within the E/R Unit to stabilize prior to initiating Phase II.

3.4.2.2 PHASE II - TRACER TEST

Phase II of the E/R Unit operation consisted of a bromide tracer test, which was started on October 24, 2000 and ran through November 20, 2000. Bromide is considered a "conservative" tracer (one which travels at nearly the same velocity as groundwater). Pre-extraction groundwater samples were collected from reinjection wells RW-1, RW-2, and RW-3, extraction wells EW-1, EW-2, and EW-3, and monitoring well nests WN-1 and WN-2 within 24 hours of starting the tracer test to evaluate the natural bromide concentrations prior to the tracer test.

The bromide tracer was injected immediately prior to the startup of the Phase II E/R Unit operation. The laboratory-prepared potassium bromide solution was injected directly into reinjection well RW-2 (the center well of the western reinjection well triplet). The bromide tracer was introduced to RW-2 using the following procedure.

i) The bromide tracer consisted of 1,180 grams of potassium bromide (792 grams of bromide) dissolved in 1.8 liters of deionized water. The bromide tracer solution was prepared by the project laboratory and delivered to the Site in solution ready for injection.

ii) Prior to injecting the bromide tracer, the depth to water was measured in injection well RW-2. The water level was measured to the nearest 0.01 foot using a calibrated electronic water-level meter and recorded in the field log.

iii) The bromide tracer solution was injected into the center, upgradient reinjection well (RW-2) at 08:30 a.m. on October 24, 2000.

iv) The bromide tracer was injected into RW-2 using a peristaltic pump at a flow rate not exceeding 100 mL/min. The injection tube was slowly moved up and down through the screened interval of RW-2 to allow mixing and a more equal distribution of tracer in the screened interval.

v) Following a 30-minute equilibration period, a groundwater sample was collected from RW-2 for bromide analysis to obtain the initial concentration of the tracer in the reinjection well. RW-2 was not purged prior to collection of this sample to minimize removal of tracer from the well.

vi) The pumps in the E/R Unit were started at 11:00 a.m. on October 24, 2000, beginning the Phase 2 operation.

During Phase II, the reinjection flows were reconfigured to optimize the recovery of bromide tracer. During Phase II the reinjection flow rates were switched to being unbalanced. This unbalanced flow was initiated to concentrate the flow path within the center of the E/R Unit to facilitate a nearly direct flow path from reinjection well RW-2 to extraction well EW-1. The unbalanced flow pattern was intended to maximize the recovery at EW-1 of the bromide injected at RW-2. The extraction rate from each extraction wells remained at approximately 3 L/min per well. The injection rate at the west bank of reinjection wells was reduced to approximately 0.21 L/min per well, and the injection rate at the east bank of reinjection wells was increased to approximately 0.91 L/min per well.

3.4.2.3 E/R UNIT MONITORING

The groundwater monitoring wells in both of the monitoring well nests installed in the E/R Unit were sampled at regular intervals during operation of the E/R Unit. Sampling of the water purged from each extraction well of the E/R Unit was also performed at regular intervals during operation of the E/R Unit. Water levels within the E/R Unit were monitored daily.

Water samples were collected at the frequencies and for the analytes summarized in Table 3.6. During the first week of Phase I operation, groundwater samples were collected twice each day. Consistent with the approved Sampling and Analysis Plan

(SAP), at least one of the 2 per day groundwater samples collected during the first week of operation, was analyzed by the project laboratory. The second of the 2 per day groundwater samples collected the first week of operation was archived by the laboratory until the results of the original samples were received. Selected archived samples were analyzed, as needed, to provide better definition of contaminant concentration trends during operation of the E/R Unit.

Additional groundwater samples were also collected from the well nest WN-1 on Day 8 and Day 10 to be analyzed if the contaminant concentration trends required better definition based on data received from the original samples.

Bromide monitoring began when the reinjection flow rates were changed to the Phase II unbalanced flow configuration. Bromide monitoring was conducted in accordance with the frequency identified in Table 3.6. During the first week of Phase II, groundwater samples were collected twice each day for bromide analysis. At least one of the 2 per day groundwater samples collected during the first week of Phase II operation was analyzed for bromide by the project laboratory. The second of the 2 per day samples collected the first week of Phase II operation was archived by the laboratory until the results of the original samples were received. Selected archived samples were analyzed for bromide, as needed, to provide better definition of bromide concentration trends.

3.4.3 E UNIT OPERATION

3.4.3.1 GROUNDWATER EXTRACTION

The E Unit is comprised of one extraction well (EW-4) and one monitoring well nest (WN-3) (see Figure 3.1). The E Unit was operated under both steady state and cyclic conditions, utilizing four different extraction rates. The E Unit was operated under an cyclical extraction schedule with the pump on for 7 days and then off for 7 days. Four cycles were completed with the extraction rate from the E Unit being reduced with each successive pumping cycle.

The first cycle began on October 2 and ended on October 9, 2000, consisted of groundwater extraction at an average rate of approximately 2.8 L/min. The pumping rate during each of the successive extraction cycles was reduced. The second cycle (October 16 through 23, 2000) was operated at an average rate of approximately 2.1 L/min, the third cycle (October 30 through November 6, 2000) was operated at an average rate of 1.4 L/min, and the fourth cycle (November 13 through 20, 2000) was operated at an average rate of 0.75 L/min.

3.4.3.2 E UNIT MONITORING

The groundwater monitoring well nest WN-3 was sampled three times per week during E Unit operation. At least one groundwater sampling event each week was conducted on the same day that the pump operational mode was changed (i.e., pumping started or stopped). One groundwater sampling event was also conducted during the midpoint of each extraction cycle. Sampling of the water purged from the E Unit extraction well was also conducted three times per week. Water levels within the E Unit wells were monitored daily during operational phases.

Water samples were collected at the frequencies and for the analytes summarized in Table 3.6.

3.5 PILOT PROJECT SAMPLING PROTOCOLS

During the Pilot Project numerous groundwater samples were collected from the pilot units and analyzed to evaluate contaminant concentration trends. Prior to the collection of groundwater samples, field measurements for hydrogen ion activity (pH), specific conductivity, oxidation-reduction potential (ORP), dissolved oxygen (DO), turbidity, and temperature were measured and recorded. The following provides a brief summary of the groundwater sampling procedures.

3.5.1 MONITORING WELLS

Groundwater samples collected from the pilot unit monitoring wells during the operational phase of the Pilot Project were collected in accordance with the protocols presented in Appendix A, except that purging of the pilot unit monitoring wells prior to sampling was not performed while groundwater extraction was occurring except for a limited volume of groundwater necessary to allow equilibration of the probes used to measure field parameters (to obtain accurate field parameter measurements). In accordance with the approved Work Plan, QC samples were not collected during operational phase of the E/R and E Units.

3.5.2 EXTRACTED GROUNDWATER

Sampling of the groundwater purged from the extraction wells in the E/R and E Units was performed at regular intervals during the Pilot Project. Table 3.6 provides a summary of the frequency and analytical parameters for the sampling program. Extracted water samples were collected from the extraction wells in accordance with the following protocols.

i) A new pair of disposable nitrile gloves was used for each sample.

ii) Samples were collected from the discharge tube of the peristaltic pump.

iii) Containers were filled using techniques that minimize sample agitation. Groundwater samples were collected from the equipment used to purge the monitoring well as described above. Groundwater samples were collected in order of decreasing analyte volatility.

iv) Samples were assigned a unique sample identification number and placed into an iced cooler, pending delivery to the project laboratory (see Appendix A).

3.5.3 TAP WATER TESTING

Tap water injected into the reinjection wells of the E/R Unit was analyzed three times per week for residual chlorine, pH, and dissolved oxygen. Dissolved oxygen and pH were measured by inserting direct-reading field instruments into the tap water holding tank. Field instruments were calibrated in accordance with manufacturer's specifications. Residual chlorine was measured in the field using chlorine test paper. The test paper was dipped into the tap water holding tank and compared to a color-coded chart to obtain the residual chlorine concentration.

3.5.4 REAL-TIME MONITORING

Specific conductance of the effluent from the central extraction well of the E/R Unit and the extraction well of the E Unit was monitored for specific conductance continuously during the Pilot Project. The central extraction well in the E/R Unit and the E Unit extraction well were equipped with a downhole data logger/pressure transducer capable of measuring hydraulic pressure and specific conductance. However, data logger malfunctions prevented these data from being collected. Backup readings of specific conductance and water levels were manually measured and recorded daily with field instrumentation.

3.5.5 TREATABILITY TESTING

On October 30, 2000 the extracted water sample for the treatability study was collected from the first of the equalization tanks filled during the Pilot Project. Water was purged from the center of the equalization tank using an electronic submersible pump. The water sample was collected into 15 new 5-gallon plastic buckets. Each of the buckets was sealed, placed into a plastic bag, and packed into individual cardboard boxes containing vermiculite. Treatability samples were shipped via overnight courier to CRA's Waterloo, Ontario Canada office for the treatability study.

3.6 OTHER DATA

3.6.1 WEATHER CONDITIONS

Data on weather conditions including temperature, barometric pressure, wind speed and direction, precipitation, and relative humidity were obtained from the National Weather Service Station located in Waukegan, Illinois. The weather information was obtained from the National Oceanic and Atmospheric Administration (NOAA) World Wide Web site[2].

3.6.2 LAKE LEVELS

Information regarding the levels of Lake Michigan during the Pilot Project was obtained from the United States Army Corps of Engineers World Wide Web site[3].

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2 www.ncdc.noaa.gov

3 www.lre.usace.army.mil

4.0 PILOT PROJECT DATA SUMMARY

4.1 OVERVIEW

A significant amount of data was collected during the Pilot Project. These data included water levels, field parameter measurements, weather data, lake water levels, and analytical data from over 700 groundwater samples. The following sections present the data collected from the Pilot Project.

4.2 ANALYTICAL DATA COMPILATION AND VALIDATION

4.2.1 ANALYTICAL DATA

Analytical services were provided by En Chem Inc. of Madison Wisconsin (En Chem). Sample analyses were completed in accordance with the protocols outlined in the QAPP. Analytical data were reported in both hard copy and electronic formats. The electronic format data was imported into Microsoft Access. Access is a data base program, which allows manipulation of the data to support further evaluation and interpretation of the data. An electronic version of the final analytical reports from En Chem is provided in Appendix C.

4.2.2 QUALITY ASSURANCE/QUALITY CONTROL

Validation of the analytical data produced by the project laboratories was performed by the CRA project QA/QC Officer based on the relevant criteria cited in the Site-specific QAPP. The evaluation of the analytical data for accuracy and precision was based on an assessment of QA/QC information which included field duplicate sample results, laboratory method blank data, laboratory duplicate data, matrix spike/matrix spike duplicate surrogate compound spike, and laboratory check sample recovery data. Based upon the results of the data quality assessments and validations, the analytical data are suitable for the intended use in this project with limited exceptions. Data qualifiers were assigned as appropriate and are included in each data summary table. The data validation memoranda for analytical data generated during the Pilot Project are provided in Appendix D.

4.3 GEOLOGY AND HYDROGEOLOGY

4.3.1 SITE STRATIGRAPHY

A detailed discussion of the geology and hydrogeology of the Site is provided in the RI Report. In general, the surficial deposits in the vicinity of the Site consist of shallow near-shore lake sediments. The RI classified these sediments as deposits of the Dolton Member of the Equality Formation. This unit was predominantly medium-grained sand with gravel.

A relatively thick gray clay and sandy clayey till underlie the upper sand. The RI classified this till as being part of the Wadsworth Till Member of the Wedron Formation. The unconsolidated deposits in the region were reported in the RI to be between 50 and 200 feet thick. Reportedly the till is underlain by Silurian dolomite bedrock.

4.3.2 PILOT PROJECT AREA STRATIGRAPHY

The ground surface within the Pilot Project area is at an approximate elevation of 585 feet above mean sea level (AMSL). The stratigraphy in the study area was confirmed through the collection and inspection of split-spoon soils samples collected at extraction wells EW-2 and EW-4 (see Appendix B). Figure 4.1 illustrate a geologic cross-section through the Pilot Project area. The area is covered by fill materials consisting of a dark brown to black sand with gravel and varying amounts of slag. A thin layer of clay was encountered in EW-4. Concrete and rubble were also encountered within the fill during installation of the Pilot Units. The thickness of the fill units ranged from 4.9 feet at EW-4 to 7.4 feet at EW-2.

The fill material was underlain by a grayish brown fine- to medium-grained sand with a trace of silt and gravel. The sand deposit became finer grained with depth and darker in color. A thin well-graded silty gravel layer was encountered at the base of the sand unit. This gravel layer ranged from 0.3 to 0.5 feet in thickness at extraction wells EW-2 and EW-4, respectively. A glacial till unit underlies the sand and gravel. The glacial till was a very stiff gray silt with sand and gravel. The glacial till was encountered at depths of 30 feet bgs (555 feet AMSL) and 31.6 feet below ground surface (553.4 feet AMSL) at extraction wells EW-4 and EW-2, respectively.

Groundwater was encountered at a depth of approximately 4 feet below ground surface (581 feet AMSL).

4.3.3 GROUNDWATER FLOW

On July 11, 2000, the depth to groundwater and total well depth were measured and recorded at 36 monitoring wells/piezometers to the nearest 0.01 foot using an electronic water level meter. The electronic water level meter was thoroughly rinsed with distilled water between measurement locations. Table 4.1 summarizes the collected measurements. These groundwater measurements and the monitoring well top of casing survey elevations from the RI report were used to calculate groundwater elevations. These data were also used to generate groundwater contour maps illustrated on Figures 4.2 and 4.3, using data from the shallow and deep monitoring wells and piezometers, respectively. These figures illustrate that the Pilot Project area is located over a broad groundwater mound where the hydraulic gradient is minimal. The groundwater flow pattern is radial, away from this groundwater mound. This groundwater flow pattern is similar to the flow patterns observed during the RI.

Table 4.1 also summarizes the total depths measured in the pilot unit monitoring wells and piezometers on July 11, 2000 and compares these measurements with the total depths in the RI report. As shown in Table 4.1, only three monitoring wells MW-7S, MW-12S, and MW-13S, and one piezometer, P-105, display a significant difference between the measured and published total depth.

4.3.4 HYDRAULIC CONDUCTIVITY

The hydraulic conductivity values calculated from the pre-Pilot Project response tests are summarized in Table 4.2. Data summary tables, computer-generated graphs from the response test evaluation and well logs from the test monitoring wells are provided in Appendix E. The hydraulic conductivity geometric mean from the four monitoring wells tested was calculated at 1.9×10^{-3} centimeters per second (cm/sec) or 5.4 feet per day (ft/day). The pre-Pilot Project geometric mean hydraulic conductivity value is identical to the hydraulic conductivity determined during the RI for the deep wells that intersect the gravelly zone (see page 98 of the RI report).

4.4 E/R UNIT DATA

4.4.1 HYDRAULIC MONITORING

As discussed in Section 3.4.2.3 depth to water measurements were obtained and recorded daily during operation of the E/R Unit. The depth to water measurements and the surveyed top of casing elevations were used to calculate the groundwater elevations presented in Table 4.3.

4.4.2 FIELD DATA

As noted in Section 3.5, field measurements of pH, conductivity, ORP, DO, turbidity, and temperature were obtained and recorded prior to collecting groundwater samples during the Pilot Project. Table 4.4 provides a summary of the field parameters measured from the E/R Unit.

4.4.3 GROUNDWATER ANALYTICAL DATA

4.4.3.1 CONTAMINANT MASS REMOVAL PARAMETERS

The tables contained in Appendix F summarize the analytical results from the groundwater samples collected from monitoring well nests WN-1 and WN-2 and extraction wells EW-1, EW-2, and EW-3 during operation of the E/R Unit.

4.4.3.2 BROMIDE TRACER DATA

The tables presented in Appendix G summarize the bromide analytical data collected during the Phase II (tracer test) portion of the E/R Unit operation.

4.5 E UNIT DATA

4.5.1 HYDRAULIC MONITORING

As discussed in Section 3.4.3.1 depth to water measurements were measured and recorded daily during operation of the E Unit. The depth to water measurements and the surveyed top of casing elevations were used to calculate the groundwater elevations presented in Table 4.3.

4.5.2 FIELD DATA

As noted in Section 3.5 field measurements for the field parameters pH, conductivity, ORP, DO, turbidity, and temperature were obtained and recorded prior to collecting groundwater samples during the Pilot Project. Table 4.4 also provides a summary of the field parameters measured from the E Unit.

4.5.3 GROUNDWATER ANALYTICAL DATA

The tables contained in Appendix H summarize the analytical results from the groundwater samples collected from monitoring well nest WN-3 and extraction well EW-4 during the operation of the E Unit.

4.6 OTHER DATA

4.6.1 PUMPING RATES

As noted in Section 3.4.1, the flow rates at the extraction and reinjection wells were measured on a daily basis using a 1,000 ml graduated cylinder and a stopwatch. Table 4.5 summarizes the measured flow rates.

4.6.2 TAP WATER DATA

As described in Section 3.5.3, the tap water injected into the reinjection wells of the E/R Unit was analyzed three times per week for residual chlorine, pH, and dissolved oxygen. Dissolved oxygen and pH were measured by inserting direct-reading field instruments into the tap water holding tank, and residual chlorine was measured in the field using chlorine test kit. Table 4.6 provides a summary of the tap water monitoring results.

4.6.3 WEATHER CONDITIONS

A total of 4.14 inches of precipitation occurred during the operational period of the Pilot Project (October 2, 2000 – November 20, 2000). The majority of this precipitation occurred on three days, October 3, 2000 (0.84 inches), November 6, 2000 (0.92 inches),

and November 9, 2000 (1.16 inches). Weather information for the period of time during the Pilot Project is provided in Appendix I.

4.6.4 CPT DATA

The objective of the CPT, EC and UVF testing was to evaluate these technologies as screening methods to identify impacted portions of the Site or areas that have been successfully remediated without having to collected and analyze samples. Certain organic compounds that may be present in the subsurface may fluoresce in the presence of an UV light source, if present at high enough concentrations. However, results from the UVF monitoring logs yielded inconsistent meter responses. These data indicate that the contaminants present beneath the Pilot Project area do not fluoresce to UVF. Therefore, UVF does not appear to be an effective screening tool for the contaminants at the Site.

Results from the EC monitoring logs provided in Appendix J, indicate that the high chloride and ammonia concentrations present in the lower portion of the upper sand unit appears to be detectable using CPT/EC and therefore may be useful for development of a vertical profile of groundwater contamination. The CPT data summary reported prepared by Stratigraphics is provided in Appendix J.

4.6.5 GROUNDWATER AND SURFACE WATER LEVEL TRENDS

The mean daily water level of Lake Michigan during the Pilot Project is provided in Appendix K. The mean daily water level of Lake Michigan dropped by 0.6 foot to 577.0 feet during the Pilot Project.

Appendix L contains hydrographs illustrating changes in groundwater elevations in the monitoring wells, recovery wells, and extraction wells during the Pilot Project. Overall the general trend throughout most of the Pilot Project indicated a regional lowering of the water table during this period of approximately 0.6 to 1.0 foot. This general trend correlates with the decline in the water level in Lake Michigan during this same period.

Hydrographs from the monitoring wells and the reinjection wells illustrate two deviations from this general declining trend. The first deviation is noted occurred around October 4, 2000 for monitoring well nest WN-3, shortly after startup of the E Unit. A review of the precipitation data during this period indicates that 0.84 inches of

rain fell on October 3, 2000. This deviation in the downward water-level trend is believed to reflect aquifer recharge from this precipitation event.

The second deviation appears to be more significant and is noted on the hydrographs for well nest nests WN-1, WN-2, WN-3, and the reinjection wells in the E/R Unit. This deviation occurred around November 6, 2000, midway through the Phase II of the E/R Unit test. A review of the precipitation data during this period indicates that 0.92 inches and 1.16 inches of rain fell on November 6, 2000 and November 9, 2000, respectively. This second deviation from the downward water-level trend is believed to reflect aquifer recharge from these precipitation events. Shortly after the second deviation, groundwater elevations resumed the downward trend.

5.0 PILOT PROJECT DATA ASSESSMENT

5.1 OVERVIEW

During operation of the pilot units, samples were collected on a regular basis from the monitoring wells and the extraction wells for chemical analysis. Over 700 individual groundwater samples were collected and analyzed for some or all of the following parameters TCL VOCs, TCL SVOCs, general chemistry parameters (ammonia, total phenolics, nitrate, COD, cyanide, thiocyanate, alkalinity, and TSS), and bromide. Additionally, field measurements of pH, specific conductance, ORP, dissolved oxygen, temperature, turbidity, and water level were compiled at multiple locations daily during the Pilot Project and during the pre- and post-Pilot Project evaluation. As a result, a large database relating to aquifer response during operation of the pilot units was compiled during the Pilot Project.

The Pilot Project completed at the Site can be divided into three discrete studies: (1) E Unit operation, (2) E/R Unit contaminant concentration study (Phase I study), and (3) E/R Unit bromide tracer study (Phase II study). This section provides an assessment of the Pilot Project data and provides observations on system performance, aquifer response, and chemical concentration trends. This section also identifies additional data needs to scale up the system to full operation.

5.2 CONCENTRATION TRENDS IN THE PILOT UNITS

The analytical data were compiled into time versus concentration graphs for ease of data evaluation. Due to the large volume of analytical data, the number of graphs is significant. Therefore, only those plots representative of the overall data are discussed herein and are provided in Appendices M through O. However, all of the time versus concentration plots and the analytical data used to generate the plots are provided on a Compact Disk (CD), which is enclosed with this report as Appendix C. One-half the detection level was used to plot non-detect concentrations in the time versus concentration plots. Therefore, non-detect concentrations appear as non-zero concentrations in the plots.

The remainder of this subsection discusses the analytical data obtained in each of the pilot units.

5.2.1 E UNIT CONCENTRATION TRENDS

The E Unit was operated in cycles of 1 week of pumping followed by 1 week of shutdown. During each successive week of operation, the pumping rates were stepped down. The average pumping rates for the E Unit during operational weeks is summarized below:

- Week 1: 2.8 L/min;
- Week 2: Off;
- Week 3: 2.1 L/min;
- Week 4: Off;
- Week 5: 1.4 L/min;
- Week 6: Off; and
- Week 7: 0.75 L/min.

The purpose of the cyclical operation and stepping down of the pumping rates was to determine the impact of variation of groundwater extraction rates and to estimate the effects of adsorption/desorption during intermittent operation of the E Unit.

5.2.1.1 E UNIT FIELD DATA

During operation of the E Unit field data were recorded regularly including groundwater temperature, pH, specific conductivity, dissolved oxygen, redox potential, and turbidity. These data were compiled and plotted in time vs. concentration graphs, which are provided as files in the CD provided as Appendix C. Significant observations pertaining to the field data for the E Unit are summarized in this subsection.

EW-4 Extracted Water Field Data

Turbidity:	The turbidity of the extracted groundwater was low, generally 5 NTU or less.
Temperature:	The temperature of the extracted water declined steadily during the test. This temperature decline is consistent with the trend in air temperatures during the period of the study.
Extracted Water pH	No significant change in the pH of extracted water was observed during the test. Extracted water pH ranged from approximately 8.3 to 8.8.

Redox Potential: Redox potential was ranged from between -25 and 215 millivolts. No strong trends in redox potential were noted during the test.

Dissolved Oxygen: The dissolved oxygen concentration was generally low (less than 2.5 mg/L) and decreased during the test.

Conductance: The conductance of groundwater was highest at the beginning of the test (approximately 10 µmho/cm) and trended downwards during the test to approximately 2.4 µmho/cm.

Well Nest WN-3 Field Data

Turbidity: The turbidity of the groundwater was low, generally 30 NTU or less. The turbidity decreased during the test.

Temperature: The temperature of the groundwater declined steadily during the test. The groundwater temperature declined the most in monitoring well WN-3A (14.3°C to 11.3°C), in groundwater from monitoring well completed at the highest elevation in the cluster. This temperature decline is consistent with the trend in air temperatures during the period of the study.

Groundwater pH: No significant change in the pH of groundwater was observed. Groundwater pH was highest (pH between 8 and 10) in samples collected from monitoring wells screening the lower portion of the aquifer (WN-3C, WN-3D, and WN-3E) and was near neutral (pH approximately 7.0) in the A and B monitoring wells in the cluster

Redox Potential: Redox potential was generally between 35 and 300 millivolts. No strong trends in redox potential were noted during the test.

Dissolved Oxygen: The dissolved oxygen concentration was generally less than 1 mg/L and exhibited no strong concentration trends during the test.

Conductance: The conductivity of groundwater in the lower portion of the aquifer was significantly higher than the upper portion of the aquifer. Conductance in monitoring wells WN-3D and WN-3E were above 10 µmho/cm while the conductance of groundwater present at higher elevations was generally less than 5 µmho/cm.

5.2.1.2 E UNIT EXTRACTED GROUNDWATER ANALYTICAL DATA

5.2.1.2.1 GENERAL CHEMISTRY ANALYTES

The evaluation of general chemistry analytes is limited to, ammonia, total cyanide, total phenolics because these analytes have the greatest implications relative to groundwater treatment and groundwater quality. The time vs. concentration plots for ammonia, cyanide and total phenolics are provided as Graph 1 in Appendix M. Due to problems associated with accurately measuring the thiocyanate using the colorimetric method employed during the Pilot Project, these data do not provide the requisite reliability to assess concentration trends. Thiocyanate concentration graphs are provided in the files on the attached CD for completeness.

The initial concentrations of ammonia, total cyanide, and total phenolics in the extracted water sample were the highest concentrations noted during the test. The concentrations of each of these analytes decreased markedly during the first week of E Unit operation and through the first off cycle (Week No. 2). The concentrations of each of these analytes then stabilized and remained fairly steady through the remainder of the test.

As illustrated below, the final concentrations of each of these analytes in E Unit extracted water was significantly lower at the end of the test than the beginning of the test.

Analyte	*Start Concentration*	*Start Concentration Second Week*	*End Test Concentration*
Ammonia (mg/L)	1,100	280	280
Total Cyanide (µg/L)	290	18	83
Total Phenolics (mg/L)	1,000	33	29

The initial large decrease in the concentrations of these analytes was observed in extracted groundwater samples from EW-4 during the first operational period when groundwater extraction was at its highest rate (averaging approximately 2.8 L/min). Analyte concentrations stabilized by the second operational week and remained level through the remainder of the test.

Groundwater contamination in the Pilot Project area is stratified with the most elevated concentrations of analytes present in the lowest 5 feet of the shallow aquifer. (This observation is consistent with the Site-wide analytical data compiled during the RI.) Since the extraction wells screen the lower 5 feet of the aquifer where groundwater

contaminant concentrations are most elevated, the initial groundwater extracted would be obtained from the zone around the well screen (the lower portion of the aquifer) where the highest concentrations of contaminants are present. As such, the concentrations of contaminants would be highest in extracted groundwater obtained near startup. However, as the test progressed and groundwater flow patterns equilibrated with the pumping rate, cleaner groundwater was drawn from higher elevations in the aquifer and mixed with the groundwater from the lowest portion of the aquifer, reducing the concentrations of analytes in the extracted water. Therefore, initial decrease in concentrations in the extracted water samples collected during the first operational week are attributable to vertical (downward) flow of less contaminated groundwater from the higher elevations.

This "drawdown effect" (vertical groundwater flow due to establishment of vertical gradients during pumping) is commonly observed in partially penetrating wells. In this Pilot Project, the scale of the pilot test in effect provides an effectively unlimited contaminant source. Therefore, downward concentration trends in extracted water in the E Unit would not be attributable to an improvement in groundwater quality as a result of pumping. Rather, the drawdown effect causes downward flow of cleaner groundwater from higher elevations in the shallow aquifer depressing contaminant concentrations in extracted groundwater.

Evidence of the drawdown effect is demonstrated through an examination of the hydraulic head data for well nest WN-3 (see Table 4.3). Evaluation of the hydraulic head data for well nest WN-3 indicates that a downward vertical gradient was established during the Pilot Project. Prior to the start of the E Unit test on October 2, 2000, the groundwater elevations measured in each of the monitoring wells in well nest WN-3 were equivalent (581.71), indicating no vertical gradient was present in the upper sand aquifer. However, following the startup of pumping at extraction well EW-4, a downward vertical gradient was established. The most significant vertical gradient developed between monitoring well WN-3A to monitoring well WN-3D. During the period from October 3 to October 8, 2000, the difference in the hydraulic head measured between monitoring well WN-3A and WN-3D ranged from 0.2 feet to 0.27 feet, with the highest water level consistently measured at monitoring well WN-3A and the lowest water level consistently measured at monitoring well WN-3D. In general, the downward vertical gradient was greatest when the pumping rates were highest and were negligible by the time the pumping was set at the lowest level. The hydraulic head data indicate a downward component of groundwater flow at well nest WN-3, particularly during the periods when the groundwater pumping rates were highest.

A slight rise in the concentration of ammonia was noted between the end of the second week and the start of the third week of operation, and the end of the third week and start of the fourth week of operation. Similarly, slight increases in the concentrations of total cyanide and total phenolics were noted between the end of the third operational week and the beginning of the fourth operational week. The increase in concentration was most significant for total cyanide between the end of the third operational week and the beginning of the fourth operational week. During this period, the total cyanide concentration recovered to nearly 50 percent of the concentration observed at startup. However, it should be noted that total cyanide started at a very low concentration relative to the other analytes and remained low throughout the test.

The increases in concentrations noted in extracted water during the latter portion of the test is most likely related to a decrease in the amount of vertical flow during the test rather than adsorption/desorption effects. During the E Unit test, the pumping rates were stepped down during each successive week of operation (2.8, 2.1, 1.4, and 0.75 L/min). As the pumping rates were decreased during the test, a lower proportion of the cleaner groundwater from higher elevations in the aquifer would be drawn into the extraction well. This would result in an increase in the concentrations of contaminants in the extracted water as the pumping rates were stepped down. This is the trend observed for ammonia, total cyanide, and total phenolics during the E Unit test.

5.2.1.2.2 SEMIVOLATILE ORGANIC COMPOUNDS

Four SVOCs were detected on a consistent basis during the Pilot Project (phenol, 2-methylphenol, 4-methylphenol, and 2,4-dimethylphenol). The time vs. concentration plot for these SVOCs is provided in Graph 2 in Appendix M. Similar to the trends noted for ammonia, total cyanide, and total phenolics, the concentrations of each of these analytes decreased markedly during the first operational period. The concentrations of each of these analytes then stabilized and remained steady through the remainder of the test.

As illustrated below, the final concentrations of the SVOCs in E Unit extracted water was significantly lower at the end of the test than the beginning of the test.

Analyte	*Maximum Concentration*	*Concentration End of Second Week*	*End Test Concentration*
Phenol (mg/L)	140	4.0	7.7
2-Methylphenol (mg/L)	31	1.9	2.8
4-Methylphenol (mg/L)	95	4.8	5.9
2,4-Dimethylphenol (mg/L)	11	1.6	2.2

The SVOC concentrations in extracted groundwater displayed the same response to the drawdown effect that observed for the general chemistry analytes. There was no trend of increasing SVOC concentrations in extracted water following the shutdown weeks.

5.2.1.2.3 VOLATILE ORGANIC COMPOUNDS

The VOCs detected regularly during the Pilot Project included acetone, benzene, 2-butanone, ethylbenzene, styrene, toluene, and total xylenes. In the E Unit extracted water, the VOCs detected at the highest concentrations were benzene, toluene, and acetone. The time vs. concentration plot for benzene, toluene, and acetone is provided in Graph 3 in Appendix M.

The VOC concentrations in extracted groundwater displayed the same response to the drawdown effect as that observed for the general chemistry analytes and SVOCs. The concentrations of benzene, toluene, and acetone in extracted groundwater decreased sharply during the first week of operation. The concentrations of benzene and toluene leveled off during the third operational period to approximately 200 µg/l and 120 µg/l, respectively. The concentration of acetone reached the non-detect level during the second operational period and remained near this level to the end of the test. The

concentrations of ethylbenzene, styrene, and total xylenes were below the Illinois Class I groundwater quality objectives and the maximum contaminant levels (MCLs) throughout the test. There are no groundwater quality objectives established for 2-butanone.

There was no trend of increasing VOC concentrations in extracted water following the shutdown weeks.

5.2.1.2.4 TOTAL ARSENIC

The total arsenic time vs. concentration plot is provided as Graph 4 in Appendix M. As illustrated in this plot, the total arsenic concentration was highest at the start of the test (2.9 mg/L) and was lowest at the start of the fourth week of operation (0.670 mg/L). The largest decrease in total arsenic concentration in extracted water occurred during the first two operational weeks when the total arsenic concentration decreased from 2.9 mg/L to 0.84 mg/L. As noted for the previous analytes, the large drop in total arsenic concentrations during the first two operational periods is attributed to the drawdown effect. There was no demonstrable effect as a result of cyclical operation of the E Unit.

5.2.1.3 GROUNDWATER ANALYTICAL DATA - WELL NEST WN-3

This subsection summarizes the groundwater analytical data obtained from groundwater samples collected from the E Unit monitoring wells in well nest WN-3. Groundwater analytical data from samples collected from these monitoring wells are summarized in the graphs provided in Appendix M. Groundwater samples were collected prior to startup of extraction well EW-4 (pre-extraction samples), during operation of the extraction well, and approximately one and four weeks following final shutdown of extraction well EW-4 (post-extraction samples). The pre-extraction groundwater samples were collected from well nest WN-3 on October 2, 2000, prior to startup of the E Unit. Post-extraction groundwater samples were collected from well nest WN-3 on November 27, 2000 and December 18, 2000, one week and four weeks following shutdown of the E Unit. Groundwater samples collected between initial startup on October 2, 2000 and final shutdown on November 20, 2000 were collected when the extraction well was operating.

The operational schedule of the E Unit is summarized below:

Date	*Time*	*Action*
10/02/00	1111 to 1256	Pre-Extraction Monitoring
10/02/00	1323	Begin Test, Pump On
10/09/00	0835	Pump Off
	October 9-16, 2000 -- E Unit Off	
10/16/00	1026	Pump On
10/23/00	1100	Pump Off
	October 23-30, 2000 -- E Unit Off	
10/30/00	0840	Pump On
11/06/00	0820	Pump Off
	November 6-13, 2000 - E Unit Off	
11/13/00	0840	Pump On
11/20/00	1015	Test Complete, Pump Off
11/27/00	0902 to 1026	Post-Extraction Monitoring
12/18/00	01235 to 1344	Post-Extraction Monitoring

The remainder of this subsection provides a discussion of the analytical data obtained from the E Unit by analyte group.

5.2.1.3.1 GENERAL CHEMISTRY ANALYTES

Similar to the extracted water data for the E Unit, the concentration trend discussion will be limited to ammonia, total phenolics, and total cyanide, the general chemistry analytes with greatest implications related to groundwater treatment and groundwater quality. Graphs of concentrations vs. time for each analyte and at each monitoring well in well nest WN-3 were evaluated to provide an understanding of the vertical distribution of analytes during the E Unit test and the effects of groundwater extraction vertically in the aquifer over time.

The stratified distribution of contaminants at the Site is illustrated by the ammonia concentrations at WN-3. The initial ammonia concentrations were highest in the groundwater samples collected from the deepest monitoring well (WN-3E) and were progressively lower in groundwater samples collected from the wells screened at higher elevations. The ammonia concentration measured at the start of the test was 1,600 mg/L in the groundwater sample collected from WN-3E and 33 mg/L in the groundwater sample collected from WN-3A.

Ammonia concentrations vs. time in the groundwater samples collected from WN-3 monitoring wells are illustrated in Graph 5 in Appendix M. The ammonia concentrations at the beginning and end of the test are not significantly different in the groundwater samples collected from monitoring wells WN-3D and WN-3E. There is considerable analytical variability in the groundwater samples collected over time from monitoring wells WN-3D, WN-3E, and to a more limited extent, WN-3C. However, slight downward concentration trends are noted in the ammonia results for groundwater samples collected from monitoring wells WN-3A, WN-3B and WN-3C.

Total cyanide concentrations vs. time in the groundwater samples collected from monitoring wells in well nest WN-3 are illustrated in Graph 6 in Appendix M. The initial total cyanide concentrations were highest in the groundwater samples collected from the deepest monitoring well (WN-3E) and were progressively lower in groundwater samples collected from the wells screened at higher elevations. The total cyanide concentration measured at the start of the test was 0.890 mg/L in the groundwater sample collected from WN-3E and 0.055 mg/L in the groundwater sample collected from WN-3A. The total cyanide concentrations at the beginning and end of the test are not significantly different at any of the well nest WN-3 monitoring wells.

Total phenolics concentrations vs. time in the groundwater samples collected from well nest WN-3 monitoring wells are illustrated in Graph 7 in Appendix M. The concentration of total phenolics in groundwater samples collected from every monitoring well in well nest WN-3, except WN-3D, fell markedly from the first groundwater sample to the second groundwater sample collected during the first operational period. The drop in concentrations is most pronounced in the groundwater samples collected from monitoring wells WN-3B, WN-3C, and WN-3E where the difference in concentration between the first sample and the second sample collected is 2,000 mg/L or greater. The large drop in total phenolics concentrations is not easily explained by aquifer hydraulics, particularly when other contaminants monitored at well nest WN-3 and all the monitoring wells in the cluster do not display a similar concentration trend. This trend is more likely the result of analytical and/or field factors that may have resulted in exaggerated initial concentrations of this analyte.

The total phenolics concentrations at the beginning and end of the test, ignoring the initial drop in concentration, are not significantly different at any of the well nest WN-3 monitoring wells. The concentration of total phenolics in groundwater samples collected during the post-extraction period (1 and 4 weeks following E Unit shutdown) did not exhibit rebound and there was no rebound of total phenolics concentrations following the shutdown periods.

Well nest WN-3 is located approximately 5 feet from the extraction well in the E Unit. The general chemistry analytical data from well nest WN-3 demonstrate that groundwater extraction had little effect on the concentrations of these analytes in the aquifer. Additionally, there was no effect that resulted from variation of the pumping rates.

5.2.1.3.2 SEMIVOLATILE ORGANIC COMPOUNDS

Four SVOCs were detected regularly during the Pilot Project (phenol, 2-methylphenol, 4-methylphenol, and 2,4-dimethylphenol). The SVOC concentration trends noted in groundwater samples collected from well nest WN-3 during the Pilot Project are comparable from one SVOC to another (i.e., the concentration trend for phenol is comparable to concentration trends for 2-methylphenol, 4-methylphenol, and 2,4-dimethylphenol). Therefore, the concentration trends for phenol will be discussed in detail herein and the conclusions derived from the evaluation are applicable to the other SVOCs detected regularly during E Unit operation.

The concentration of phenol, as well as the other SVOCs, is highly stratified in the aquifer with large variation in concentration noted over a relatively small vertical distance. The concentration of SVOCs in the first groundwater samples collected from the deepest monitoring well (WN-3E) is over one hundred time higher than the concentrations observed in the first groundwater samples collected from the shallowest monitoring well (WN-3A).

The concentration of phenol in the first groundwater samples collected from well nest WN-3 is summarized in the table provided below illustrate the concentration gradient with depth.

Well Identifier	*Phenol Concentration in First Sample (mg/L)*
WN-3A	0.18
WN-3B	8.0
WN-3C	76
WN-3D	280
WN-3E	435

As illustrated by the preceding table, the most elevated concentrations of phenol are present in the lowermost portion of the aquifer. The concentrations of phenol decrease

by a factor of approximately 10 in the first groundwater samples collected from each monitoring well screened above WN-3D.

As illustrated in Graph 8 and 9 in Appendix M, the concentration of phenol remained relatively stable in the groundwater samples collected from monitoring wells WN-3D and WN-3E but decreased during the first week of operation in the groundwater samples collected from monitoring wells WN-3A, WN-3B, and WN-3C. The phenol concentrations in groundwater samples collected from WN-3A were non-detect beginning with the sample collected during the third operational period, through the end of the post-extraction groundwater sampling. The phenol concentration in groundwater samples collected from WN-3B were non-detect beginning with the groundwater sample collected during the final operational period and remained non-detect through the post-study period. The decrease in SVOC concentrations is attributed to the drawdown effect discussed in Section 5.2.1.2.1. As discussed previously, the drawdown effect would result in downward analyte concentration trends over time as cleaner groundwater from higher elevations in the shallow aquifer flowed into the more contaminated zones. The effect would be most pronounced in the wells (the "A" and "B" wells) that screen the higher elevations where the lowest starting contaminant concentrations were observed. The effect is less pronounced in groundwater samples collected from the "C" elevation monitoring wells and is negligible or absent in groundwater samples collected from the "D" and "E" elevation monitoring wells where the most elevated contaminant concentrations are present.

After the first operational week, there were no rebound effects noted between groundwater samples collected during each successive week of operation. In general, there was no significant rebound of contaminant concentrations during the post-extraction period. This indicates that cyclical operation of the system has no notable effect on contaminant concentrations. However, a trend of slightly increasing concentrations is noted in the groundwater samples collected from monitoring well WN-3C during the post-extraction period. This slight increase in the concentrations is also noted in the groundwater samples collected from monitoring well WN-3C for the other SVOCs. This slight rebound in concentration at WN-3C is most likely due to elimination of vertical flow and the proximity of this elevation to the more highly contaminated zone at the slightly lower elevations.

5.2.1.3.3 VOLATILE ORGANIC COMPOUNDS

VOCs detected regularly during the Pilot Project included acetone, benzene, 2-butanone, ethylbenzene, styrene, toluene, and total xylenes. Acetone and benzene were the VOCs

that exhibited the highest concentrations during the test followed by toluene, total xylenes, 2-butanone, styrene, and ethylbenzene. Time vs. concentration plots for acetone, benzene, and toluene are provided in Graphs 10 through 12 in Appendix M. In general, the concentration trends noted in groundwater samples collected from well nest WN-3 during the Pilot Project are comparable for each of the VOCs. The observed concentrations of VOCs in groundwater samples collected from well nest WN-3 monitoring wells were much lower relative to the observed concentrations of the SVOCs in groundwater samples collected from these same locations.

The concentrations of VOCs exhibited similar concentration trends as the SVOCs. There were downward concentration trends observed during the first operational period. Except for benzene, a sharp spike in the concentrations of all VOCs was noted in the groundwater samples collected from monitoring wells WN-3D and WN-3E on October 19, 2000 during the second operational week. However, the VOC concentrations during the third operational week were comparable to the concentrations observed during the first operational week. With the exception of the spike in concentrations during the second operational week, there were no notable VOC concentration trends between operational weeks. Additionally, there was no notable rebound in VOC concentrations during the one-month post-extraction period.

5.2.1.3.4 TOTAL ARSENIC

A time vs. concentration plot for total arsenic analytical data for groundwater samples collected from well nest WN-3 is provided as Graph 13 in Appendix M. The total arsenic concentrations were higher by a factor of approximately four in the groundwater samples collected from monitoring well WN-3E as compared to the groundwater samples collected from the other monitoring wells in the cluster. The total arsenic concentrations were lower in the groundwater samples collected from the monitoring wells screened highest in the aquifer (WN-3A, WN-3B, and WN-3C).

In general, the concentrations of total arsenic in groundwater samples collected from monitoring wells WN-3A and WN-3E did not exhibit any significant concentration trends during extraction or during the post-extraction period. There was significant variability in the total arsenic data at these locations. The concentrations of total arsenic in groundwater samples collected from monitoring wells WN-3B, WN-3C, and WN-3D exhibited limited downward trends.

5.2.2 E/R UNIT CONTAMINANT TRENDS

The E/R Unit was operated continuously for 6 weeks, except for a one-day shutdown during changeover from Phase I to Phase II. During this time, groundwater was extracted from the three central extraction wells and tap water was injected at the six outer reinjection wells. The E/R Unit was operated in two phases. During Phase I, groundwater was extracted from the three center extraction wells at a combined rate of approximately 3 L/min while tap water was injected at the east and west bank of reinjection wells at a combined rate of approximately 1.5 L/min in each bank. This extraction/reinjection configuration resulted in groundwater extraction and reinjection occurring at approximately equal rates in the E/R Unit. This Phase I extraction/reinjection configuration is known as the "balanced flows" phase. It is during Phase I where contaminant mass removal was evaluated.

During Phase II of E/R Unit operation, the injection rates at the reinjection wells were adjusted to maximize the recovery of the bromide tracer, which was injected at the start of Phase II. Based on groundwater particle tracking modeling, it was determined that optimal recovery of the bromide tracer would be achieved by "unbalancing" the tap water injection rates between the east and west bank of reinjection wells. Therefore, during Phase II of E/R Unit operation, the injection rates at each well of the east bank of reinjection wells was set at approximately 0.9 L/min (total approximately 2.7 L/min) and the injection rates at each well of the west bank of reinjection wells was set at approximately 0.2 L/min (total approximately 0.6 L/min). During Phase II, groundwater was extracted from the center extraction wells at a combined rate of approximately 3 L/min. This Phase II extraction/reinjection configuration is known as the "unbalanced flows" phase.

5.2.2.1 E/R UNIT FIELD DATA

During operation of the E/R Unit field data were recorded regularly including groundwater temperature, pH, specific conductivity, dissolved oxygen, redox potential, and turbidity. These data were compiled and plotted in time vs. concentration graphs, which are provided as files in the CD provided as Appendix C. Significant observations pertaining to the field data for the E/R Unit are summarized in this subsection.

EW-1, EW-2 and EW-3 Extracted Water Field Data

Turbidity:	The turbidity of the extracted groundwater was low (generally less than 15 NTU). No significant trends in turbidity were noted during the test.
Temperature:	The temperature of the extracted water rose during Phase I and declined steadily during Phase II.
Extracted water pH:	No significant change in the pH of extracted water was observed. Extracted water pH was generally between 8.5 and 9.0 during the test.
Redox Potential:	Redox potential was generally between approximately -30 and 300 millivolts. The redox potential generally trended downward during operation of the E/R Unit.
Dissolved Oxygen:	The dissolved oxygen concentration was generally very low (less than 0.7 mg/L) and exhibited no strong concentration trends during the test.
Conductance:	The conductivity of extracted water decreased steadily and significantly during operation of the E/R Unit. Extracted water from EW-1 decreased the most rapidly (to less than 1 μmho/cm).

Well Nest WN-1 Field Data

Turbidity:	The turbidity of the groundwater was low, generally 20 NTU or less. No significant trends in turbidity were noted.
Temperature:	The temperature of the groundwater rose during slightly Phase I then declined steadily during Phase II.
Groundwater pH:	No significant change in the pH of groundwater was observed. Groundwater pH was highest (pH between 8 and 9.4) in samples collected from monitoring wells screening the lower portion of the aquifer (WN-3C, WN-3D, and WN-3E) and was near neutral (pH = 7.0) in the A and B monitoring wells in the cluster
Redox Potential:	Redox potential was generally between 0 and 300 millivolts. There was significant variability in the data but no strong trends in redox potential were noted during the test.
Dissolved Oxygen:	The dissolved oxygen concentration was generally very low (less than 1 mg/L) and exhibited a slight downward concentration trend during the test.
Conductance:	The conductivity of groundwater in the lower portion of the aquifer was significantly higher than the upper portion of the aquifer. Conductance in monitoring wells WN-1D and WN-1E

was above 10 µmho/cm while the conductance of groundwater present at higher elevations was less than 5 µmho/cm. The conductivity of the groundwater decreased steadily and significantly in monitoring wells WN-1D and WN-1E during operation of the E/R Unit to less than 2 µmho/cm.

Well Nest WN-2 Field Data

With the exception of conductance, the field data for WN-2 was comparable to WN-1. However, following an initial significant decrease in value during Phase I, the conductance of the groundwater collected from monitoring well WN-2E rose steadily during Phase II. This trend is noted in the analytical data from WN-2E during Phase II and is believed to be attributable to the change in E/R Unit operation during Phase II. This is discussed in more detail in a later subsection.

5.2.2.2 E/R UNIT EXTRACTED GROUNDWATER ANALYTICAL DATA

As stated previously, groundwater was extracted from three center extraction wells during the E/R Unit test. Extracted water samples were collected from each of the extraction wells during E/R Unit operation. However, it is the extracted water analytical data from the central extraction well, EW-1, which is most representative of parameter concentration trends within a groundwater remediation cell. This is because the central extraction well is hydraulically isolated from the exterior of the E/R Unit by reinjection wells and extraction wells, which surround the central extraction well.

The two other extraction wells in the E/R Unit, EW-2 and EW-3, operate on the exterior of the unit. As such, the outer extraction wells will draw groundwater from the exterior of the E/R Unit. The initial extracted water samples collected from the two outer extraction wells would be representative of aquifer conditions. However, as the test proceeds, a mixture of reinjected tap water from the reinjection wells and groundwater drawn from outside the E/R Unit will result in contaminant concentrations that are not representative of cell performance. While the extracted water analytical data from the outer extraction wells is important to consider during scale up to the full-size system for the purpose of designing wastewater treatment systems, these data are not as useful in evaluating cell performance. Consequently, it is the extracted water data from EW-1 that will primarily be used to evaluate E/R Unit performance.

5.2.2.2.1 GENERAL CHEMISTRY ANALYTES

The time vs. concentration plot for ammonia, cyanide and total phenolics is provided in Graph 1 in Appendix N. The initial concentrations of ammonia and total phenolics in the extracted water sample were approximately 2,000 mg/L. The maximum concentration of total cyanide was observed approximately two days into the test when it reached 0.750 mg/L. The concentrations of each of these analytes decreased substantially during the first week of E/R Unit operation. By the end of Phase I, the concentrations of ammonia, total cyanide and total phenolics were near the lowest levels of the test as illustrated below.

Analyte	*Highest Concentration*	*End Phase I Concentration*	*End Phase II Concentration*
Ammonia (mg/L)	2,000	160	65
Total Cyanide (µg/L)	750	16J	ND(10)
Total Phenolics (mg/L)	2,000	36	11

The general chemistry concentrations in the first sample of EW-1 extracted water are twice as high as the concentrations of these same analytes in the first sample of extracted water from the E Unit. However, the general chemistry analyte concentrations in EW-1 extracted water at the end of Phase I were lower than the concentration observed at the conclusion of the E Unit test. The general chemistry concentrations in EW-1 extracted water at the conclusion of Phase II were 3 to 16 times lower than the extracted water concentrations at the conclusion of the E Unit test.

The similar concentration trends observed in extracted water analytical data during the first week of the E and E/R Unit tests suggest that the drawdown effect is the primary mechanism responsible for the downward concentration trends at during the early portion of the test. However, although the drop in contaminant concentrations during the early portion of the test is attributable to the extraction effect, based upon the much higher initial contaminant concentrations and the lower final contaminant concentrations, the E/R Unit is more efficient at reducing the contaminant concentrations in the aquifer. This effect is attributable to the injection of water at the reinjection wells (reinjection effect). The reinjection effect resulted in a large and sustained decrease in analyte concentrations in extracted groundwater from the E/R Unit as this reinjected water was flushed into the test cell as the Pilot Project progressed. The flushing effect resulted in lower contaminant concentrations inside the E/R Unit below the level attained by the E Unit where an effectively unlimited contaminant source was present.

5.2.2.2.2 SEMIVOLATILE ORGANIC COMPOUNDS

There were four SVOCs detected regularly during the Pilot Project (phenol, 2-methylphenol, 4-methylphenol, and 2,4-dimethylphenol). The time vs. concentration plot for these SVOCs is provided in Graph 2 of Appendix N.

As illustrated below, the final concentrations of the SVOCs in EW-1 extracted water was significantly lower at the end of the test than the beginning of the test.

Analyte	*Highest Concentration*	*End Phase I Concentration*	*End Phase II Concentration*
Phenol (mg/L)	360	14	2.8
2-Methylphenol (mg/L)	73	5.2	0.950
4-Methylphenol (mg/L)	260	16	2.6
2,4-Dimethylphenol (mg/L)	25	2.3	0.610

The SVOC concentrations in the first sample collected of EW-1 extracted water are 3 to 4 times higher than the concentrations of these same analytes in the first sample of extracted water from the E Unit. However, the SVOC concentrations in EW-1 extracted water at the end of Phase I were lower than the concentration observed at the conclusion of the E Unit test. The SVOC concentrations in EW-1 extracted water at the conclusion of Phase II were 1.5 to 3 times lower than the extracted water concentrations at the conclusion of the E Unit test.

Again, these data suggest that drawdown effect is the primary mechanism responsible for the downward concentration trends at during the early portion of the test. However, based upon the much higher starting concentrations and the lower final concentrations, the E/R Unit, the reinjection effect results in greater efficiency in reducing the contaminant concentrations in the E/R Unit. The reinjection effect maintains these lower concentrations throughout the test.

5.2.2.2.3 VOLATILE ORGANIC COMPOUNDS

In the E/R Unit extracted water, the VOCs detected at the highest concentrations included benzene, toluene, and acetone. The time vs. concentration plot for VOC in EW-1 extracted water is provided in Graph 3 of Appendix N. The concentrations of benzene, toluene, and acetone (the three VOCs detected at the highest initial concentrations) in extracted groundwater decreased rapidly Phase I. The bulk of the

concentration drop observed for the VOCs occurred during Phase I and during the first week of Phase II.

As illustrated in the table below, overall, VOC concentrations were significantly lower in E/R Unit extracted water than in E Unit extracted water at the conclusion of the Pilot Project.

Analyte	*Start Concentration E Unit*	*Start Concentration E/R Unit*	*End Concentration E Unit*	*End Concentration E/R Unit*
Benzene (µg/L)	750	900	200	61
Toluene (µg/L)	340	310	120	39
Acetone (µg/L)	130	370	ND(53)U	6.9

Based upon the similar or higher starting VOC concentrations and the lower final VOC concentrations, the E/R Unit is more efficient at reducing the contaminant concentrations in the aquifer.

5.2.2.2.4 TOTAL ARSENIC

The total arsenic time vs. concentration plot for EW-1 extracted water is provided as Graph 4 in Appendix N. As illustrated in this plot, the total arsenic concentration at the start of the test was between 9 and 13 mg/L. The maximum arsenic concentration observed during the test was 14 mg/L in an extracted water sample collected from EW-1 during the early part of the Phase I test. In general, the maximum starting concentration of arsenic observed in E/R Unit extracted water samples (14 mg/L) was much higher than the maximum arsenic concentration observed in E Unit extracted water samples (2.9 mg/L).

In spite of the fact that total arsenic concentrations in the E/R Unit were 5 times higher than the total arsenic concentrations in the E Unit, the arsenic concentrations in extracted groundwater samples at the conclusion of the Pilot Project were similar in the E and E/R Units, as illustrated in the table below.

Test Unit	*Maximum Arsenic Concentration (mg/L)*	*Final Arsenic Concentration (mg/L)*
E Unit (EW-4)	2.9	0.680
E/R Unit (EW-1)	14	0.730

Approximately 95 percent of the reduction in arsenic concentration in EW-1 extracted water occurred during the 2-week period from October 14 through 28, 2000. The reduction in arsenic concentration in extracted water leveled off during the Phase II portion of the test.

Based upon the much higher starting total arsenic concentrations and the comparable final total arsenic concentrations, the E/R Unit is more efficient at reducing the contaminant concentrations in the aquifer as compared to the E Unit.

5.2.2.2.5 OTHER E/R UNIT EXTRACTED WATER DATA

As discussed earlier in this section, extracted water data from the outer extraction wells (EW-2 and EW-3) are not as useful in evaluating cell performance due to mixing of water from outside the test unit. Nonetheless, the extracted water analytical data from the outer extraction wells are important to consider during scale up to the full-size system for designing wastewater treatment systems. Therefore, for the sake of completeness and potential use during future work, files containing extracted water data and graphs for extraction wells EW-2 and EW-3 are included in the CD attached to this report.

5.2.2.3 GROUNDWATER ANALYTICAL DATA - E/R UNIT

This subsection summarizes the groundwater analytical data obtained from groundwater samples collected from the E/R Unit monitoring wells in well nests WN-1 and WN-2. Groundwater analytical data from samples collected from these monitoring wells are summarized in the graphs provided in Appendix N. Groundwater samples were collected prior to startup of the E/R Unit extraction wells (pre-extraction samples), during operation of the extraction well, and approximately one and four weeks following final shutdown of the E/R Unit extraction wells (post-extraction samples). The pre-extraction groundwater samples were collected from well nests WN-1 and WN-2 on October 9, 2000. Post-extraction groundwater samples were collected from well nests WN-1 and WN-2 on November 27, 2000 and December 18, 2000. Post-extraction groundwater samples collected from the E/R Unit were analyzed for TCL VOCs, TCL SVOCs, total cyanide, thiocyanate, total phenolics, ammonia, and total arsenic.

The remainder of this subsection provides a discussion of the analytical data obtained from the E/R Unit by analyte group.

5.2.2.3.1 WELL NEST WN-1 ANALYTICAL DATA

Well nest WN-1 is located along the middle of the east-west axis of the E/R Unit, approximately halfway between the middle reinjection well in the western row of extraction wells (RW-2) and the central extraction well (EW-1). As discussed in Section 3.0, five monitoring wells were constructed in each of the well nests to monitor groundwater quality at different elevations in the aquifer (see Figure 3.1). Due to its location along the centerline of the E/R Unit, the analytical data from well nest WN-1 are most representative of contaminant concentration trends within the E/R Unit groundwater remediation test cell. This is because the well nest WN-1 is hydraulically isolated from the exterior of the E/R Unit.

GENERAL CHEMISTRY ANALYTES

Similar to the extracted water data for the E Unit, the concentration trend discussion will be limited to ammonia, total phenolics, and total cyanide, the general chemistry analytes with greatest implications related to groundwater treatment and groundwater quality.

The stratified distribution of contaminants at the Site is illustrated by the general chemistry data for groundwater samples collected from WN-1. The initial concentrations of the general chemistry analytes were highest in the groundwater samples collected from the deepest monitoring well (WN-1E) and were progressively lower in groundwater samples collected from the wells screened at higher elevations. For example, the ammonia concentration measured at the start of the test was 1,700 mg/L in the groundwater sample collected from WN-1E and 83 mg/L in the groundwater sample collected from WN-1A. Ammonia, total cyanide and total phenolics concentrations vs. time in the groundwater samples collected from monitoring wells in well nest WN-1 are illustrated in Graphs 5 thorough 7 in Appendix N.

The general chemistry concentration trends are illustrated by the analytical data for monitoring well WN-1E summarized in the table below.

Analyte	*Maximum Concentration*	*Concentration End of Phase I*	*Post-extraction Concentration*
Ammonia (mg/L)	2,400	61	74
Total Cyanide (mg/L)	1.7	ND(0.01)	0.059
Total Phenolics (mg/L)	2,000	19	38

As illustrated above, the maximum concentrations of general chemistry analytes were reduced by factors of between 20 and 50 times during E/R Unit operation. All of the reduction in contaminant concentration occurred before the end of Phase I. In general, concentrations began falling first in groundwater samples collected from monitoring well WN-1E, followed by monitoring well WN-1D, then WN-1C. The reductions in contaminant concentrations were most dramatic in the well screened in the lowermost portions of the aquifer where the most contaminant mass is present. There was no significant recovery of general chemistry analyte concentrations during the post-extraction period.

These general chemistry concentration trend data suggest that the injected water front first passed through the deepest portion of the aquifer. However, significant reductions in general chemistry analyte concentrations were noted in groundwater samples collected from monitoring well WN-1A. Hydraulic head data summarized in Table 4.3 demonstrate that, similar to that noted at monitoring well nest WN-3 in the E Unit, a vertical gradient developed at well nest WN-1 following startup and this vertical gradient persisted throughout the test. This suggests that the drawdown effect observed in the E Unit was also present in the E/R Unit and was the cause of the reduction in contaminant concentrations observed at higher elevations in the aquifer. However, in contrast to the general chemistry analytical data for the well nest WN-3, the general chemistry analytical data for the deeper monitoring wells in well nest WN-1 also exhibited significant downward concentration trends during Phase I of E/R Unit operation. The data demonstrate that the reinjection effect was more efficient at lowering the contaminant concentrations throughout the test cell.

SEMIVOLATILE ORGANIC COMPOUNDS

The SVOC concentration trends noted in groundwater samples collected from well nest WN-1 during the Pilot Project are similar from one analyte to another (i.e., the concentration trend for phenol is comparable to concentration trends for 2-methylphenol, 4-methylphenol, and 2,4-dimethylphenol). Plots depicting the phenol concentrations vs. time at well nest WN-1 are provided in Graphs 8 and 9 in Appendix N. Similar concentration trends were observed for the other SVOCs. Files containing concentration graphs for all SVOCs are provided on the CD attached to this report.

Phenol concentrations, as well as the concentrations of the other SVOCs, are highly stratified. As illustrated by the table below, the most elevated concentration of phenol, thus the greatest contaminant mass, is present in the lowermost portion of the aquifer.

Well Identifier	*Maximum Phenol Concentration (mg/L)*
WN-1A	1.5
WN-1B	12
WN-1C	55
WN-1D	300
WN-1E	370

The maximum concentrations of SVOCs are noted just after startup of the E/R Unit but the concentrations dropped steeply a few days into the test. Similar to the observations noted in the previous subsection for the general chemistry analytes, the SVOC analytical data for well nest WN-1 exhibit significant downward concentration trends during Phase I of E/R Unit operation. The most significant downward concentration trends were noted in the monitoring wells screened near the base of the aquifer and are attributed to the reinjection effect. However, downward concentration trends were also noted for monitoring wells WN-1A and WN-1B screened at higher elevations and the downward concentration trends in the groundwater samples collected from monitoring wells screened at higher elevations are attributed to the drawdown effect.

Relative to the maximum concentrations of SVOCs observed during the test, there was no significant rebound of contaminant concentrations during the post-extraction period. Slight increases in the concentrations of SVOCs were noted during the post-extraction period in the groundwater samples collected from monitoring wells WN-1C and WN-1E. However, the observed increases in concentrations during the post-extraction period were not significant, generally amounting to one percent or less of the total decrease in SVOC concentrations observed during the test.

VOLATILE ORGANIC COMPOUNDS

VOCs detected regularly during the Pilot Project included acetone, benzene, 2-butanone, ethylbenzene, styrene, toluene, and total xylenes. Time vs. concentration plots for the VOCs detected at the highest concentrations (benzene, acetone, and toluene) are provided as Graphs 10 through 12 in Appendix N. In general, the concentration trends noted in groundwater samples collected from well nest WN-1 during the Pilot Project are comparable for each of the VOCs. Benzene exhibited the highest concentrations

during the test followed by acetone, toluene, total xylenes, 2-butanone, styrene, and ethylbenzene.

Similar to the other analytes discussed, the VOC analytical data exhibited significant downward concentration trends during Phase I of E/R Unit operation. The maximum concentrations of VOCs were noted just after startup of the E/R Unit and the concentrations drop steeply a few days into the test. VOC concentrations reach their test lows near the end of Phase I or during the first week of Phase II. VOC concentrations remained low and did not exhibit significant rebound during the post-extraction period.

The VOC analytical data for well nest WN-1 exhibited significant downward concentration trends during Phase I of E/R Unit operation. The reduction in concentration over time was most pronounced in the groundwater samples collected from monitoring wells WN-1D and WN-1E and is attributable to the reinjection effect. However, a significant reduction in VOC concentrations was noted in groundwater samples collected from monitoring wells screened at higher elevations, which is attributable to the drawdown effect.

TOTAL ARSENIC

The total arsenic time vs. concentration plot for well nest WN-1 groundwater samples is provided as Graph 13 in Appendix N. The total arsenic analytical data exhibited significant downward concentration trends during Phase I of E/R Unit operation. The maximum concentration of total arsenic was noted a few days following startup of the E/R Unit and the concentrations dropped steeply during the first week of the test. Total arsenic concentrations reached their test lows near the end of Phase I and remained at these levels through Phase II of the test. No significant rebound of arsenic concentrations was observed during the post-extraction period.

The reduction in total arsenic concentrations over time was most pronounced in the groundwater samples collected from monitoring wells WN-1D and WN-1E and is attributable to the reinjection effect. However, significant reductions in total arsenic concentrations were noted in groundwater samples collected from monitoring wells screened at higher elevations, which is attributable to the drawdown effect.

5.2.2.3.2 GROUNDWATER ANALYTICAL DATA - WELL NEST WN-2

Well nest WN-2 is located along the middle of the north-south axis of the E/R Unit, approximately halfway between the central extraction well (EW-1) and the north

outboard extraction well (EW-3). As discussed in Section 3.0, five monitoring wells were constructed in each of the well nests to monitor groundwater quality at different elevations in the aquifer (see Figure 3.1). The location of WN-2 places it outside the center of the E/R Unit and near the edge of the unit.

During Phase I, the contaminant concentration trends exhibited in the well nest WN-2 data were similar to the contaminant concentration trends exhibited at well nest WN-1. However during Phase II, an apparent rebound of contaminant concentrations was noted in the groundwater samples collected from monitoring well WN-2E. This apparent concentration rebound was observed in each of groundwater contaminant suites (i.e., general chemistry analytes, SVOCs, VOCs, and total arsenic) and is illustrated in the graphs for ammonia, 2-methylphenol, benzene, and arsenic (provided as Graphs 14 though 17 in Appendix N). Plots for the remaining analytes are included in the files provided in the attached CD (Appendix C). As noted in the referenced graphs, the concentration rebound effect, noted at monitoring well WN-2E, was not apparent in the groundwater samples collected from the other monitoring wells in the WN-2 cluster.

During Phase II of E/R Unit operation, the injection rates at the reinjection wells were unbalanced to maximize the recovery of the bromide tracer. Groundwater flow modeling indicated that optimal recovery of the bromide tracer could be achieved by "unbalancing" the tap water injection rates between the east and western bank of reinjection wells. However, unbalancing the injection rates changed the hydraulics of the test cell. The unbalanced injection rates resulted in an increased hydraulic gradient between the extraction wells and the exterior portions of the E/R Unit. This resulted in greater groundwater flow and contaminant transport from outside the E/R Unit. The increases in the contaminant concentrations were noted in the groundwater samples collected from monitoring well WN-2E, which is located at the margin of the E/R Unit, which screened the basal gravel unit.

5.3 BROMIDE TRACER STUDY

5.3.1 OVERVIEW

The bromide tracer was injected into the E/R Unit during Phase II of E/R Unit operation. Bromide tracer was injected into the center well of the western row of reinjection wells (RW-2). The injection rates at the reinjection wells were adjusted to maximize the recovery of the bromide tracer. Based on the results of groundwater flow modeling, it was determined that optimal recovery of the bromide tracer could be

achieved by "unbalancing" the tap water injection rates between the east and west bank of reinjection wells.

The bromide tracer study was performed over a period of 4 weeks. During that time, groundwater samples collected from well nests WN-1 and WN-2, and extracted water samples collected from EW-1, EW-2, and EW-3 were analyzed for bromide. The bromide analytical data were evaluated to determine groundwater flow paths and hydraulic characteristics of the E/R Unit.

5.3.2 BROMIDE TRACER ANALYTICAL DATA

5.3.2.1 WELL NEST BROMIDE DATA

Well Nest WN-1

Well nest WN-1 is located along the middle of the east-west axis of the E/R Unit, approximately halfway between the middle reinjection well in the western row of extraction wells (RW-2) and the central extraction well (EW-1). Due to its location within the centerline of the E/R Unit, the analytical data from well nest WN-1 is representative of contaminant concentration trends within a groundwater remediation cell. The bromide analytical data compiled from groundwater samples collected from the E/R Unit during the tracer study are summarized in the plots provided as Graphs 1 through 4 in Appendix P.

The bromide tracer study began at 11:00 AM on October 24, 2000 and the first evidence of bromide tracer detection was noted in the groundwater sample collected from monitoring well WN-1E at approximately 6:00 p.m. on October 28, 2000. Monitoring well WN-1E is screened in the lowest potion of the shallow aquifer, where a basal gravel layer is present. The concentration of bromide reached a maximum of 1,400 mg/L in the groundwater samples collected from monitoring well WN-1E on October 29, 2000, before trending gradually downward for the remainder of the test. The concentration of bromide in the last groundwater sample collected from monitoring well WN-1E was 17 mg/L. The concentration of bromide prior to the arrival of the tracer was below 1 mg/L in groundwater samples collected from monitoring well WN-1E indicating that bromide tracer continued to pass through the basal stratigraphic unit at the conclusion of the test.

The first evidence of bromide tracer arrival at monitoring well WN-1D, the next higher monitoring well in the WN-1 cluster, occurred on October 31, 2000, approximately

3 ½ days after bromide appeared in monitoring well WN-1E. The bromide tracer concentration reached a maximum of 340 mg/L in the groundwater sample collected from monitoring well WN-1D on November 2, 2000. The bromide concentrations in groundwater samples collected from WN-1D then fell rapidly. By November 7, 2000, bromide concentrations in groundwater samples collected from WN-1D returned to the concentrations noted prior to the arrival of the bromide tracer. In contrast to the bromide data at monitoring well WN-1E, the peak bromide concentration observed at monitoring well WN-1D was lower by approximately one-third, and narrower (rising then falling back to background levels sooner).

Two bromide peaks are noted in groundwater samples collected from WN-1C, which is screened above monitoring well WN-1D. The first occurred on November 2, 2000 and the second was on November 6, 2000. The maximum concentration of bromide observed in groundwater samples collected from WN-1C was 76 mg/L on November 7, 2000 and fell quickly to 3 mg/L the following day. By November 15, 2000, the bromide concentrations in groundwater samples collected from WN-1C were near the concentrations noted before the arrival of the bromide tracer. The concentration of bromide in groundwater samples collected from monitoring wells WN-1A and WN-1B generally did not exceed 1 mg/L and there are no strong trends in the bromide data noted in the groundwater samples collected from these monitoring wells. This indicates that the bromide tracer passed through the shallow aquifer at elevations below the screened interval of monitoring well WN-1B.

The bromide tracer data for groundwater samples collected from well nest WN-1 indicated that the primary bromide flow path was through the lowermost portion of the shallow aquifer. Moreover, nearly the entire mass of bromide traveled through the portion of the aquifer screened by monitoring wells WN-1D and WN-1E. The bromide tracer passed through the shallow aquifer at elevations below the screened interval of monitoring well WN-1B. These data suggest that the primary zone of groundwater removal during the bromide test occurred below the elevation of the screened interval of monitoring well WN-1B and primarily in the lowermost 5 feet of the shallow aquifer where the highest concentrations of contaminants are present.

Well Nest WN-2

Well nest WN-2 is located along the middle of the north-south axis of the E/R Unit, approximately halfway between the central extraction well (EW-1) and the north outboard extraction well (EW-3). The location of WN-2 places it outside the center of the E/R Unit and near the edge of the unit. The bromide analytical data compiled from

groundwater samples collected from well nest WN-2 monitoring wells during the tracer study are summarized in Graph 2 in Appendix P.

In general, the bromide concentrations noted in the groundwater samples collected from well nest WN-2 were much lower than the concentrations observed in well nest WN-1. As shown in Graph 2, bromide concentrations in monitoring well WN-2E rose and fell somewhat erratically during the test. The maximum concentration of bromide (39 mg/L) was observed in the groundwater sample collected from monitoring well WN-2E on the final day of the test. The bromide analytical data do not provide compelling evidence that any significant amount of bromide moved through at higher elevations within the aquifer at the WN-2 location.

Although bromide was sporadically detected in groundwater samples collected from WN-2E, the bromide analytical data for well nest WN-2 suggest that the primary flow path in the aquifer was along the central portion of the E/R Unit between reinjection well RW-2 and extraction well EW-2.

5.3.2.2 EXTRACTED WATER BROMIDE DATA

5.3.2.2.1 BROMIDE CONCENTRATION TRENDS

Groundwater analytical data from extracted water samples collected from the three E/R Unit extraction wells during the bromide tracer study is presented in Graph 3 in Appendix P. The only extraction well that exhibited a significant response to the injection of bromide was extraction well EW-1, the center extraction well. The concentration of bromide in water samples collected on October 23, 2000, prior to startup of the tracer study, was higher in the samples collected from extraction wells EW-2 and EW-3 than in the water sample collected from EW-1. The bromide concentrations noted in the water samples collected from extraction wells EW-2 and EW-3 were 10 mg/L and 9 mg/L, respectively while the water sample collected from EW-1 before startup was 1.8 mg/L. Extraction wells EW-2 and EW-3 are the two outboard extraction wells in the E/R Unit while extraction well EW-1 is the central extraction well.

As discussed previously in this section, extraction well EW-1 is hydraulically isolated from the exterior of the E/R Unit by reinjection wells and extraction wells, which surround it. The two other extraction wells, EW-2 and EW-3, operate on the exterior of the E/R Unit. As such, these outer extraction wells will draw groundwater from the exterior of the E/R Unit. The initial extracted water samples collected from the two

outer extraction wells would be strongly influenced by background aquifer conditions. The higher initial bromide concentrations at extraction wells EW-2 and EW-3 are the result of background bromide concentrations in the aquifer. Clean tap water was injected into the aquifer for 2 weeks before the startup of the bromide tracer test. Consequently, the bromide concentrations inside the E/R Unit at the start of the test were much lower.

EW-1 is the only location where extracted water analytical data demonstrated any significant bromide concentrations above background. The first evidence of bromide tracer detection in extracted water was noted in the groundwater sample collected from extraction well EW-1 on October 30, 2000, approximately 6 days following the beginning of the bromide tracer study. The bromide concentration in EW-1 extracted water reached a maximum of 39 mg/L on October 31, 2000, then began trending downwards.

5.3.2.2.2 BROMIDE MASS REMOVAL

Graph 4 in Appendix P depicts the bromide mass recovery over time at extraction well EW-1, EW-2, and EW-3. As illustrated in the attached graph, bromide mass recoveries at extraction wells EW-2 and EW-3 were linear over time. This indicates that the bromide recovered at these locations during the tracer study was largely due to background bromide present in the aquifer. The bromide mass recovery curve for extraction well EW-1 begins to rise steeply on October 29, 2000 indicating the arrival of the bromide front. On November 19, 2000, approximately 21 days following the detection of the bromide front at EW-1, bromide tracer recovery at EW-1 becomes asymptotic.

A total of approximately 792 grams of bromide was injected at reinjection well RW-2 and approximately 398 grams of bromide, 50 percent of the mass injected, was recovered at extraction well EW-1. The bromide tracer test provided sufficient information from which to determine groundwater flow paths, estimate aquifer hydraulic parameters, and gauge test cell performance.

5.3.3 TEST CELL HYDRAULIC CONDUCTIVITY CALCULATIONS

The bromide tracer data were used to calculate average groundwater flow velocity and hydraulic conductivity within the E/R Unit. Since the distances between monitoring points, the hydraulic gradient, and the length of time for bromide tracer travel between points are known for the E/R Unit, the average groundwater flow velocities observed during the test can be estimated. The time that the injected tracer takes to travel from

the reinjection well (RW-2) until it is detected at a monitoring well and/or extraction well provides a good approximation of the average horizontal groundwater velocity (V). If the average horizontal groundwater velocity, the horizontal hydraulic gradient (i), and the porosity (n) are known, it is possible to calculate the horizontal hydraulic conductivity (K). It is noted that the groundwater flow velocities and hydraulic conductivity values determined herein are representative of conditions in the small portion of the shallow aquifer evaluated during the test. The hydraulic conductivity values were determined for comparison to the slug test data generated during the Pilot Project and the RI. Additionally, these values were used evaluate the magnitude of the hydraulic conductivity at different elevations within the test cell.

The formula to calculate the average horizontal hydraulic groundwater velocity is:

$$V=Ki/n$$

Rearranging this formula to solve for K:

$$K=Vn/i$$

The bromide tracer took from 4.29 days to 9.06 days to reach WN-1E and WN-1C, respectively. Appendix Q summarizes in input parameters and calculations used to estimate the average horizontal groundwater velocity and the horizontal hydraulic conductivity. The porosity of the aquifer was assumed to be 0.38 (38 percent) based on geotechnical testing results presented in Table 4.6.3 of the RI report. Horizontal hydraulic gradients were calculated from the E/R Unit average groundwater elevations presented in Table 5.1.

Average groundwater flow velocities ranged from 0.60 foot/day between RW-2 and WN-1C to 1.72 feet/day between RW-2 and EW-1. Using the calculated velocities, a porosity of 0.38, the average horizontal hydraulic gradient and the formula noted above, the horizontal hydraulic conductivity was calculated (see Appendix Q). The calculated horizontal hydraulic conductivity values ranged from 9.2 feet/day based on data from WN-1E to 5.8 feet/day based on data from WN-1D. The average hydraulic conductivity value that was calculated from data collected at monitoring well nest WN-1 (monitoring wells WN-1C, WN-1D, and WN-1E) was 7.3 feet/day. The hydraulic conductivity value calculated from data collected at EW-1 was 6.7 feet/day.

The table below summarizes the calculated average groundwater flow velocities and hydraulic conductivity values determined from the central reinjection well to the location noted using the bromide tracer data.

Location	*Horizontal Groundwater Velocity (feet/day)*	*Hydraulic Conductivity (feet/day)*
WN-1E	1.26	9.2
WN-1D	0.68	5.8
WN-1C	0.60	6.9
EW-1	1.72	6.7

The average hydraulic conductivity value calculated from the tracer test correlate well with the hydraulic conductivity values calculated from response tests. The geometric mean hydraulic conductivity value from the response tests conducted prior to the Pilot Project and the geometric mean hydraulic conductivity value calculated during the RI for the deep wells that intersect the gravelly zone (see page 98 of the RI report) were both at 5.4 feet/day.

The hydraulic conductivity value used to design the Pilot Project was 30 feet/day. However, the data generated from response testing and the bromide tracer study suggest that the hydraulic conductivity of the shallow aquifer lies closer to 10 feet/day. The implications of the aquifer hydraulic conductivity must be considered to optimize full-scale system design. This would include groundwater modeling to assess the effects of hydraulic conductivity and aquifer gradients on optimal well spacing, screened intervals, pumping rates, and length of operation.

5.3.4 GROUNDWATER FLOW IN THE E/R UNIT

Groundwater flow was evaluated using groundwater elevation data calculated from the daily water level measurements (see Table 4.2). As noted in Section 3.0, the E/R unit was operated in two phases. The Phase I (mass removal) portion of the test operated from October 9, 2000 through October 23, 2000 and Phase II (bromide tracer test) operated from October 24, 2000 through November 20, 2000.

Phase I

During Phase I, the E/R Unit was pumped at an average rate of approximately 3 L/m for a period of 2 weeks. The Phase I operation was intended to optimize conditions for evaluating contaminant concentration trends in the aquifer. Appendix R provides

pre-extraction and daily groundwater contour plots of the groundwater elevations from the extraction and reinjection wells of the E/R Unit during Phase I operation. The pre-extraction groundwater contours shows that the water table within the E/R Unit was relatively flat (see Figures 4.2 and 4.3). Groundwater flow during the operational portion of Phase I was generally from the injection wells towards the extraction wells.

Table 5.1 summarizes the average groundwater elevations during Phase I. These data suggest a downward vertical component to flow is present based upon a decrease in groundwater elevation with depth within the monitoring well nests. Table 5.1 also summarizes the average horizontal hydraulic gradients across the E/R Unit during Phase I. The average horizontal hydraulic gradients between the extraction wells and reinjection wells ranged from 0.089 ft/ft between RW-6 and EW-2 to 0.157 ft/ft between RW-4 and EW-3.

Phase II

The bromide tracer study (Phase II) was operated for 4 weeks, from October 24 to November 20, 2000. During Phase II, the reinjection flow rates were unbalanced to maximize recovery of the bromide tracer. The pumping rate remained at approximately 1 L/min at each extraction well. However, the injection rates at the upgradient injection wells (RW-1, RW-2 and RW-3) were reduced to approximately 200 mL/min. The injection rates at the downgradient reinjection wells (RW-4, RW-5, and RW-6) were increased to approximately 930 mL/min.

Appendix R provides daily groundwater contour plots of the groundwater elevations from the extraction and reinjection wells of the E/R Unit during Phase II operation. The October 24, 2000 shutdown period groundwater contours shows that the water table within the E/R Unit was relatively flat with only a 0.03 foot difference across the unit. This plot shows that the E/R Unit appears to have nearly returned to static conditions prior to starting Phase II. Groundwater flow during the operational portion of Phase II was generally from the injection wells towards the extraction wells. However, the hydraulic gradient on the east side of the E/R Unit (RW-4, RW-5, and RW-6) had a steeper hydraulic gradient, which was the intent of unbalancing the injection rates.

These data also suggest a minor downward vertical component of flow is present. Table 5.1 summarizes the average horizontal hydraulic gradients across the E/R Unit during Phase II. The average horizontal hydraulic gradients between the extraction wells and reinjection wells ranged from 0.0784 ft/ft on the west side between RW-3 and EW-2 to 0.2745 ft/ft on the west side between RW-4 and EW-3.

5.4 ANALYTE MASS REMOVAL

Using the known extraction rates and the analytical data compiled during the Pilot Project, graphs depicting cumulative mass removal from each test unit were compiled. This subsection summarizes the significant findings of the mass removal data.

5.4.1 E UNIT

Cumulative mass removal graphs for the E Unit exhibited stepwise increases in cumulative mass removal due to the cyclical operation of the unit (1 week on followed by 1 week off). Cumulative mass removal graphs for all of the compounds illustrate the greatest mass was removed during the first operational period. This is expected since the highest concentrations of contaminants were noted during the initial week of operation and the extraction rate was greatest during that initial period. During each of the three subsequent operational periods, the pumping rate was stepped down and less mass was removed as a result.

Graphs 1 through 4 in Appendix O depict the cumulative mass removal observed in the E Unit for the general chemistry analytes, SVOCs, VOCs and total arsenic.

The table below summarizes the mass removal observed in the E Unit for these analytes.

Analyte	*Mass Removed Week 1 (grams)*	*Total Mass Removed (grams)*	*Percent of Total Mass Removed In Week 1*
Ammonia	49,000	67,800	72
Total Cyanide	24.9	26.7	93
Total Phenolics	24,910	26,750	93
Phenol	3,270	3,660	89
Benzene	28	43.8	64
Toluene	13.1	23.3	56
Arsenic	133	185	72

As illustrated by the preceding table, approximately 50 to 95 percent of the total mass of these compounds removed during the test were removed during the first week of the test. This is attributed to the reduction in contaminant concentrations due to the

drawdown effect and the progressive decrease in groundwater extraction rates during the test.

5.4.2 E/R UNIT

Graphs 5 through 15 in Appendix O depict the cumulative mass removal observed at extraction well EW-1 in the E/R Unit for the general chemistry analytes, SVOCs, VOCs and total arsenic. Each of the graphs depicts mass removal at each of the three extraction wells in the E/R Unit. As discussed previously in this section, extraction well EW-1 is hydraulically isolated from the exterior of the E/R Unit by reinjection wells and extraction wells, which surround it. The two other extraction wells, EW-2 and EW-3, operate on the exterior of the E/R Unit. As such, these outer extraction wells will draw groundwater from the exterior of the E/R Unit and contaminated groundwater from outside the E/R Unit will enter these extraction wells during the duration of the test. As such, it is not appropriate to evaluate mass removal from these wells since the mass removal will be influenced by conditions outside the test cell. Conversely, the mass removal data from the center extraction well, EW-1, is representative of the response within the test cell and these data are discussed herein.

The table below summarizes the mass removal observed at extraction well EW-1 the E/R Unit for the major analytes of concern.

Analyte	*Mass Removed Phase I (grams)*	*Total Mass Removed (grams)*	*Total Mass Removed During Phase I (percent)*
Ammonia	26,000	28,300	92
Total Cyanide	7.6	7.8	97
Total Phenolics	17,200	17,700	97
Phenol	3,660	3,740	97
Benzene	14.5	17.3	84
Toluene	5.3	6.7	79
Arsenic	190	224	85

The total mass of contaminants removed from extraction well EW-1 is generally lower than that removed from EW-4. However, EW-4 operated with an effectively unlimited contaminant source. However, since EW-1 was surrounded by extraction and reinjection wells, it operated in an area hydraulically limited in size and contaminant

mass. In spite of these limitations, mass removed from the E/R Unit was comparable to that of the E Unit.

It is noted that for each of the groundwater contaminants, the mass removal curve for EW-1 approaches an asymptote near the end of the Phase I portion of the E/R Unit test. This indicates that mass removal efficiency was greatest during the early portion of the test but, as the test progressed, less mass was removed per unit of operating time. For example, over 26,000 grams of ammonia were removed at EW-1 during the first two weeks of the test (an average of 13,000 grams/week). However, during the latter four weeks of the test only and additional 2,000 grams of ammonia was removed at EW-1 (and average of only 500 grams/week). Furthermore, as the test progressed, the rate of ammonia removal per unit of time declined even further, indicating even less efficient operation. As indicated in the table above, over 90 percent of the entire mass of ammonia removed was recovered during the first 2 weeks of E/R Unit operation. Similar mass removal trends were observed for the other analytes of concern such that by the end of Phase I, mass removal trends had become asymptotic for the general chemistry analytes and SVOCs. Mass removal for the VOCs and arsenic became asymptotic by the second to third week of Phase II operation.

Contaminant mass removal trends in the E Unit are attributed to the groundwater pumping rates and the drawdown effect. However, although initial contaminant mass removal in the E/R Unit is attributable to the drawdown effect, the reinjection effect acts to depress contaminant concentrations further through the flushing of clean water through the treatment area. The reinjection effect prevents groundwater from outside the treatment cell from entering the cell and re-contaminating the treatment zone. The drawdown and reinjection effects work in tandem in the E/R Unit to depress contaminant concentrations and to minimize recontamination of the treatment zone.

5.4.3 AQUIFER FLUSHING IN THE E/R UNIT

Since the dimensions of the E/R Unit and the groundwater pumping rates are known, the number of pore volumes flushed through the E/R Unit to attain asymptotic mass removal conditions may be estimated. The as-built surface area of the E/R Unit encompassed by the outer reinjection wells and outer extraction wells is approximately 166 square feet. As designed, the primary zone of treatment in the E/R Unit occurred through the central portion of the E/R Unit. This zone of treatment lies approximately two feet on each side of the centerline that joins reinjection well RW-2, well nest WN-1, extraction well EW-1, and reinjection well RW-5 (see Figure 3.1). This treatment area

represents approximately one-half of the total surface area of the cell (approximately 83 square feet).

The total thickness of the aquifer from the top of the water table to the top of the till unit is approximately 28 feet (581.7 feet to 553.4 feet). However, the E/R Unit focused treatment on the lower 10 feet of the aquifer. This was demonstrated by the bromide tracer test data, which indicated that the tracer reached monitoring well WN-1C but was not detected in monitoring wells screened at higher elevations. Therefore, the base of monitoring well WN-1B was set as the elevation below which groundwater removal in the E/R Unit was focused.

The porosity of the sand unit was reported in the RI to be approximately 38 percent. Therefore, the volume of groundwater in the E/R Unit treatment zone is approximately 315 cubic feet (83 square feet x 10 feet x 0.38) or approximately 2,400 gallons (9,100 liters). Groundwater extraction in at EW-1 was conducted at a rate of approximately 1 L/min (1,440 L/day). Therefore, one pore volume of groundwater was purged from the treatment zone every 6.4 days. For most general chemistry analytes and all of the SVOCs, contaminant mass removal became asymptotic at extraction well EW-1, near the end of Phase I to the first week of Phase II (approximately 12 to 18 days of operation). Consequently, it is estimated that between 1.5 and 3 pore volumes were purged from the treatment zone in the E/R Unit to attain optimal mass removal for these contaminants. Ammonia, arsenic and the VOC mass removal became asymptotic during Phase II, approximately 21 to 28 days into the test. This equates to between approximately 3 to 4.5 pore volumes removed to attain asymptotic conditions.

5.5 SUMMARY AND CONCLUSIONS OF THE PILOT PROJECT

Section 7.0 of the Work Plan (May 23, 2000) set forth several hydrogeological data analysis goals. Chemical data collected prior to and during operation of the E and E/R Units are to be assessed to address several design issues. These design issues are reiterated below followed by a brief explanation on how the issues were addressed by the Pilot Project.

1. *Evaluate geophysical profiles for comparison with monitoring well nest data to determine the usefulness of these profiles for full-scale vertical characterization of groundwater.*

    - The stratified distribution of contaminants at the Site observed during the RI was confirmed by the Pilot Project analytical data. The initial concentrations of the analytes were highest in the groundwater samples collected from the

deepest monitoring wells and were significantly lower in groundwater samples collected from the wells screened at higher elevations. These data indicate that the bulk of the contaminant mass lies in the lower few feet of the aquifer.

- The UVF data were not useful for characterizing vertical groundwater quality. These data indicate that the contaminants present do not fluoresce to UVF. Therefore, UVF does not appear to be an effective screening tool for the contaminants at the Site.

- Results from the EC monitoring logs indicate that the elevated concentrations of salts present in the lower portion of the upper sand unit are detectable using CPT/EC. Consistent with the contaminant concentration data, EC response increased with depth in the aquifer. Therefore, EC may be useful as a screening tool for development of a vertical profile of groundwater contamination. EC would need to be used in conjunction with limited confirmational vertical aquifer sampling to determine vertical concentration profiles.

2. *Analyze a series of time versus concentration plots of the groundwater analytical data to estimate contaminant mass removal, concentration decay rates and removal limitations under full-scale operation.*

   - The contaminant mass removal rate in the E Unit decreased significantly over time. This is attributed to the stepping down of groundwater pumping rates and vertical mixing of groundwater during the first operational period.

   - Analyte concentrations were observed to decrease in E Unit extracted water during the first week of operation.

   - Although a portion of the initial contaminant mass removal in the E/R Unit is attributable to the drawdown effect, the reinjection effect acts to depress contaminant concentrations further through the flushing of clean water through the treatment area. The reinjection effect prevents groundwater from outside the treatment cell from entering the cell and re-contaminating the treatment zone. The drawdown and reinjection effects work in tandem in the E/R Unit to depress contaminant concentrations and to minimize recontamination of the treatment zone resulting in more efficient operation.

   - E/R Unit data indicate that mass removal efficiency was greatest during the early portion of the test. However, as the test progressed, less mass was removed per unit of operating time.

- Between 1.5 and 4.5 pore volumes were purged from the treatment zone in the E/R Unit to attain effective mass removal.

3. *Evaluate the effects of reinjection through comparison of time series plots of groundwater analytical data.*

   - Downward concentration trends were noted in groundwater samples collected from monitoring wells screened at higher elevations in both the E Unit and the E/R Unit.

   - The analytical data from well nest WN-3 in the E Unit demonstrated no significant downward concentration trends in the most contaminated zones indicating that groundwater pumping alone had no effect on the concentrations of contaminants in the aquifer. This is the result of an effectively unlimited source of contaminants under the conditions of the study. This contrasts with the E/R Unit where the reinjection effect prevents groundwater from outside the test cell from entering and re-contaminating the remediation zone.

   - In contrast to the well nest analytical data in the E Unit, the contaminant concentrations in the E/R Unit well nests exhibited significant downward trends during Phase I of E/R Unit operation. These data demonstrate that the reinjection effect was more efficient at lowering the contaminant concentrations throughout the test cell. The reinjection effect acts to reduce contaminant concentrations through the flushing of injected water through the treatment area. The reinjection effect also prevents contaminated groundwater from outside the treatment cell from entering the cell and re-contaminating the treatment zone resulting in more efficient operation. Based upon the much higher starting concentrations and the lower final concentrations, the E/R Unit is more efficient at reducing the contaminant concentrations in the aquifer.

   - E/R Unit monitoring well concentration trend data demonstrated reinjection reduced the contaminant concentrations in the zone of highest contamination in the shallow aquifer over a relatively short operating period. This indicates that groundwater removal was focused on the lower portion of the shallow aquifer where the bulk of the contaminant mass is present.

4. *Determine the impact of variation of groundwater extraction rates.*

   - The E Unit monitoring well analytical data demonstrated that variation of groundwater pumping rates had no effect on the concentrations of contaminants in the aquifer.

5. *Evaluate the impact of cyclical versus continuous groundwater extraction.*

   - There was no demonstrable effect as a result of cyclical operation of the E Unit suggesting that cyclical operation would not enhance contaminant recovery.

6. *Estimate the effects of adsorption/desorption during intermittent operation of the E Unit and post-extraction groundwater sampling.*

   - In general, there was no significant rebound of contaminant concentrations in the E Unit during the post-extraction period in the E Unit.
   - There was no demonstrable effect from the cyclical operation of the E Unit.
   - There was no significant rebound of contaminant concentrations during the post-extraction period in the E/R Unit.

In addition to the conclusions summarized above, the following conclusions were derived from evaluation of the bromide tracer data, which were obtained under conditions of unbalanced reinjection.

- The bromide tracer test provided sufficient information from which to determine groundwater flow paths, estimate aquifer hydraulic parameters, and gauge test cell performance.
- The bromide tracer data for groundwater samples collected from well nest WN-1 indicated that the primary bromide flow path was through the lowermost portion of the shallow aquifer. The bromide tracer passed through the shallow aquifer at elevations below the screened interval of monitoring well WN-1B. These data suggest that the primary zone of groundwater removal occurred below the elevation of the screened interval of monitoring well WN-1B. However, the bulk of the bromide tracer passed through the lowermost 5 feet of the shallow aquifer where the highest concentrations of contaminants are present. These data indicate that groundwater removal was focused on this deeper zone were the bulk of the contaminant mass resides.
- The average hydraulic conductivity value calculated from the tracer test correlate well with the hydraulic conductivity values calculated from response tests. The geometric mean hydraulic conductivity value from the response tests conducted prior to the Pilot Project and the geometric mean hydraulic conductivity value calculated during the RI for the deep wells that intersect the gravelly were both at 5.4 feet/day.

- The hydraulic conductivity value used to design the Pilot Project was 30 feet/day. However, the data generated from response testing and the bromide tracer study suggest that the hydraulic conductivity of the shallow aquifer lies closer to 10 feet/day. The implications of the aquifer hydraulic conductivity must be considered to optimize full-scale system design. This would include groundwater modeling to assess the effects of hydraulic conductivity and aquifer gradients on optimal well spacing, screened intervals, pumping rates, and length of operation.

6.0 TREATABILITY STUDY

The Treatability Study is based on the May 23, 2000 "Pilot Project Work Plan, Waukegan Manufactured Gas and Coke Plant, Waukegan, Illinois", by NewFields, Inc. Several modifications were necessary during implementation of the Treatability Study primarily due to the unavailability of the ANDCO electro-chemical precipitation technology and the unexpected higher concentration of ammonia. The deletion of the ANDCO process and its replacement with a chemical oxidation process was identified in a June 23, 2000 letter to USEPA modifying the Treatability Study Work Plan that was submitted to USEPA in June 2000. Modifications that were made in response to groundwater are identified throughout the description of the Treatability Study.

The purpose of the Treatability Study is to evaluate potential treatment technologies for groundwater collected at the Site. The Treatability Study consists of two basic parts; pretreatment for arsenic removal and biological treatment for removal of organic constituents, ammonia, and thiocyanate. As expected, partial removal of thiocyanate and phenols was also achieved during pretreatment.

6.1 TREATMENT SAMPLE

The sample subject to Treatability Studies was comprised of 15 5-gallon sealed plastic pails. The pails were filled by pumping from approximately the midpoint of the first full 20,000-gallon storage tank on Site. The first tank was filled by pumping from EW-4 for 7 days at an average rate of 2.8 L/min followed by pumping from EW-1, EW-2, and EW-3 for approximately 5 days at a combined average rate of 3 L/min. The samples were collected on October 30, 2000 and shipped to the CRA Treatability Laboratory.

A raw water sample was collected and analyzed for a wide range of parameters as reported in Table 6.1. A few key parameters had results substantially higher than the water used in the 1998 Treatability Study (Fluor Daniel, 1998). The raw water total ammonia concentration was 1,890 mg/L, total phenols was 617 mg/L, thiocyanate was 408 mg/L, and COD was 3,240 mg/L. Total arsenic was less than the 1998 Study concentration at 9.7 mg/L.

The 1998 Study determined that there was a strong inhibitory effect by the groundwater matrix on nitrification. This inhibition was thought to be related to elevated concentrations of groundwater constituents, particularly phenol and thiocyanate. The treatment proposed in the Work Plan consisted of systems to address each constituent of concern; pretreatment to reduce arsenic concentrations followed by biological treatment

using sequencing batch reactor (SBR) technology to treat organic constituents, ammonia, and thiocyanate.

Thiocyanate reacts chemically and biologically to produce ammonia. Consequently, the effective ammonia concentration was likely in excess of 2,000 mg/L. The high thiocyanate concentrations also have the potential to release hydrogen cyanide during pretreatment. The thiocyanate data from individual samples collected in the field was highly variable. The field samples were analyzed by a colorimetric method, Standard Methods 4500-CN M, in accordance with the project QAPP. The Treatability Laboratory analyzed a few samples from the Treatability Study by Ion Chromatography, modified EPA 300.0 method and obtained results approximately one order of magnitude lower than typical field sample results. A split sample was then analyzed by both methods with the following results:

- Colorimetric Method 3,100 mg/L
- Ion Chromatography 408 mg/L

This discrepancy prompted inquires to several laboratories regarding possible explanations for the difference. It was the collective opinion of all laboratories contacted that the Ion Chromatography results have the least opportunity for matrix interference and were the more accurate results. Consequently, all Treatability Study analyses were conducted by the Ion Chromatography Method.

Similar analytical discrepancies were determined for cyanide analyses. The field samples were analyzed by EPA Method 335.4 which involves distillation followed a colorimetric determination. The treatability lab used Standard Method 4500-CN, Flow Injection Analysis (FIA), a method in which the distillation step is replaced by a membrane process. Field sample results were generally <1 mg/L. Initial treatability characterization results were generally >100 mg/L. This discrepancy was investigated by:

1. sending the samples to outside labs that each used one of the two methods; and
2. spiking the samples with potential interference producing chemicals.

The results indicated that the high concentrations of thiocyanate present in the sample interfered with analysis by the Standard Methods 4500-CN FIA method. This exercise confirmed the very low cyanide concentrations present in the untreated water. As the treatability laboratory was not equipped to conduct EPA Method 335.4 and as the field

test data indicated that cyanide concentrations dropped to values less than the MCL (0.2 mg/L) in all extraction wells, cyanide analysis was discontinued.

6.2 ARSENIC PRETREATMENT WITH FENTON's REAGENT

The purpose of optimization tests was to determine the optimum ratio of reagents (ferrous sulfate and hydrogen peroxide) as well as the pH and reaction time required to reduce arsenic concentrations. 500 mL groundwater samples were treated at three pH values: 3.8, 5.5, and 7.5. All samples were mixed for 1 hour for the oxidation to be completed.

At each pH various amounts of hydrogen peroxide and ferrous sulfate were added. Each test (a given reagent ratio at specific pH) was conducted in triplicate and the treated samples were collected and analyzed as a composite. The results are presented in Tables 6.1, 6.2, and 6.3.

The results indicate that effective removal of arsenic (95 percent) can be achieved at a pH of 5.5 with the following dose of chemicals:

- hydrogen peroxide 300 mg/L; and
- ferrous sulfate 60 mg/L.

At the same testing conditions, approximately 50 percent of phenol and 20 percent of thiocyanate were removed.

Substantially lower removal of all above parameters (arsenic 70 percent, phenols 20 percent) was found for tests conducted at a pH of 3.8. This phenomenon is likely related to higher oxidation kinetics for organic, non-phenolic compounds at lower pH as compared to that for arsenic and phenols.

Tests conducted at a pH of 7.5, as shown in Table 6.6, also indicate lower removal of arsenic as compared to those at a pH of 5.5. These results are related to low effectiveness of Fenton reagent treatment at neutral pH due to lower stability of hydrogen peroxide and quenching of hydroxyl radicals by precipitating ferric hydroxide (E. Lipczynska-Kochany, 1993).

In addition to the tests proposed in the Work Plan, tests with humates were also conducted. The reason for application of humates (New-Mex Umates) was the higher

than expected concentration of thiocyanate. Fenton's reagent is more effective at low pH. At the same time thiocyanate at low pH can generate very toxic hydrogen thiocyanate. Humates have the ability to absorb both organic and inorganic substances and thus can prevent extensive generation of toxic gases. They also contain free radicals that potentially enhance the oxidation power of Fenton's reagent and allow the reaction to be conducted at neutral pH (Stevenson, 1994). For comparison, tests with humates without Fenton's reagent were also conducted.

Analyses of samples treated with humates are presented in Table 6.4. Analyses of samples treated with hydrogen peroxide and humates are presented in Table 6.5. Arsenic removal is limited under this pretreatment scenario.

Analyses of samples treated with Fenton's reagent and humates are presented in Table 6.6. As demonstrated in Table 6.6, an addition of humates to the Fenton's reagent allows efficient removal of arsenic at a pH of 7.5. At the same time humates without Fenton's reagent has negligible impact on arsenic removal.

6.3 BENCH SCALE PRETREATMENT

During bench scale pretreatment 20 L batches of the groundwater were pretreated with Fenton's reagent (H_2O_2 = 300 mg/L, $FeSO_4$ = 60 mg/L) in the presence of humates (1,000 mg/L), as optimized during initial pretreatment tests. The 20 L batches were prepared as they were required to feed into the biological treatment reactor. A total of six batches were prepared during the bench scale operation.

The pretreatment procedure was as follows:

- 20 L of groundwater was initially treated with 20 g of humates and sulfuric acid to adjust the pH to 7.5.
- Then 1,200 mg of ferrous sulfate was added and the reaction mixture was mixed for 10 minutes.
- Finally 4,000 mg of hydrogen peroxide was added and mixing was continuing for 1 hour.

Samples of pretreated groundwater were collected and analyzed for all parameters listed in Table 2 of the Work Plan. Results of the analyses are presented in Table 6.7.

After settling, the supernatant from the pretreated groundwater was fed into the batch biological reactor.

In order to evaluate the possible simplification of the treatment system the groundwater from the initial batch of pretreated groundwater was pumped into the biological reactor without filtration.

6.4 BIOLOGICAL TREATMENT

6.4.1 ACCLIMATIZATION

The purpose of acclimatization was to prepare the biomass to treat the target water. The biomass was collected from the activated sludge sampling line of an active coke wastewater treatment plant at a Bethlehem Steel plant in Buffalo, New York. The sludge was taken directly to the CRA Treatability Laboratory. Since the concentration of ammonia in the investigated groundwater was higher than expected the acclimatization schedule was modified.

In order to avoid substantial upset of the biomass a larger volume (10 L) of the activated sludge and high concentration of suspended solids (VSS >10,000 mg/L) was maintained during the whole acclimatization period. In addition, the acclimatization time was also extended to 2 weeks while increasing the influent volume of pretreated groundwater from 100 mL on day 1 to 1,000 mL on day 15.

Samples of the supernatant were collected every 2 days and analyzed for: TSS, VSS, SCOD, phenols, ammonia, and nitrate. No sludges were wasted during that time, and the volume of samples collected for analyses were small (~100 mL each) as compared to the volume of the reactor (10 L). Results of these analyses are presented in Table 6.8.

As shown in Table 6.8 after 2 weeks of acclimatization efficient removal of phenols was maintained despite an increased dose of pretreated groundwater. A steady increase of nitrate concentration indicates that nitrification of ammonia was also achieved.

Microscopic examination of the biomass also confirmed that microorganisms were vigorous and diversified.

6.4.2 INITIAL BIOLOGICAL TESTS

The purpose of initial biological tests was to investigate the use of a single reactor SBR system to treat the pretreated groundwater from the Site. Due to much higher than expected concentrations of ammonia in the groundwater operational parameters were also modified.

The following operating parameters were applied:

- Hydraulic Retention Time: 8 days (instead of 1 day)
- Solid Retention Time: 30 days (instead of 15 to 20 days)
- Mix Liquor Suspended Solids: 10,000 to 12,000 mg/L (instead of 3,000 to 5,000 mg/L)

Two cycles of SBR treatment per day (24 hours) were used. Each cycle lasted approximately 12 hours. Within these cycles the impact of separate periods of task duration on system performance was tested in the following ranges for a period of approximately 2 weeks:

- aerated fill: 2 to 3 hours
- non aerated fill: 3 to 4 hours
- aerated fill: 1 hour
- aerated react: 3 to 5 hours
- settle: 2 to 3 hours
- draw: 0.5 hour

Based on the properties of the effluent, particularly on COD and phenols removal, the following operational parameters were applied:

- non aerated/mixed fill: 1 hour
- aerated fill: 1.5 hour
- aerated react: 5 hours
- settle: 2 hours
- draw: 0.5 hour
- dissolved oxygen: >5 mg/L
- pH: 7 to 8

- Mixed Liquor Suspended Solids: 10,000 to 11,000 mg/L

The parameters pH and dissolved oxygen (DO) were monitored constantly. DO was always >5 mg/L. The pH had a tendency to drift down. As a result, to maintain the appropriate pH range, approximately 5 g of sodium bicarbonate was added at the beginning of every cycle. In addition, pH was adjusted using 1 N sodium hydroxide solution.

It was found that settling of solids in the effluent from the system was very slow with colloid-like particles remaining in suspension for many hours. Consequently, coagulation/flocculation tests using various polyelectrolytes as well as alum and ferric chloride were conducted to reduce settling times. The best results (fast settling with small amount of chemicals added) were found for the treatment with two polyelectrolytes applied in sequence:

1. 5 mg/L of anionic coagulant FL-9 (DearBorn); and
2. 7 mg/L of cationic flocculant DB-996 (DearBorn).

Beginning on December 15, 2000, these two chemicals were applied at the end of the react period, substantially reducing the amount of suspended solids in the effluent. Previous experience with FL-9 and DB-996 indicates that the chemicals do not affect the biological treatment process.

Supernatant samples were collected daily and analyzed for the parameters listed in Table 3 of the Treatability Study Work Plan. Results of these analyses are presented in Table 6.9.

As presented in Table 6.9, one SBR system was able to remove the main parameters of concern from the groundwater, achieving the following specific removals:

- phenols: 99.9 percent
- thiocyanate: > 95 percent
- all specific organic compounds analyzed by GC/MS technique: >90 percent

A substantial reduction of total soluble organic substances as DOC (70 to 90 percent), was also achieved. The variability in the DOC effluent results is a function of the high biomass concentration (~10,000 mg/L), which produces soluble organics as treatment proceeds.

On average, the system was also able to remove approximately 50 percent of ammonia. However, this removal was not sustained over time, suggesting that the system never reached stable operations.

To reduce the concentration of ammonia in the effluent a two reactor SBR system was set up in the final stage of the study. In this system the effluent from reactor SBR-1 was used as a feed to reactor SBR-2. The biomass in SBR-2 was fed with a small amount of pretreated groundwater and a solution of ammonium chloride to maintain a sufficient population of nitrifiers.

To simplify the operation of the whole system reactor SBR-2 was operated using the same parameters (period durations) as for reactor SBR-1. During this part of the study polyelectrolytes were not added to reactor SBR-1 but only to reactor SBR-2. Thus, accumulation of the polymers was substantially reduced. In addition, approximately 200 mL of the biomass from SBR-2 was transferred into SBR-1 every day. The same volume of the biomass from SBR-1 was at the same time transferred into SBR-2.

Results of effluent analyses from the two SBR system are presented in Table 6.10. They indicate that the two-reactor system may have been more stable than the single SBR in terms of nitrification. The two SBR system achieved an average ammonia removal of approximately 60 percent during the 25-day operation of the system, which is not indicative of optimal nitrification.

6.5 SUMMARY AND CONCLUSIONS OF THE TREATABILITY STUDY

Section 7.2 of the Work Plan (May 23, 2000) presents three data analysis goals. Data collected during the bench-scale treatment operation are to be used to address these goals. The goals are paraphrased below followed by a brief explanation on how the goals were addressed in the treatability study.

1. *Determine the removal efficiency for arsenic, phenols, cyanide, and thiocyanate and the nitrification (ammonia conversion to nitrate) efficiency.*

    - Arsenic removal in chemical oxidation pretreatment is generally 80 to 90 percent.
    - Cyanide removal is not a treatment issue at the WCP Site due to the low concentrations in untreated groundwater (extracted water concentrations reduced to less than MCL after pumping).

- Phenolics removal in combined pretreatment and biological treatment is greater than 99 percent.
- Thiocyanate removal in combined pretreatment and biological treatment is greater than 95 percent.
- Nitrification in the biological treatment was clearly established, however, the bench-scale test was not planned or configured to operate for the length of time to fully acclimate the biomass and achieve stable nitrification.

2. *Select the approach for phenol degradation and nitrification.*

   - A single batch reactor can be configured to achieve phenol degradation
   - It is believed that a single batch reactor can be configured to achieve stable nitrification.

3. *Determine the kinetic parameters to be used in design of the full-scale groundwater treatment system.*

   - Nitrification is the process that will determine design kinetics and full-scale design parameters. As identified above, compete nitrification was not achieved as the treatability study was not operated long enough to achieve the solids residence time necessary for stable conversion of ammonia to nitrate.

7.0 SUMMARY AND CONCLUSIONS

7.1 E AND E/R UNIT OPERATION

Section 7.0 of the Work Plan (May 23, 2000) set forth several hydrogeological data analysis goals. Chemical data collected prior to and during operation of the E and E/R Units are to be assessed to address several design issues. These design issues are reiterated below followed by a brief explanation on how the issues were addressed by the Pilot Project.

Evaluate geophysical profiles for comparison with monitoring well nest data to determine the usefulness of these profiles for full-scale vertical characterization of groundwater.

- The stratified distribution of contaminants at the Site observed during the RI was confirmed by the Pilot Project analytical data. The initial concentrations of the analytes were highest in the groundwater samples collected from the deepest monitoring wells and were significantly lower in groundwater samples collected from the wells screened at higher elevations. These data indicate that the bulk of the contaminant mass lies in the lower few feet of the aquifer.
- The UVF data were not useful for characterizing vertical groundwater quality. These data indicate that the contaminants present do not fluoresce to UVF. Therefore, UVF does not appear to be an effective screening tool for the contaminants at the Site.
- Results from the EC monitoring logs indicate that the elevated concentrations of salts present in the lower portion of the upper sand unit are detectable using CPT/EC. Consistent with the contaminant concentration data, EC response increased with depth in the aquifer. Therefore, EC may be useful as a screening tool for development of a vertical profile of groundwater contamination. EC would need to be used in conjunction with limited confirmational vertical aquifer sampling to determine vertical concentration profiles.

2. *Analyze a series of time versus concentration plots of the groundwater analytical data to estimate contaminant mass removal, concentration decay rates and removal limitations under full-scale operation.*

- The contaminant mass removal rate in the E Unit decreased significantly over time. This is attributed to the stepping down of groundwater pumping rates and vertical mixing of groundwater during the first operational period.

- Analyte concentrations were observed to decrease in E Unit extracted water during the first week of operation.
- Although a portion of the initial contaminant mass removal in the E/R Unit is attributable to the drawdown effect, the reinjection effect acts to depress contaminant concentrations further through the flushing of clean water through the treatment area. The reinjection effect prevents groundwater from outside the treatment cell from entering the cell and re-contaminating the treatment zone. The drawdown and reinjection effects work in tandem in the E/R Unit to depress contaminant concentrations and to minimize recontamination of the treatment zone resulting in more efficient operation.
- E/R Unit data indicate that mass removal efficiency was greatest during the early portion of the test. However, as the test progressed, less mass was removed per unit of operating time.
- Between 1.5 and 4.5 pore volumes were purged from the treatment zone in the E/R Unit to attain effective mass removal.

3. *Evaluate the effects of reinjection through comparison of time series plots of groundwater analytical data.*

- Downward concentration trends were noted in groundwater samples collected from monitoring wells screened at higher elevations in both the E Unit and the E/R Unit.
- The analytical data from well nest WN-3 in the E Unit demonstrated no significant downward concentration trends in the most contaminated zones indicating that groundwater pumping alone had no effect on the concentrations of contaminants in the aquifer. This is the result of an effectively unlimited source of contaminants under the conditions of the study. This contrasts with the E/R Unit where the reinjection effect prevents groundwater from outside the test cell from entering and re-contaminating the remediation zone.
- In contrast to the well nest analytical data in the E Unit, the contaminant concentrations in the E/R Unit well nests exhibited significant downward trends during Phase I of E/R Unit operation. These data demonstrate that the reinjection effect was more efficient at lowering the contaminant concentrations throughout the test cell. The reinjection effect acts to reduce contaminant concentrations through the flushing of injected water through the treatment area. The reinjection effect also prevents contaminated groundwater from outside the treatment cell from entering the cell and

re-contaminating the treatment zone resulting in more efficient operation. Based upon the much higher starting concentrations and the lower final concentrations, the E/R Unit is more efficient at reducing the contaminant concentrations in the aquifer.

- E/R Unit monitoring well concentration trend data demonstrated reinjection reduced the contaminant concentrations in the zone of highest contamination in the shallow aquifer over a relatively short operating period. This indicates that groundwater removal was focused on the lower portion of the shallow aquifer where the bulk of the contaminant mass is present.

4. *Determine the impact of variation of groundwater extraction rates.*

   - The E Unit monitoring well analytical data demonstrated that variation of groundwater pumping rates had no effect on the concentrations of contaminants in the aquifer.

5. *Evaluate the impact of cyclical versus continuous groundwater extraction.*

   - There was no demonstrable effect as a result of cyclical operation of the E Unit suggesting that cyclical operation would not enhance contaminant recovery.

6. *Estimate the effects of adsorption/desorption during intermittent operation of the E Unit and post-extraction groundwater sampling.*

   - In general, there was no significant rebound of contaminant concentrations in the E Unit during the post-extraction period in the E Unit.
   - There was no demonstrable effect from the cyclical operation of the E Unit.
   - There was no significant rebound of contaminant concentrations during the post-extraction period in the E/R Unit.

In addition to the conclusions summarized above, the following conclusions were derived from evaluation of the bromide tracer data, which were obtained under conditions of unbalanced reinjection.

- The bromide tracer test provided sufficient information from which to determine groundwater flow paths, estimate aquifer hydraulic parameters, and gauge test cell performance.
- The bromide tracer data for groundwater samples collected from well nest WN-1 indicated that the primary bromide flow path was through the lowermost portion of

the shallow aquifer. The bromide tracer passed through the shallow aquifer at elevations below the screened interval of monitoring well WN-1B. These data suggest that the primary zone of groundwater removal occurred below the elevation of the screened interval of monitoring well WN-1B. However, the bulk of the bromide tracer passed through the lowermost 5 feet of the shallow aquifer where the highest concentrations of contaminants are present. These data indicate that groundwater removal was focused on this deeper zone were the bulk of the contaminant mass resides.

- The average hydraulic conductivity value calculated from the tracer test correlate well with the hydraulic conductivity values calculated from response tests. The geometric mean hydraulic conductivity value from the response tests conducted prior to the Pilot Project and the geometric mean hydraulic conductivity value calculated during the RI for the deep wells that intersect the gravelly were both at 5.4 feet/day.
- The hydraulic conductivity value used to design the Pilot Project was 30 feet/day. However, the data generated from response testing and the bromide tracer study suggest that the hydraulic conductivity of the shallow aquifer lies closer to 10 feet/day. The implications of the aquifer hydraulic conductivity must be considered to optimize full-scale system design. This would include groundwater modeling to assess the effects of hydraulic conductivity and aquifer gradients on optimal well spacing, screened intervals, pumping rates, and length of operation.

7.2 EXTRACTED WATER TREATABILITY STUDY

Section 7.2 of the Work Plan (May 23, 2000) presents three data analysis goals. Data collected during the bench-scale treatment operation are to be used to address these goals. The goals are paraphrased below followed by a brief explanation on how the goals were addressed in the treatability study.

1. *Determine the removal efficiency for arsenic, phenols, cyanide, and thiocyanate and the nitrification (ammonia conversion to nitrate) efficiency.*

    - Arsenic removal in chemical oxidation pretreatment is generally 80 to 90 percent.
    - Cyanide removal is not a treatment issue at the WCP Site due to the low concentrations in untreated groundwater (extracted water concentrations reduced to less than MCL after pumping).

- Phenolics removal in combined pretreatment and biological treatment is greater than 99 percent.
- Thiocyanate removal in combined pretreatment and biological treatment is greater than 95 percent.
- Nitrification in the biological treatment was clearly established, however, the bench-scale test was not planned or configured to operate for the length of time to fully acclimate the biomass and achieve stable nitrification.

2. *Select the approach for phenol degradation and nitrification.*

   - A single batch reactor can be configured to achieve phenol degradation
   - It is believed that a single batch reactor can be configured to achieve stable nitrification.

3. *Determine the kinetic parameters to be used in design of the full-scale groundwater treatment system.*

   - Nitrification is the process that will determine design kinetics and full-scale design parameters. As identified above, compete nitrification was not achieved as the treatability study was not operated long enough to achieve the solids residence time necessary for stable conversion of ammonia to nitrate.

8.0 RECOMMENDATIONS

Groundwater Extraction/Reinjection

The concepts and principles underlying cell based groundwater extraction and reinjection have been confirmed. Scale up requires development of a detailed three-dimensional computer model to optimize well spacing, extraction/injection rates and cell sequencing. It is recommended that detailed computer modeling be conducted co-incident with the final definition of the Phase I groundwater remediation area. Results of this modeling will also define hydraulic capacity requirements of groundwater treatment and appropriate average, long-term influent concentrations.

Groundwater Treatability

Target parameter removal was excellent during the treatability study. Nitrification was achieved but could not be completed within the planning and design parameters of the bench-scale study completed. Nitrification works but the parameters required for successful scale up were not defined. It is recommended that a followup bench-scale system be operated to address the following:

a) longer acclimatization and operation period so that stable biological treatment is achieved;

b) parallel operation of biological treatment processes with and without arsenic pretreatment to monitor the fate of arsenic in the process .

c) representative influent concentrations as opposed to the startup concentrations used in the Pilot Project Treatability Study. Representative, long-term, average influent concentrations will be determined from groundwater modeling.

9.0 REFERENCES

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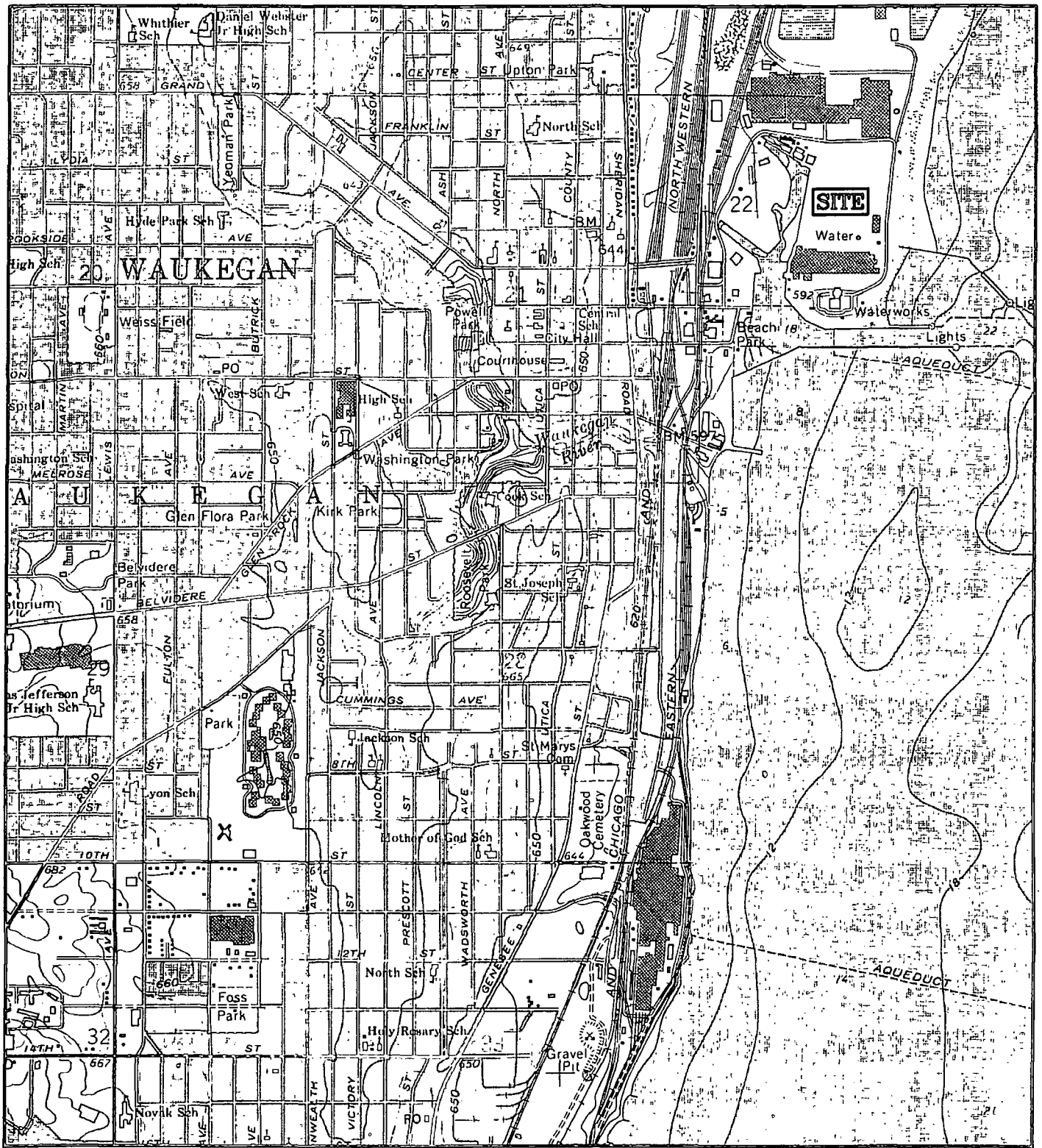


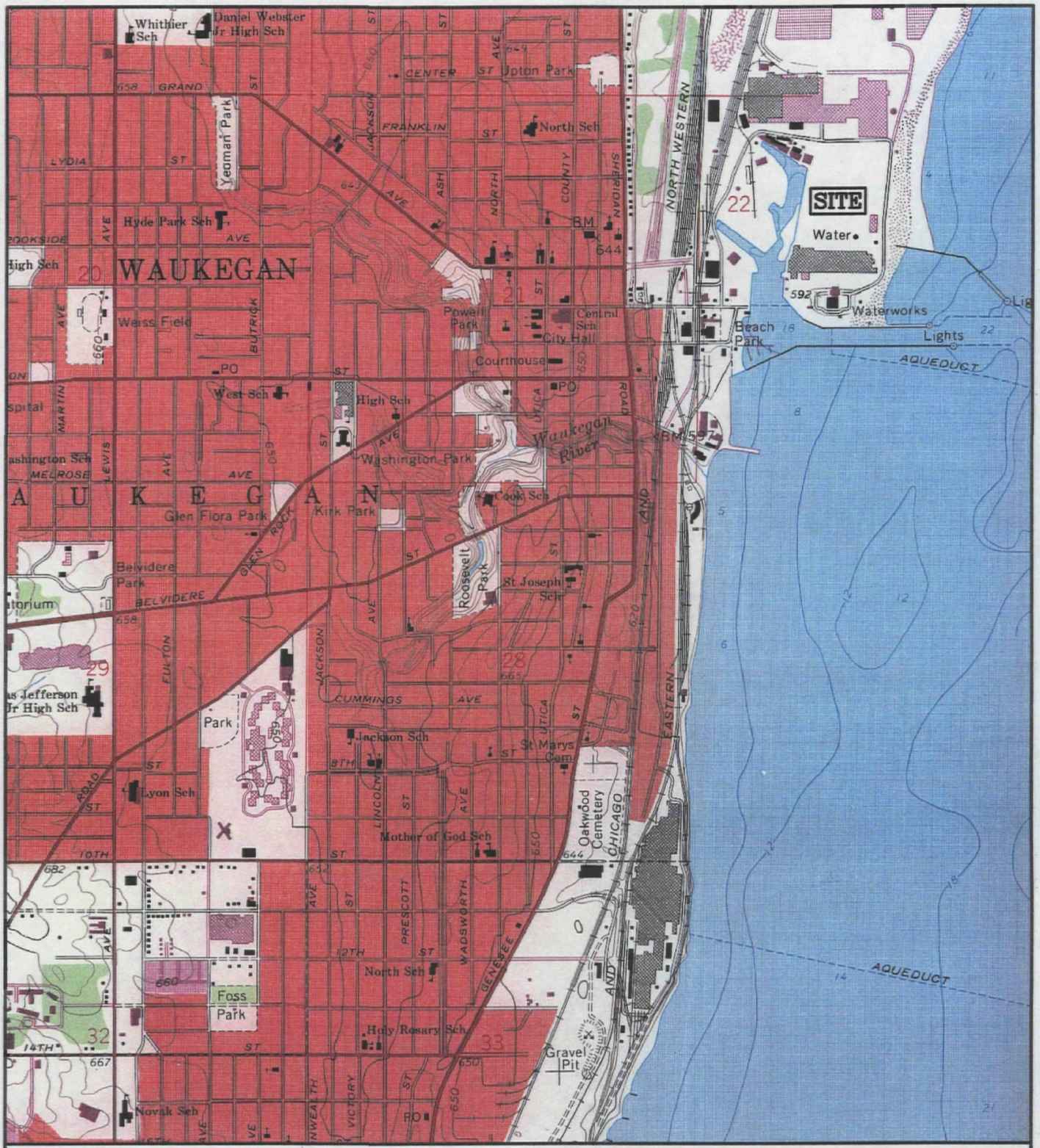
BASE SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE; WAUKEGAN, ILLINOIS 1960

figure 1.1

SITE LOCATION
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
Waukegan, Illinois

CRA

15670-00(006)GN-CO001 MAR 21/2001



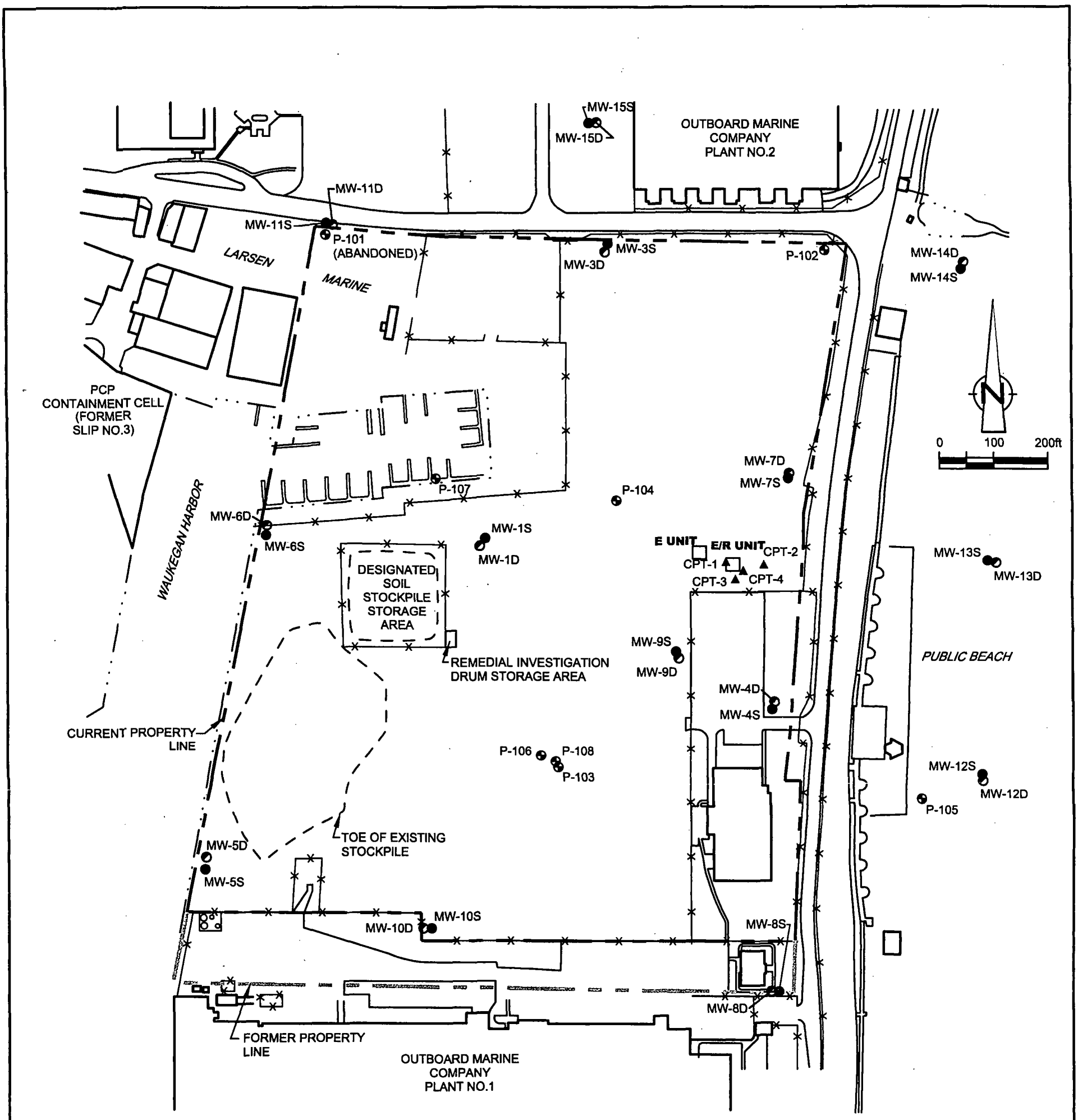
BASE SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE; WAUKEGAN, ILLINOIS 1960

figure 1.1

SITE LOCATION
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
Waukegan, Illinois

CRA

15670-00(006)GN-CO001 MAR 21/2001



LEGEND:

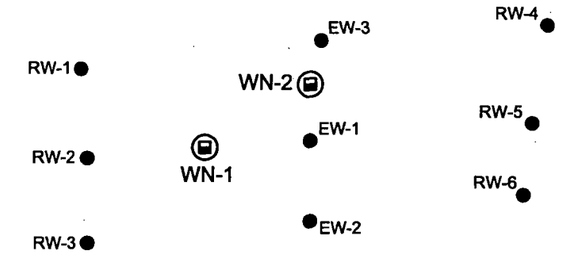
MW-10S ●	SHALLOW MONITORING WELL LOCATION AND IDENTIFIER
MW-10D ◐	DEEP MONITORING WELL LOCATION AND IDENTIFIER
P-102 ⊕	PIEZOMETER LOCATION AND IDENTIFIER
E/R UNIT □	PILOT PROJECT TEST UNIT LOCATION AND IDENTIFIER
CPT-1 ▲	CONE PENETROMETER SOUNDING LOCATION AND IDENTIFIER

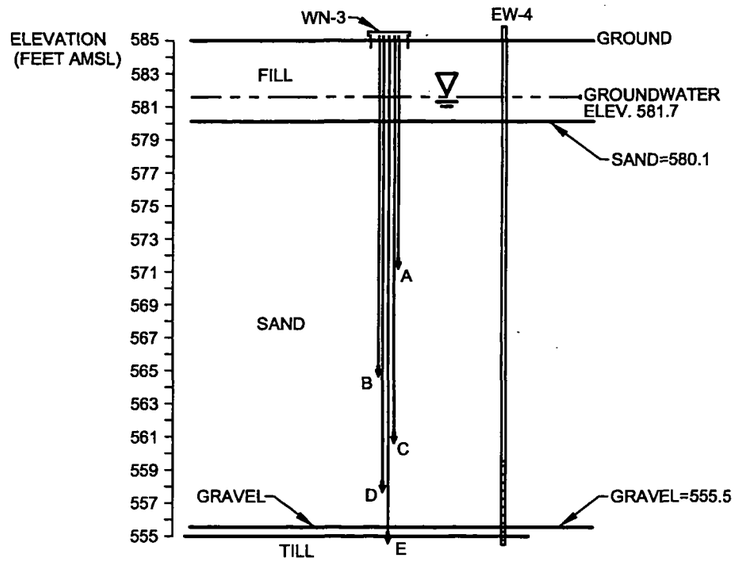
figure 1.2

SITE PLAN AND PILOT PROJECT TEST UNIT LOCATIONS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
Waukegan, Illinois

CRA

15670-00(006)GN-CO002 MAR 21/2001





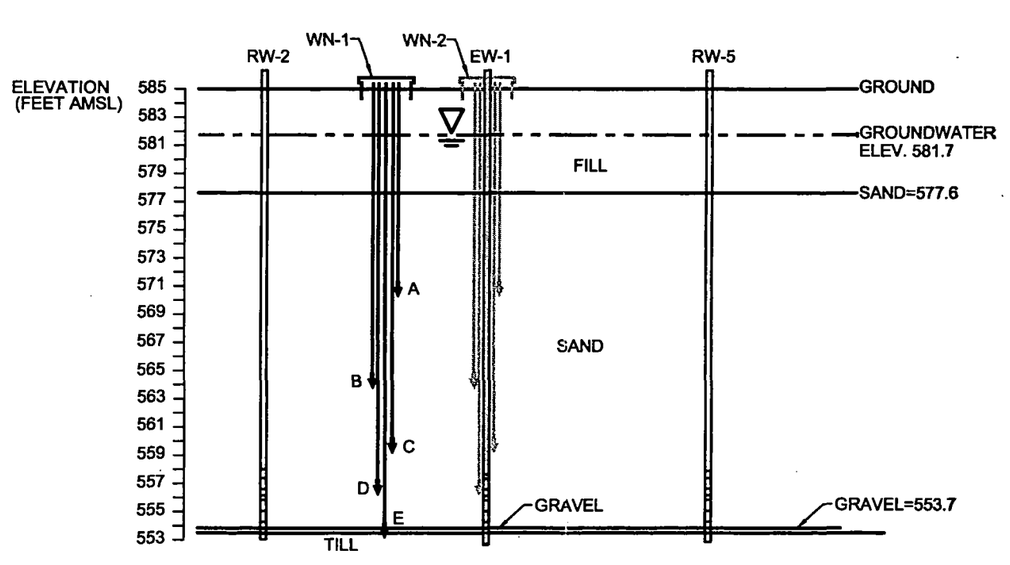


figure 3.1

HORIZONTAL SCALE= 1"-7'

EXTRACTION, REINJECTION, AND MONITORING WELL NEST LOCATIONS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
Waukegan, Illinois

CRA

15670-00(006)GN-CO003 MAR 21/2001

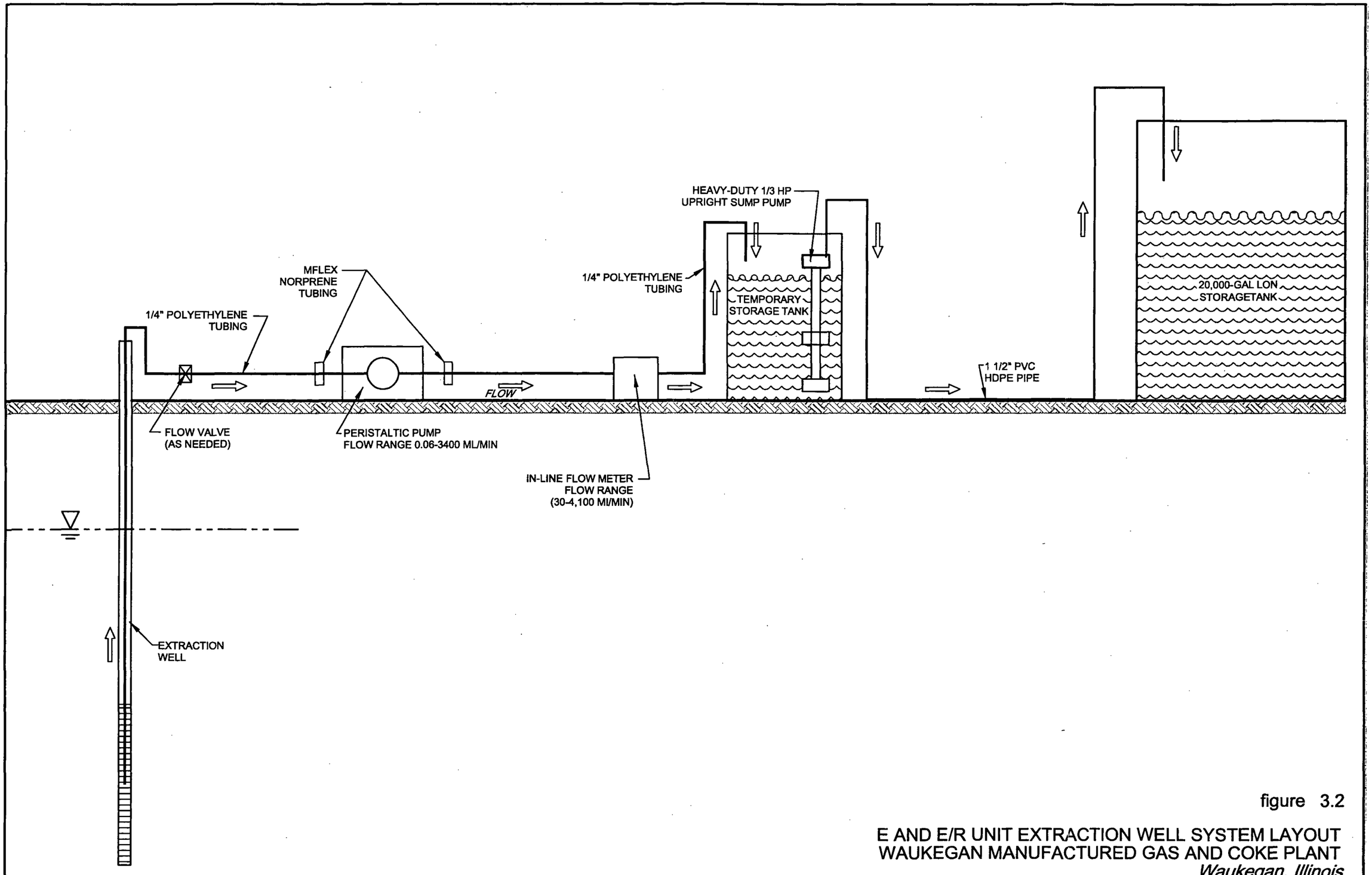
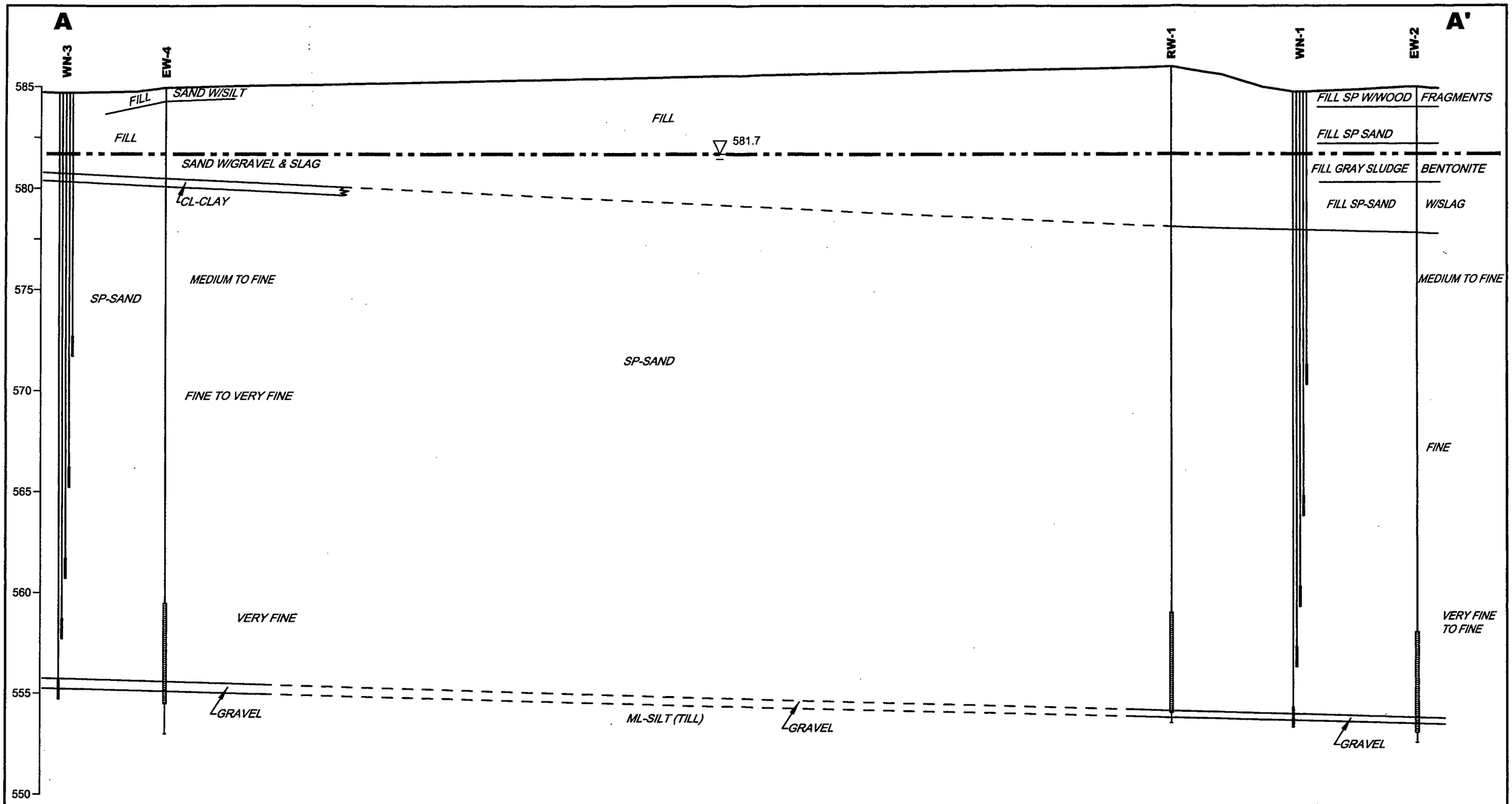


figure 3.2

E AND E/R UNIT EXTRACTION WELL SYSTEM LAYOUT
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
Waukegan, Illinois

CRA

15670-00(006)GN-CO007 MAR 21/2001



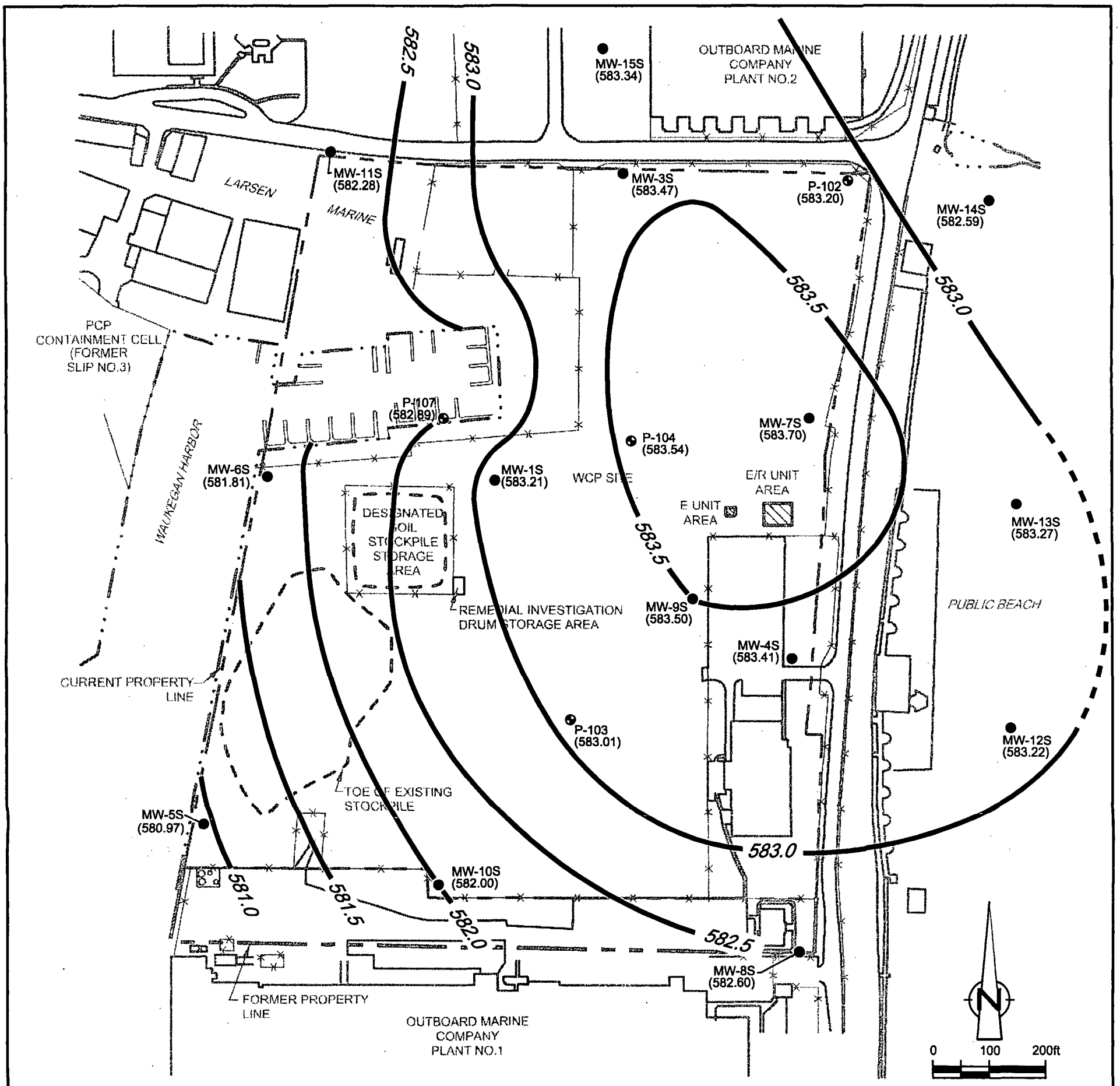
NOTE:

SEE FIGURE 3.1 FOR CROSS-SECTION LOCATION

SCALE: HORIZ. 1"=60'
VERT. 1"=5'

figure 4.1

GEOLOGIC CROSS-SECTION A-A'
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
Waukegan, Illinois



LEGEND:

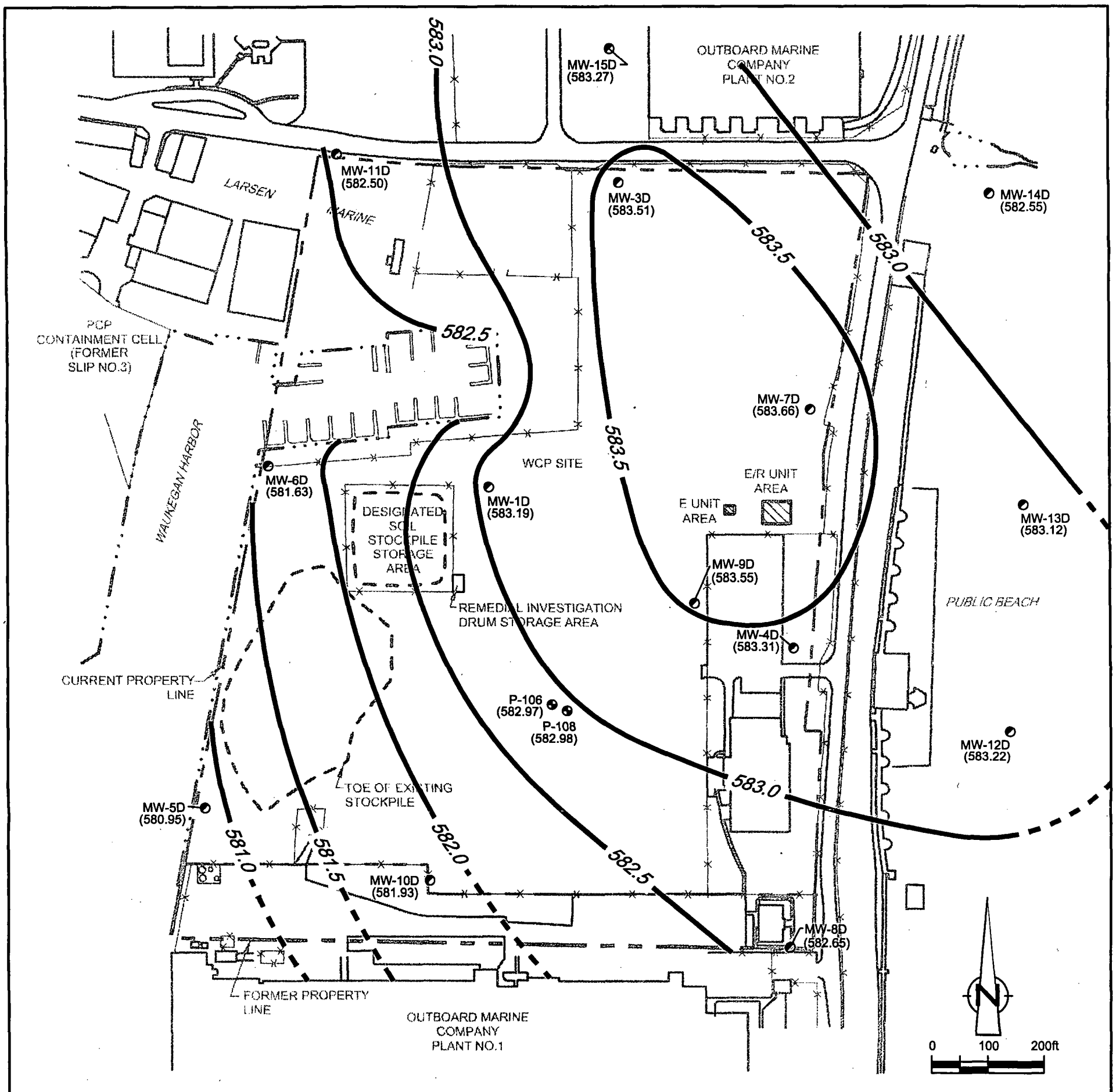
MW-10S ●	SHALLOW MONITORING WELL LOCATION AND IDENTIFIER
P-102 ⊕	PIEZOMETER LOCATION AND IDENTIFIER
(582.00)	GROUNDWATER ELEVATION (FEET AMSL)
▬▬	GROUNDWATER CONTOUR

figure 4.2

GROUNDWATER CONTOURS-SHALLOW MONITORING WELLS AND PIEZOMETERS
JULY 11, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
Waukegan, Illinois

CRA

15670-00(006)GN-CO005 MAR 21/2001



LEGEND:

MW-10D ◐	DEEP MONITORING WELL LOCATION AND IDENTIFIER
P-106 ◔	PIEZOMETER LOCATION AND IDENTIFIER
(581.93)	GROUNDWATER ELEVATION (FEET AMSL)
———	GROUNDWATER CONTOUR

figure 4.3

GROUNDWATER CONTOURS-DEEP MONITORING WELLS AND PIEZOMETERS
JULY 11, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
Waukegan, Illinois

CRA

15670-00(006)GN-CO006 MAR 21/2001

TABLE 3.1

SUMMARY OF EXTRACTION, REINJECTION, AND MONITORING WELL CONSTRUCTION DETAILS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	Ground Surface Elevation (ft AMSL) [1]	Bottom of Boring Depth (ft BGS) [2]	Bottom of Boring Elevation (ft AMSL)	Screened Interval From Depth (ft BGS)	Screened Interval To Depth (ft BGS)	Screened Interval From Elevation (ft AMSL)	Screened Interval To Elevation (ft AMSL)	Date Completed
E/R Unit								
Extraction Wells								
EW-1	584.7	32.5	552.2	32.0	27.0	552.7	557.7	8/3/00
EW-2	585.0	32.5	552.5	32.0	27.0	553.0	558.0	8/2/00
EW-3	584.8	32.5	552.3	32.0	27.0	552.8	557.8	8/4/00
Reinjection Wells								
RW-1	585.1	33.0	552.1	32.0	27.0	553.1	558.1	8/8/00
RW-2	585.0	33.0	552.0	32.0	27.0	555.0	558.0	8/8/00
RW-3	585.0	33.0	552.0	32.0	27.0	555.0	558.0	8/8/00
RW-4	584.7	33.0	551.7	32.0	27.0	552.7	557.7	8/8/00
RW-5	584.9	33.0	551.9	32.0	27.0	552.9	557.9	8/8/00
RW-6	585.0	33.0	552.0	32.0	27.0	553.0	558.0	8/8/00
Monitoring Wells								
WN-1A	584.8	32.0	552.8	13.5	14.5	571.3	570.3	8/4/00
WN-1B	584.8	32.0	552.8	20.0	21.0	564.8	563.8	8/4/00
WN-1C	584.8	32.0	552.8	24.5	25.5	560.3	559.3	8/4/00
WN-1D	584.8	32.0	552.8	27.5	28.5	557.3	556.3	8/4/00
WN-1E	584.8	32.0	552.8	30.5	31.5	554.3	553.3	8/4/00
WN-2A	584.7	32.0	552.8	13.5	14.5	571.2	570.2	8/3/00
WN-2B	584.7	32.0	552.8	20.0	21.0	648.7	563.7	8/3/00
WN-2C	584.7	32.0	552.8	24.5	25.5	560.2	559.2	8/3/00
WN-2D	584.7	32.0	552.8	27.5	28.5	557.2	556.2	8/3/00
WN-2E	584.7	32.0	552.8	30.5	31.5	554.2	553.2	8/3/00
E Unit								
Extraction Wells								
EW-4	585.0	32.0	553.0	30.5	25.5	554.5	559.5	8/2/00

TABLE 3.1

SUMMARY OF EXTRACTION, REINJECTION, AND MONITORING WELL CONSTRUCTION DETAILS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	Ground Surface Elevation (ft AMSL) [1]	Bottom of Boring Depth (ft BGS) [2]	Bottom of Boring Elevation (ft AMSL)	Screened Interval From Depth (ft BGS)	Screened Interval To Depth (ft BGS)	Screened Interval From Elevation (ft AMSL)	Screened Interval To Elevation (ft AMSL)	Date Completed
Monitoring Wells								
WN-3A	584.7	32.0	552.7	12.0	13.0	572.7	571.7	8/7/00
WN-3B	584.7	32.0	552.7	18.5	19.5	566.2	565.2	8/7/00
WN-3C	584.7	32.0	552.7	23.0	24.0	561.7	560.7	8/7/00
WN-3D	584.7	32.0	552.7	26.0	27.0	558.7	557.7	8/7/00
WN-3E	584.7	32.0	552.7	29.0	30.0	555.7	554.7	8/7/00

[1] ft AMSL - feet above mean sea level
[2] ft BGS - feet below ground surface

TABLE 3.2

SUMMARY OF EXTRACTION AND REINJECTION WELL DEVELOPMENT PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	*Development Date*	*Water Level (feet btoc)* [1]	*Total Depth (feet btoc)*	*Volume Removed (gallons)*	*pH (standard units)*	*Conductivity (µS/cm)* [2]	*Turbidity (NTU)* [3]	*Temp. (°C)* [4]	*Appearance*	*Total Depth After Development (ft btoc)*
RW - 1	8/17/00	5.69	34.07	5	8.45	1118	>999	13.5	Very Cloudy, Black	32.41
				10	8.71	1423	>999	12.9	Very Cloudy, Black	
				15	8.79	1511	>999	12.7	Very Cloudy, Black	
				20	8.83	1568	>999	12.7	Very Cloudy, Black	
				25	8.84	1638	>999	12.6	Very Cloudy, Black	
				30	8.85	1730	>999	12.7	Very Cloudy, Black	
				35	8.89	1599	71.1	12.6	Dark Brown	
				40	8.90	1605	49.4	12.4	Brown	
				45	8.90	1568	39.7	12.5	Brown	
Because total well depth was less after development, the well was redeveloped on 8/18/00 with a surge block and an additional 12 gallons of water was purged.										34.35
RW - 2	8/17/00	5.71	34.72	5	8.46	1074	>999	12.7	Very Cloudy, Black	34.95
				10	8.60	1131	>999	12.9	Very Cloudy, Black	
				15	8.71	1247	>999	12.5	Very Cloudy, Black	
				20	8.78	1288	>999	12.5	Very Cloudy, Black	
				25	8.85	1325	826	12.4	Dark Brown	
				30	8.89	1408	110	12.4	Brown	
				35	8.90	1437	54.6	12.6	Brown	
				40	8.91	1446	49.6	12.7	Light Brown	
				45	8.92	1472	30.5	12.6	Light Brown	
RW - 3	8/17/00	5.77	34.69	5	8.49	1064	>999	12.6	Very Cloudy, Black	34.73
				10	8.64	1155	>999	12.4	Very Cloudy, Black	
				15	8.76	1300	>999	12.5	Very Cloudy, Black	
				20	8.82	1381	>999	12.6	Very Cloudy, Black	
				25	8.84	1419	>999	12.6	Very Cloudy, Black	
				30	8.88	1435	112	12.7	Dark Brown	
				35	8.90	1481	48.2	12.5	Dark Brown	
				40	8.90	1463	37.2	12.4	Brown	
				45	8.90	1508	42.7	12.5	Brown	

TABLE 3.2

SUMMARY OF EXTRACTION AND REINJECTION WELL DEVELOPMENT PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	*Development Date*	*Water Level (feet btoc)*[1]	*Total Depth (feet btoc)*	*Volume Removed (gallons)*	*pH (standard units)*	*Conductivity (µS/cm)*[2]	*Turbidity (NTU)*[3]	*Temp. (°C)*[4]	*Appearance*	*Total Depth After Development (ft btoc)*
RW - 4	8/17/00	5.59	33.88	5	8.28	499	>999	17.6	Black Silty	34.32
				10	8.76	694	>999	14.6	Black Silty	
				15	8.85	850	550	13.8	Dark Brown	
				20	8.87	971	350	13.4	Dark Brown	
				25	8.88	1047	107	13	Medium Brown	
				30	8.89	1094	65.2	12.8	Medium Brown	
				35	8.89	1116	51.3	12.6	Medium Brown	
				40	8.89	1141	45.5	12.5	Medium Brown	
				45	8.89	1151	41.2	12.5	Light Brown	
RW - 5	8/17/00	5.8	34.45	5	8.39	695	>999	18.7	Black Silty	34.58
				10	8.72	753	>999	15.5	Black Silty	
				15	8.83	840	400	14.4	Medium Gray	
				20	8.87	1009	250	13.7	Medium Brown	
				25	8.88	905	160	13.4	Light Brown	
				30	8.89	1074	80	13.1	Light Brown	
				35	8.89	1221	50	12.8	Light Brown	
				40	8.89	1224	37	12.8	Light Brown	
				45	8.89	1227	34	12.8	Light Brown	
				50	8.89	1286	30	12.8	Light Brown	
RW - 6	8/17/00	5.79	34.45	5	8.40	876	>999	17.9	Black Silty	34.5
				10	8.62	922	>999	14.9	Black Silty	
				15	8.76	926	550	13.9	Black Silty	
				20	8.80	863	260	12.9	Brownish - Black	
				25	8.85	1180	180	12.7	Brownish - Black	
				30	8.85	1191	120	12.5	Medium Brown	

TABLE 3.2

SUMMARY OF EXTRACTION AND REINJECTION WELL DEVELOPMENT PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	*Development Date*	*Water Level (feet btoc)* [1]	*Total Depth (feet btoc)*	*Volume Removed (gallons)*	*pH (standard units)*	*Conductivity (µS/cm)* [2]	*Turbidity (NTU)* [3]	*Temp. (°C)* [4]	*Appearance*	*Total Depth After Development (ft btoc)*
				35	8.86	1225	100	12.4	Light Brown	
EW - 1	8/17/00	5.52	33.23	5	8.73	1460	>999	12.8	Black Silty	34
				10	8.80	1210	>999	12.8	Black Silty	
				15	8.84	1413	>999	12.7	Black Silty	
				20	8.86	1530	484	12.8	Black Silty	
				25	8.86	1560	551	12.7	Black w/Heavy Silt	
				30	8.88	1546	141	12.6	Dark Brown	
				35	8.88	1548	40.7	12.5	Medium Brown	
				40	8.88	1562	18	12.6	Light Brown	
				45	8.87	1566	15.1	12.6	Light Brown	
EW - 2	8/17/00	5.85	33.65	5	8.41	826	>999	12.8	Black Silty	32.68
				10	8.58	966	>999	12.6	Black Silty	
				15	8.69	1125	>999	12.5	Black Silty	
				20	8.77	1179	>999	12.5	Black Silty	
				25	8.76	1104	>999	12.6	Black Silty	
				30	8.79	1168	308	12.5	Gray - Dark Brown	
				35	8.80	1154	88.2	12.5	Gray - Dark Brown	
				40	8.81	1163	54.2	12.6	Medium Brown	
				45	8.82	1173	45.6	12.6	Medium Brown	
Because total well depth was less after development, the well was redeveloped on 8/18/00 with a surge block and an additional 12 gallons of water was purged.										34.52
EW - 3	8/17/00	5.68	34.35	5	8.48	1074	>999	12.7	Black Silty	35.78
				10	8.63	1094	895	12.6	Black Silty	
				15	8.75	1002	589	12.6	Gray - Dark Brown	
				20	8.84	1229	356	12.6	Gray - Dark Brown	
				25	8.86	1197	84.4	12.6	Dark Brown	
				30	8.86	1165	76.1	12.5	Dark Brown	
				35	8.89	1276	57.3	12.5	Medium Brown	
				40	8.89	1300	39.6	12.4	Medium Brown	

TABLE 3.2

SUMMARY OF EXTRACTION AND REINJECTION WELL DEVELOPMENT PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	*Development Date*	*Water Level (feet btoc)* [1]	*Total Depth (feet btoc)*	*Volume Removed (gallons)*	*pH (standard units)*	*Conductivity (µS/cm)* [2]	*Turbidity (NTU)* [3]	*Temp. (°C)* [4]	*Appearance*	*Total Depth After Development (ft btoc)*
				45	8.90	1322	42.9	12.4	Medium Brown	
EW - 4	8/17/00	5.54	32.19	5	8.65	1070	>999	12.6	Very Cloudy, Black	32.5
				10	8.77	1138	>999	12.6	Very Cloudy, Black	
				15	8.82	1112	>999	12.5	Very Cloudy, Black	
				20	8.87	979	>999	12.6	Very Cloudy, Black	
				25	8.90	1111	>999	12.5	Very Cloudy, Black	
				30	8.92	1030	142	12.6	Brown	
				35	8.94	1009	51.6	12.4	Brown	
				40	8.95	1032	37.9	12.4	Light Brown	
				45	8.95	1053	28.5	12.4	Light Brown	

[1] ft BTOC - feet below top of casing
[2] (µS/cm) - microsiemens per centimeter
[3] (NTU) - neophenolic turbidity units
[4] (°C) - degrees Celsius

TABLE 3.3

MONITORING WELL NEST DEVELOPMENT PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	*Date Completed*	*Water Level (feet btoc)* [1]	*Total Depth (feet btoc)*	*Volume Removed (liters)*	*pH (standard units)*	*Conductivity (µS/cm)* [2]	*Turbidity (NTU)* [3]	*Temp. (°C)* [4]	*Appearance*
WN - 1A	8/18/00	5.47	16.70	1	7.18	281	>999	16.0	Black and Silty
				2	7.18	297	>999	15.1	Black and Silty
				3	7.22	300	>999	15.0	Black and Silty
				4	7.26	303	>999	15.0	Black and Silty
				5	7.31	289	>999	14.9	Black and Silty
				6	7.37	315	>999	14.9	Black and Silty
				7	7.44	253	>999	14.8	Dark Gray
				8	7.51	321	831	14.8	Dark Gray
				9	7.52	293	433	15.5	Medium Gray
				10	7.55	332	351	14.7	Medium Gray
				11	7.61	327	223	14.9	Medium Gray
WN - 1B	8/18/00	5.55	23.04	1	7.71	251	>999	14.6	Black and Silty
				2	7.46	280	>999	13.8	Black and Silty
				3	7.46	281	>999	13.6	Black and Silty
				4	7.45	276	644	13.5	Dark Gray
				5	7.47	281	460	13.5	Dark Gray
				6	7.52	286	254	13.6	Dark Gray
				7	7.56	289	204	13.6	Medium Gray
				8	7.62	289	143	13.7	Light Gray
WN - 1C	8/18/00	5.49	27.75	1	8.06	864	>999	14.6	Black and Silty
				2	7.69	312	>999	13.8	Black and Silty
				3	7.79	314	726	13.6	Gray
				4	7.92	315	488	13.5	Gray
				5	7.97	327	260	13.4	Light Gray
				6	8.02	325	187	13.3	Light Gray
				7	8.07	338	124	13.3	Light Gray
				8	8.11	347	97.1	13.3	Light Gray

TABLE 3.3

MONITORING WELL NEST DEVELOPMENT PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	*Date Completed*	*Water Level (feet btoc)* [1]	*Total Depth (feet btoc)*	*Volume Removed (liters)*	*pH (standard units)*	*Conductivity (µS/cm)* [2]	*Turbidity (NTU)* [3]	*Temp. (°C)* [4]	*Appearance*
WN - 1D	8/18/00	5.43	30.54	1	8.68	870	>999	14.8	Very Cloudy, Black
				2	8.52	993	168	14.1	Medium Brown
				3	8.53	1000	124	13.8	Medium Brown
				4	8.55	1006	113	13.7	Medium Brown
				5	8.56	1001	101.9	13.7	Medium Brown
				6	8.57	988	76.4	13.7	Light Brown
				7	8.58	993	48.8	13.7	Light Brown
				8	8.59	977	48.6	13.7	Light Brown
WN - 1E	8/18/00	5.42	33.76	1	8.68	1287	>999	20.8	Very Cloudy, Black
				2	8.73	1445	>999	17.2	Dark Brown
				3	8.72	1476	415	16.3	Brown-Cloudy
				4	8.72	1490	262	15.3	Brown-Cloudy
				5	8.72	1504	216	15.0	Brown-Cloudy
				6	8.72	1509	187	14.7	Brown-Slightly cloudy
				7	8.72	1516	136	14.5	Brown Tint
				8	8.72	1520	123	14.3	Brown Tint
WN - 2A	8/18/00	5.15	16.64	1	8.00	205	>999	15.2	Black and Silty
				2	7.77	231	>999	14.4	Black and Silty
				3	7.68	233	922	14.2	Black and Silty
				4	7.62	229	422	14.0	Medium Gray
				5	7.56	221	191	13.8	Light Gray
				6	7.53	214	114	13.7	Light Gray
				7	7.50	210	70.6	13.8	Slightly Cloudy
				8	7.49	206	45.6	13.9	Slightly Cloudy

TABLE 3.3

MONITORING WELL NEST DEVELOPMENT PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	*Date Completed*	*Water Level (feet btoc)* [1]	*Total Depth (feet btoc)*	*Volume Removed (liters)*	*pH (standard units)*	*Conductivity (µS/cm)* [2]	*Turbidity (NTU)* [3]	*Temp. (°C)* [4]	*Appearance*
WN - 2B	8/18/00	5.18	23.20	1	7.97	295	>999	15.1	Black and Silty
				2	7.95	315	>999	15.4	Black and Silty
				3	7.92	310	877	14.6	Dark Gray
				4	7.94	309	211	14.2	Medium Gray
				5	7.95	307	109.7	14.0	Light Gray
				6	7.97	309	66	13.9	Slightly Cloudy
				7	7.99	312	56.9	13.8	Slightly Cloudy
				8	8.00	313	36	13.8	Slightly Cloudy
WN - 2C	8/18/00	5.25	27.70	1	7.97	370	>999	15.0	Black and Silty
				2	7.85	276	>999	14.1	Black and Silty
				3	7.95	419	568	13.7	Dark Gray
				4	8.00	406	182	13.5	Medium Brown
				5	8.02	440	128	13.6	Light Brown
				6	8.03	442	80.9	13.6	Light Brown
				7	8.04	438	49.8	13.5	Light Brown
				8	8.05	428	43.7	13.6	Light Brown
WN - 2D	8/18/00	5.23	30.60	1	8.06	759	>999	14.4	Black and Silty
				2	8.03	859	>999	13.9	Black and Silty
				3	8.18	893	641	13.5	Dark Gray
				4	8.23	831	328	13.5	Medium Gray
				5	8.30	954	192	13.2	Medium Gray
				6	8.34	923	120	13.3	Medium Gray
				7	8.38	928	105.5	13.2	Medium Gray
				8	8.40	951	71.4	13.2	Light Brown

TABLE 3.3

MONITORING WELL NEST DEVELOPMENT PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	*Date Completed*	*Water Level (feet btoc)* [1]	*Total Depth (feet btoc)*	*Volume Removed (liters)*	*pH (standard units)*	*Conductivity (µS/cm)* [2]	*Turbidity (NTU)* [3]	*Temp. (°C)* [4]	*Appearance*
WN - 2E	8/18/00	5.40	32.93	1	8.71	779	>999	16.1	Black and Silty
				2	8.76	1045	>999	14.8	Black and Silty
				3	8.76	1468	754	14.2	Dark Brown
				4	8.77	1293	126	14.0	Medium Brown
				5	8.78	841	75.9	13.8	Medium Brown
				6	8.79	996	35.4	13.8	Light Brown
				7	8.79	1094	31.9	13.6	Light Brown
				8	8.79	1107	31.5	13.6	Light Brown
WN - 3A	8/18/00	5.67	15.25	1	7.45	1732	>999	16.0	Black and Silty
				2	7.20	1804	>999	15.4	Black and Silty
				3	7.18	1838	>999	15.1	Black and Silty
				4	7.21	1835	>999	15.1	Black and Silty
				5	7.24	1860	>999	15.0	Black and Silty
				6	7.26	1848	>999	15.0	Black and Silty
				7	7.26	1865	>999	14.9	Black and Silty
				8	7.30	1863	>999	14.9	Black and Silty
				9	7.32	1861	>999	14.9	Black and Silty
				10	7.35	1853	>999	14.9	Black and Silty
				11	7.37	1855	885	14.8	Dark Gray
WN - 3B	8/18/00	5.58	21.71	1	8.16	258	>999	15.6	Black and Silty
				2	8.04	300	>999	14.8	Black and Silty
				3	8.12	323	>999	14.3	Black and Silty
				4	8.14	326	>999	14.2	Black and Silty
				5	8.16	326	>999	14.0	Black and Silty
				6	8.17	326	704	14.0	Dark Gray
				7	8.18	324	627	13.9	Dark Gray
				8	8.18	320	448	13.9	Dark Gray

TABLE 3.3

MONITORING WELL NEST DEVELOPMENT PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Number	*Date Completed*	*Water Level (feet btoc)* [1]	*Total Depth (feet btoc)*	*Volume Removed (liters)*	*pH (standard units)*	*Conductivity (µS/cm)* [2]	*Turbidity (NTU)* [3]	*Temp. (°C)* [4]	*Appearance*
WN - 3C	8/18/00	5.60	26.38	1	8.04	364	>999	15.9	Black and Silty
				2	7.51	403	>999	14.7	Black and Silty
				3	7.68	461	>999	14.4	Black and Silty
				4	7.85	488	>999	14.2	Black and Silty
				5	8.02	504	536	14.1	Dark Gray
				6	8.15	504	378	14.0	Medium Gray
				7	8.24	511	284	13.9	Medium Gray
				8	8.31	519	212	13.8	Medium Gray
WN - 3D	8/18/00	5.60	29.29	1	8.65	665	>999	15.3	Black and Silty
				2	8.70	1007	>999	14.5	Black and Silty
				3	8.73	1074	>999	14.2	Black and Silty
				4	8.73	1078	958	14.1	Dark Gray
				5	8.73	1087	642	14.1	Dark Gray
				6	8.75	1084	417	13.9	Medium Gray
				7	8.75	1089	275	13.9	Medium Gray
				8	8.76	1089	200	13.9	Medium Gray
WN - 3E	8/18/00	5.63	32.20	1	8.67	799	>999	17.2	Black and Silty
				2	8.77	1084	327	15.1	Dark Gray
				3	8.76	1259	111	14.7	Medium Gray
				4	8.75	1274	51.6	14.5	Light Brown
				5	8.75	1268	41.9	14.2	Light Brown
				6	8.74	1225	52.2	14.0	Light Brown
				7	8.74	1335	34.4	14.0	Light Brown
				8	8.74	1348	33	13.9	Light Brown

[1] ft BTOC - feet below top of casing
[2] (µS/cm) - microsiemens per centimeter
[3] (NTU) - neophenolic turbidity units
[4] (°C) - degrees Celsius

TABLE 3.4

MONITORING WELL PURGING PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Number	*Sample Source*	*Sample Date*	*Sample Time*	*Water Level (feet btoc)*[1]	*pH (std. units)*[2]	*Conductivity (ms/cm)*[3]	*Temp. (Celsius)*	*ORP (mv)*[4]	*DO (mg/L)*[5]	*Turbidity (NTU)*[6]	*Appearance*
Pre-Startup Samples E-Unit											
GW-100200-WP-001	WN-3E	10/2/00	11:11	5.52	8.61	18.1	12.47	71	0.19	NA'	Amber tint
GW-100200-WP-002 (Duplicate)					8.61	18.1	12.28	71	0.19	NA	Amber tint
					8.61	18.1	12.17	71	0.19	NA	Amber tint
GW-100200-WP-003	WN-3D	10/2/00	11:55	5.50	8.72	14.51	12.77	91	0.25	NA	Amber tint
					8.70	14.32	12.54	82	0.14	NA	Amber tint
					8.70	14.13	12.44	66	0.10	NA	Amber tint
					8.70	13.92	12.28	51	0.08	NA	Amber tint
					8.69	13.75	12.28	40	0.08	NA	Amber tint
					8.69	13.72	12.24	35	0.07	NA	Amber tint
GW-100200-WP-004	WN-3C	10/2/00	12:16	5.51	8.11	5.49	12.70	67	0.23	NA	Amber Tint
					8.35	5.87	12.69	72	0.14	NA	Amber Tint
					8.36	6.16	12.57	71	0.11	NA	Amber Tint
					8.40	6.35	12.59	70	0.08	NA	Clear
GW-100200-WP-005	WN-3B	10/2/00	12:37	5.51	8.16	2.63	12.87	141	0.45	NA	Amber Tint
					8.17	2.62	12.84	114	0.26	NA	Amber Tint
					8.18	2.61	12.83	112	0.21	NA	Clear
GW-100200-WP-006	WN-3A	10/2/00	12:56	5.53	6.49	1.08	14.28	178	0.25	NA	Clear
					6.48	1.08	14.3	167	0.18	NA	Clear
					6.48	1.08	14.32	166	0.14	NA	Clear
Pre-Startup ER-Unit											
GW-100800-WP-021	WN-1A	10/8/00	9:33	5.30	7.32	1.58	12.69	233	2.25	37.8	Slightly Cloudy
					7.31	1.50	12.71	223	1.61	42.9	Clear
					7.31	1.43	12.75	212	1.23	13.7	Clear
					7.27	1.38	12.73	205	1.0	9.28	Clear
GW-100800-WP-022	WN-1B	10/8/00	10:00	5.31	6.93	2.11	11.52	184	0.63	11.1	Clear
					6.98	2.11	11.52	184	0.56	76.1	Slightly Cloudy
					6.99	2.07	11.51	181	0.52	8.09	Clear
					6.98	2.01	11.47	179	0.49	3.95	Clear

TABLE 3.4

MONITORING WELL PURGING PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Number	*Sample Source*	*Sample Date*	*Sample Time*	*Water Level (feet btoc)* [1]	*pH (std. units)* [2]	*Conductivity (ms/cm)* [3]	*Temp. (Celsius)*	*ORP (mv)* [4]	*DO (mg/L)* [5]	*Turbidity (NTU)* [6]	*Appearance*
Pre-Startup ER-Unit											
GW-100800-WP-023	WN-1C	10/8/00	10:08	5.33	8.39	4.97	11.16	138	0.66	15.6	Amber tint
					8.43	5.04	11.12	143	0.50	7.49	Amber tint
					8.44	5.04	11.10	147	0.44	7.26	Amber tint
					8.45	5.02	11.07	149	0.41	6.12	Amber tint
GW-100800-WP-024	WN-1D	10/8/00	10:39	5.30	8.79	14.43	11.15	168	1.02	12.5	Amber tint
					8.79	14.26	11.08	170	0.64	7.07	Amber tint
					8.78	14.15	11.08	170	0.53	4.39	Amber tint
					8.78	13.99	11.04	170	0.44	3.94	Amber tint
					8.78	13.86	11.02	170	0.38	3.89	Amber tint
GW-100800-WP-025	WN-1E	10/8/00	11:00	5.31	8.78	18.5	11.32	171	0.32	20.7	Amber tint
					8.77	18.5	11.29	166	0.30	9.29	Amber tint
					8.77	18.5	11.08	158	0.28	6.44	Amber tint
GW-100800-WP-026	WN-2A	10/8/00	11:34	5.07	7.19	1.29	12.97	125	0.60	18.8	Clear
GW-100800-WP-027 (Duplicate)					7.01	1.19	12.94	123	0.53	22.3	Clear
					7.00	1.16	12.88	125	0.50	13.5	Clear
					6.99	1.15	12.88	127	0.48	8.79	Clear
GW-100800-WP-028	WN-2B	10/8/00	11:56	5.11	7.16	2.43	11.69	135	0.60	8.79	Clear
					7.20	2.47	11.64	136	0.50	3.35	Clear
					7.20	2.47	11.56	136	0.46	2.75	Clear
GW-100800-WP-029	WN-2C	10/8/00	12:16	5.16	7.79	3.75	11.49	99	0.50	8.78	Clear
					7.86	3.89	11.43	102	0.46	4.47	Clear
					7.96	4.01	11.46	104	0.42	3.19	Clear
					8.00	4.03	11.32	105	0.41	3.24	Clear
GW-100800-WP-030	WN-2D	10/8/00	12:33	5.15	8.83	16.1	11.32	106	0.55	7.69	Amber tint
					8.82	16.0	11.28	112	0.42	9.42	Amber tint
					8.81	15.6	11.25	122	0.36	7.85	Amber tint
					8.80	15.4	11.25	124	0.35	7.47	Amber tint

TABLE 3.4

MONITORING WELL PURGING PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Number	*Sample Source*	*Sample Date*	*Sample Time*	*Water Level (feet btoc)* [1]	*pH (std. units)* [2]	*Conductivity (ms/cm)* [3]	*Temp. (Celsius)*	*ORP (mv)* [4]	*DO (mg/L)* [5]	*Turbidity (NTU)* [6]	*Appearance*
Pre-Startup ER-Unit											
GW-100800-WP-031	WN-2E	10/8/00	12:52	5.31	8.76	18.0	11.43	144	0.46	74.7	Amber tint
					8.76	18.2	11.28	139	0.35	76.2	Amber tint
					8.76	18.3	11.28	135	0.31	43.1	Amber tint
					8.77	18.3	11.22	121	0.28	32.7	Amber tint
One-Week Following Shut Down											
GW-112700-WP-0682	WN-3A	11/27/00	9:02	6.09	7.50	0.884	12.85	73	0.66	1.19	Clear
					7.56	0.884	12.85	55	0.44	0.91	Clear
					7.58	*0.884*	*12.86*	*42*	*0.32*	*0.78*	*Clear*
					7.57	0.884	12.95	24	0.29	0.59	Clear
					7.60	0.884	12.95	20	0.27	0.52	Clear
GW-112700-WP-0683	WN-3B	11/27/00	9:25	6.09	7.74	1.390	12.25	-12	0.33	1.37	Clear
					7.77	1.416	12.22	-22	0.22	0.79	Clear
					7.78	1.425	12.20	-28	0.17	0.36	Clear
					7.78	1.426	12.31	-38	0.15	0.39	Clear
					7.78	1.425	12.22	-52	0.19	0.64	Clear
GW-112700-WP-0684	WN-3C	11/27/00	9:46	6.08	9.60	3.67	11.72	-140	0.19	1.65	Amber tint
					9.58	3.57	11.77	-138	0.12	1.45	Amber tint
					9.58	3.5	11.82	-136	0.11	1.85	Amber tint
					9.55	3.41	11.72	-135	0.08	1.55	Amber tint
					9.58	3.37	11.71	-135	0.09	1.59	Amber tint
					9.57	3.35	11.70	-135	0.08	1.97	Amber tint
GW-112700-WP-0685	WN-3D	11/27/00	10:08	6.09	9.74	14.06	11.34	-127	0.07	1.60	Amber tint
					9.74	13.72	11.32	-127	0.08	1.58	Amber tint
					9.72	13.49	11.36	-130	0.07	1.57	Amber tint
					9.74	13.35	11.41	-132	0.06	2.49	Amber tint
					9.74	13.29	11.46	-135	0.04	1.63	Amber tint
GW-112700-WP-0686	WN-3E	11/27/00	10:26	6.09	9.59	21.2	11.48	-150	0.11	1.63	Amber tint
GW-112700-WP-0687 (Duplicate)					9.59	21.1	11.52	-156	0.07	2.12	Amber tint
					9.60	21.0	11.52	-165	0.07	2.16	Amber tint
					9.60	20.9	*11.57*	*-175*	*0.06*	*2.16*	*Amber tint*

TABLE 3.4

MONITORING WELL PURGING PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Number	*Sample Source*	*Sample Date*	*Sample Time*	*Water Level (feet btoc)*[1]	*pH (std. units)*[2]	*Conductivity (ms/cm)*[3]	*Temp. (Celsius)*	*ORP (mv)*[4]	*DO (mg/L)*[5]	*Turbidity (NTU)*[6]	*Appearance*
One-Week Following Shut Down											
GW-112700-WP-0688	WN-2A	11/27/00	11:06	5.64	7.89	0.849	12.69	-155	0.20	1.28	Clear
(MS/MSD)°					7.82	0.812	12.73	-152	0.16	0.64	Clear
					7.81	0.806	12.78	-150	0.11	0.65	Clear
					7.84	0.805	12.71	-149	0.10	0.58	Clear
GW-112700-WP-0689	WN-2B	11/27/00	11:38	5.68	7.47	1.263	12.07	-129	0.15	1.54	Clear
					7.43	1.228	12.13	-126	0.11	1.24	Clear
					7.44	1.214	12.14	-125	0.10	1.01	Clear
					7.45	1.203	12.15	-124	0.11	1.01	Clear
GW-112700-WP-0690	WN-2C	11/27/00	11:58	5.74	7.49	1.259	11.63	-126	0.13	1.33	Clear
					7.53	1.275	11.65	-127	0.13	1.57	Clear
					7.60	1.269	11.61	-132	0.12	1.36	Clear
					7.65	1.253	11.59	-133	0.11	1.30	Clear
GW-112700-WP-0691	WN-2D	11/27/00	12:20	5.72	8.14	1.385	11.17	-161	0.13	2.32	Amber tint
					8.38	1.357	11.18	-171	0.10	4.68	Amber tint
					8.53	1.339	11.21	-182	0.09	4.98	Amber tint
					8.66	1.305	11.15	-188	0.06	5.07	Amber tint
					8.66	1.281	11.16	-193	0.07	4.62	Amber tint
GW-112700-WP-0692	WN-2E	11/27/00	12:44	5.90	9.62	14.80	11.19	-240	0.08	6.04	Amber tint
GW-112700-WP-0693 (Duplicate)					9.61	13.40	11.18	-239	0.05	5.29	Amber tint
					9.60	12.01	11.19	-239	0.05	4.33	Amber tint
					9.59	10.49	11.21	-239	0.03	4.26	Amber tint
					9.60	9.75	11.11	-239	0.06	4.73	Amber tint
					9.58	9.40	11.05	-239	0.05	4.67	Amber tint
GW-112700-WP-0694	WN-1A	11/27/00	13:21	6.87	8.08	1.040	12.22	-184	0.63	1.45	Clear
					7.82	0.957	12.29	-158	0.32	1.32	Clear
					7.83	0.927	12.31	-156	0.16	1.73	Clear
					7.83	0.919	12.31	-155	0.15	1.61	Clear

TABLE 3.4

MONITORING WELL PURGING PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Number	*Sample Source*	*Sample Date*	*Sample Time*	*Water Level (feet btoc)*[1]	*pH (std. units)*[2]	*Conductivity (ms/cm)*[3]	*Temp. (Celsius)*	*ORP (mv)*[4]	*DO (mg/L)*[5]	*Turbidity (NTU)*[6]	*Appearance*
One-Week Following Shut Down											
GW-112700-WP-0695	WN-1B	11/27/00	13:36	6.88	7.60	1.417	11.80	-140	0.24	1.71	Clear
					7.54	1.333	11.87	-138	0.16	1.88	Clear
					7.54	1.301	11.87	-137	0.15	1.41	Clear
					7.54	1.298	11.90	-136	0.13	1.33	Clear
GW-112700-WP-0696	WN-1C	11/27/00	13:54	6.90	9.37	1.094	11.35	-223	0.17	7.34	Amber tint
					9.34	1.052	11.35	-224	0.13	6.00	Amber tint
					9.32	1.05	11.38	-223	0.13	5.41	Amber tint
					9.34	1.046	11.40	-223	0.10	4.87	Amber tint
GW-112700-WP-0697	WN-1D	11/27/00	14:13	6.87	9.65	0.553	11.25	-235	0.13	18.2	Clear
					9.70	0.534	11.30	-234	0.12	18.5	Clear
					9.69	0.525	11.30	-233	0.16	18.4	Clear
					9.70	0.523	11.33	-233	0.13	18.3	Clear
GW-112700-WP-0698	WN-1E	11/27/00	14:29	6.86	9.20	0.876	11.17	-203	0.14	1.06	Clear
					9.21	0.794	11.15	-202	0.11	1.06	Clear
					9.24	0.800	11.1	-202	0.09	1.04	Clear
					9.26	0.806	11.16	-202	0.07	1.02	Clear
Four-Weeks Following Shut Down											
GW-121800-WP-0699	WN-1A	12/18/00	11:00	6.20	6.88	0.823	11.56	-169	0.55	1.72	Clear
					6.92	0.799	11.53	-165	0.45	1.48	Clear
					6.92	0.787	11.55	-161	0.43	1.26	Clear
					6.88	0.784	11.51	-159	0.34	1.06	Clear
GW-121800-WP-0700	WN-1B	12/18/00	11:28	6.19	6.57	1.281	10.67	-136	0.54	2.31	Clear
					6.54	1.241	10.99	-132	0.43	1.73	Clear
					6.54	1.236	10.87	-130	0.34	1.32	Clear
GW-121800-WP-0701	WN-1C	12/18/00	11:50	6.20	8.64	0.848	10.81	-221	0.30	19.5	Amber tint
					8.60	0.869	10.97	-219	0.23	19.1	Amber tint
					8.60	0.858	10.98	-217	0.20	17.9	Amber tint
					8.59	0.834	10.97	-214	0.19	15.6	Amber tint

TABLE 3.4

MONITORING WELL PURGING PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Number	*Sample Source*	*Sample Date*	*Sample Time*	*Water Level (feet btoc)* [1]	*pH (std. units)* [2]	*Conductivity (ms/cm)* [3]	*Temp. (Celsius)*	*ORP (mv)* [4]	*DO (mg/L)* [5]	*Turbidity (NTU)* [6]	*Appearance*
Four-Weeks Following Shut Down											
GW-121800-WP-0702	WN-1D	12/18/00	12.15	6.19	8.78	0.583	10.67	-218	0.25	52.7	Amber tint
					8.82	0.558	10.77	-217	0.22	28.2	Amber tint
					8.83	0.548	10.65	-216	0.21	16.4	Amber tint
GW-121800-WP-0703	WN-1E	12/18/00	12:36	6.18	8.27	1.540	10.15	-185	0.28	1.59	Clear
					8.33	1.498	10.29	-189	0.25	1.37	Clear
					8.36	1.462	10.31	-191	0.24	1.19	Clear
GW-121800-WP-0704	WN-2A	12/18/00	10:34	5.95	7.14	0.878	9.43	189	1.26	1.36	Clear
					7.18	0.860	10.10	173	0.81	0.98	Clear
					6.95	0.855	10.55	166	0.57	0.94	Clear
					7.02	0.845	10.84	146	0.36	0.94	Clear
GW-121800-WP-0705	WN-2B	12/18/00	10:53	5.99	6.57	1.200	10.86	145	0.84	1.7	Clear
					6.54	1.185	11.03	142	0.24	1.61	Clear
					6.52	1.180	11.06	139	0.22	1.49	Clear
GW-121800-WP-0706	WN-2C	12/18/00	11:10	6.06	6.66	1.206	10.43	145	0.24	1.44	Clear
					6.66	1.222	10.41	141	0.21	1.57	Clear
					6.73	1.228	10.42	134	0.19	1.8	Clear
GW-121800-WP-0707	WN-2D	12/18/00	11:28	6.03	7.69	1.275	10.12	98	0.22	4.09	Amber tint
					8.07	1.24	10.27	101	0.16	5.68	Amber tint
					8.06	1.227	10.36	93	0.13	5.53	Amber tint
GW-121800-WP-0708	WN-2E	12/18/00	11:48	6.19	8.97	18.1	10.19	7	0.10	5.53	Amber tint
GW-121800-WP-0714 (Duplicate)			11:55		8.95	17.5	10.20	-2	0.10	4.43	Amber tint
					8.90	16.7	10.24	-14	0.10	3.42	Amber tint
					9.01	15.6	10.33	-20	0.10	3.12	Amber tint
GW-121800-WP-0709 (MS/MSD)	WN-3C	12/18/00	12:35	6.39	9.03	4.22	11.17	114	1.17	2.11	Amber tint
					9.03	4.15	10.94	112	0.34	1.77	Amber tint
					9.07	4.06	10.85	105	0.25	2.17	Amber tint
					9.06	4.01	11.03	98	0.19	2.05	Amber tint

TABLE 3.4

MONITORING WELL PURGING PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Number	*Sample Source*	*Sample Date*	*Sample Time*	*Water Level (feet btoc)* [1]	*pH (std. units)* [2]	*Conductivity (ms/cm)* [3]	*Temp. (Celsius)*	*ORP (mv)* [4]	*DO (mg/L)* [5]	*Turbidity (NTU)* [6]	*Appearance*
Four-Weeks Following Shut Down											
GW-121800-WP-0710	WN-3A	12/18/00	13:10	6.41	6.77	0.878	11.57	120	0.17	0.68	Clear
					6.83	0.875	11.58	122	0.16	0.99	Clear
					6.85	0.874	11.56	119	0.14	0.46	Clear
GW-121800-WP-0711	WN-3B	12/18/00	13:25	6.39	6.95	1.359	11.46	121	0.18	1.76	Clear
					7.04	1.365	11.61	94	0.16	0.95	Clear
					7.01	1.367	11.58	76	0.14	0.58	Clear
GW-121800-WP-0712	WN-3D	12/18/00	13:34	6.40	9.19	13.86	10.77	56	0.18	2.17	Amber tint
					9.19	13.54	10.84	45	0.07	2.24	Amber tint
					9.19	13.29	10.87	35	0.07	2.09	Amber tint
GW-121800-WP-0713	WN-3E	12/18/00	13:44	6.40	9.04	20.8	10.63	-34	0.09	2.79	Amber tint
					9.05	20.7	10.65	-47	0.07	3.03	Amber tint
					9.05	20.6	10.58	-61	0.07	2.42	Amber tint

[1] btoc - below top of casing
[2] std. Units - standard units
[3] ms/cm - millisiemens per centimeter
[4] mv - millivolts
[5] mg/L - milligrams per liter
[6] NTU - nephelometric turbidity units
[7] NA -- not available
[8] MS/MSD - matrix spike/matrix spike duplicate

Note:
Monitoring well samples analyzed for volatile organic compounds, semivolatile organic compounds, phenolics, ammonia, arsenic, cyanide and thiocyanate.

TABLE 3.5

SUMMARY OF ANALYTICAL METHODS
WCP SITE PILOT PROJECT
WAUKEGAN, ILLINOIS

Parameter[1]	*Preparation Method Reference*[2]	*Analysis Method Reference*
Groundwater/Process Water		
VOCs	SW-846 5030B	SW-846 8260B
SVOCs	SW-846 3510C	SW-846 8270C
Arsenic	SW-846 3010A	SW-846 6010B
Alkalinity	SM 2320B	EPA 310.1
Ammonia	EPA 350.1	EPA 350.1
Bromide	EPA 300.0	EPA 300.0
Chemical Oxygen Demand	EPA 410.4	EPA 410.4
Chloride	EPA 300.0	EPA 300.0
Cyanide	EPA 335.4	EPA 335.4
Nitrate	EPA 300.0	EPA 300.0
Thiocyanate	SM 4500-CN-M	SM 4500-CN-M
Total Phenolics	EPA 420.2	EPA 420.2
Total Suspended Solids	EPA 160.2	EPA 160.2
Field Measurements - Groundwater Monitoring		
pH	NA[3]	EPA 150.1
Temperature	NA	EPA 170.1
Conductivity	NA	EPA 120.1
Dissolved Oxygen	NA	EPA 360.1
Oxidation-Reduction Potential	NA	SM 2580 B
Turbidity	NA	EPA 180.1

[1] VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
SOP - Standard Operating Procedure

[2] SW-846 - "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", EPA SW-846, 3rd Edition with promulgated updates, November 1986.
EPA - "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, revised March 1
SM - "Standard Methods for the Examination of Water and Wastewater", APHA, 18th Edition, 199

[3] NA - Not Applicable

TABLE 3.6

PILOT STUDY SAMPLING SUMMARY
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Pilot Cell	Purpose	Week Number	Sampling Frequency	Locations Sampled	Number of Events	Number of Locations Sampled	Sample Points/ Location	Samples Per Event	Total Samples	Analyses: Total Phenolics	As[1]	Ammonia	Bromide	TCL VOCs[2]	TCL SVOCs[3]	Nitrate	COD[4]	Cyanide	Thiocyanate	Alkalinity	TSS[5]
Extraction/Reinjection Unit	PHASE 1 Contaminant Mass Removal Determination (Two Week Duration)	Week 1	Once (Prior to Startup)	WN-1, WN-2	1	2	5	10	10	10	10	10	--	10	10	--	--	10	10	--	--
		Week 1	2/Day	WN-1	14	1	5	5	70	70	70	70	--	--	--	--	--	--	--	--	--
		Week 2	1/Day	WN-1	7	1	5	5	35	35	35	35	--	--	--	--	--	--	--	--	--
		Week 1 and 2	3/Week	WN-2	6	1	5	5	35	35	35	35	--	--	--	--	--	--	--	--	--
		Week 1 and 2	3/Week	WN-1, WN-2	6	2	5	10	60	--	--	--	--	60	60	--	--	60	60	--	--
		Week 1 and 2	3/Week	EW-1, EW-2, EW-3	6	3	1	3	18	18	18	18	--	18	18	18	18	18	18	18	18
				Subtotal - Contaminant Mass Removal Determination E/R Unit					**228**	**168**	**168**	**168**	**--**	**88**	**88**	**18**	**18**	**88**	**88**	**18**	**18**
	PHASE 2 Tracer Test (Four Week Duration)	Week 3	Once (Prior to Startup)	WN-1, WN-2, EW-1, EW-2 EW-3, RW-1, RW-2, RW-3	1	8	--	16	16	--	--	--	16	--	--	--	--	--	--	--	--
		Week 3	Once (30 minutes following tracer injection)	RW-2	1	1	1	1	1	--	--	--	1	--	--	--	--	--	--	--	--
		Week 3	2/Day	WN-1, WN-2	7	2	5	10	70	--	--	--	70	--	--	--	--	--	--	--	--
		Weeks 4 through 6	1/Day	WN-1, WN-2	21	2	5	10	210	--	--	--	210	--	--	--	--	--	--	--	--
		Weeks 4 through 6	1/Week	WN-1, WN-2	3	2	5	10	30	--	--	--	--	30	30	--	--	30	30	--	--
		Weeks 4 through 6	3/Week	WN-1, WN-2	9	2	5	10	90	90	90	90	--	--	--	--	--	--	--	--	--
		Week 3	1/Day	RW-2	7	1	1	1	7	--	--	--	7	--	--	--	--	--	--	--	--
		Weeks 4 through 6	3/Week	RW-2	9	1	1	1	9	--	--	--	9	--	--	--	--	--	--	--	--
		Weeks 3 through 6	1/Day	EW-1, EW-2, EW-3	28	3	1	3	84	--	--	--	84	--	--	--	--	--	--	--	--
		Weeks 3 through 6	1/Week	EW-1, EW-2, EW-3	4	3	1	3	12	12	12	12	--	12	12	12	12	12	12	12	12
		One Week and Four Weeks Following Shutdown	Twice	WN-1, WN-2	2	2	5	10	20	20	20	20	--	20	20	--	--	20	20	--	--
				Subtotal - Tracer Test E/R Unit					**533**	**122**	**122**	**122**	**397**	**62**	**62**	**12**	**12**	**62**	**62**	**12**	**12**
Extraction Unit	Contaminant Mass Removal Determination	Week No. 1	Once (Prior to Startup)	WN-3	1	1	5	5	5	5	5	5	--	5	5	--	--	5	5	--	--
		Weeks 1, 3, 5, 7[6]	3 Events/ Week	WN-3	12	1	5	5	60	60	60	60	--	--	--	--	--	--	--	--	--
		Weeks 1, 3, 5, 7	Once/Week	WN-3	4	1	5	5	20	--	--	--	--	20	20	--	--	20	20	--	--
		Weeks 1, 3, 5, 7	3 Events/ Week	EW-4	12	1	1	1	12	12	12	12	--	12	12	12	12	12	12	12	12
		One Week and Four Weeks Following Unit Shutdown	Twice	WN-3	2	1	5	5	10	10	10	10	--	10	10	--	--	10	10	--	--
				Subtotal - Contaminant Mass Removal Determination E Unit					**107**	**87**	**87**	**87**	**--**	**42**	**42**	**12**	**12**	**42**	**42**	**12**	**12**
				TOTAL SAMPLES					**868**	**377**	**377**	**377**	**397**	**192**	**192**	**42**	**42**	**192**	**192**	**42**	**42**

[1] As - Arsenic
[2] TCL VOCs - Target Compound List Volatile Organic Compounds
[3] TCL SVOCs -Target Compound List Semivolatile Organic Compounds
[4] COD - Chemical Oxygen Demand
[5] TSS - Total Suspended Solids
[6] Denotes weeks when E Unit is in operational mode (odd weeks) rather than shutdown mode (even weeks). No samples will be collected between Week 1 and Week 7 when the E Unit is in shutdown mode.
WN = well nest
EW = extraction well
RW = reinjection well

TABLE 4.1

GROUNDWATER ELEVATIONS AND MONITORING WELL/
PIEZOMETER TOTAL DEPTHS
JULY 11, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Identification	*Top of Casing Elevation (ft AMSL)* [1]	*Depth to Water (ft BTOC)* [2]	*Groundwater Elevation (ft AMSL)*	*Well Stickup (feet)*	*Measured Total Depth (ft BTOC)*	*Estimated Total Depth (ft BGS)* [3]	*Published Total Depth (ft BGS)*
Shallow Monitoring Wells & Piezometers							
MW-1S	587.76	4.55	583.21	1.45	19.50	18.05	17.5
MW-3S	588.24	4.77	583.47	2.55	14.85	12.30	12.0
MW-4S	586.16	2.75	583.41	-0.25	12.08	12.33	12.0
MW-5S	587.89	6.92	580.97	1.95	16.10	14.15	13.2
MW-6S	588.45	6.64	581.81	2.45	16.60	14.15	13.5
MW-7S	587.78	4.08	583.70	2.20	5.60	3.40	11.6
MW-8S	586.43	3.83	582.60	-0.02	12.30	12.32	12.6
MW-9S	588.49	4.99	583.50	2.65	14.95	12.30	12.4
MW-10S	588.58	6.58	582.00	2.60	16.11	13.51	13.4
MW-11S	587.83	5.55	582.28	2.60	14.10	11.50	11.4
MW-12S	586.03	2.81	583.22	-0.25	4.11	4.36	12.4
MW-13S	586.95	3.68	583.27	-0.04	4.78	4.82	13.2
MW-14S	583.92	1.33	582.59	-0.45	11.35	11.80	11.7
MW-15S	585.33	1.99	583.34	-0.20	11.65	11.85	11.8
P-102	588.52	5.32	583.20	2.75	14.90	12.15	12.2
P-103	589.44	6.43	583.01	2.60	15.23	12.63	12.5
P-104	589.07	5.53	583.54	2.85	14.85	12.00	12.0
P-105	583.96	2.12	581.84 [4]	-0.45	7.76	8.21	11.7
P-107	584.41	1.52	582.89	-0.95	11.20	12.15	12.5
Deep Monitoring Wells & Piezometers							
MW-1D	587.62	4.43	583.19	1.45	29.54	28.09	27.7
MW-3D	588.23	4.72	583.51	2.40	30.62	28.22	27.8
MW-4D	585.93	2.62	583.31	0.60	31.96	31.36	32.0
MW-5D	588.47	7.52	580.95	2.60	28.39	25.79	26.0
MW-6D	588.51	6.88	581.63	2.60	29.30	26.70	26.5
MW-7D	588.14	4.48	583.66	2.90	34.28	31.38	31.1
MW-8D	586.09	3.44	582.65	0.40	29.82	29.42	30.8
MW-9D	588.65	5.10	583.55	2.50	34.10	31.60	31.5
MW-10D	588.60	6.67	581.93	2.70	32.54	29.84	29.8
MW-11D	587.98	5.48	582.50	2.60	30.58	27.98	27.7
MW-12D	586.01	2.79	583.22	-0.35	33.28	33.63	33.7
MW-13D	586.90	3.78	583.12	-0.35	33.02	33.37	33.5
MW-14D	584.05	1.50	582.55	-0.30	30.45	30.75	31.1
MW-15D	585.39	2.12	583.27	0.25	28.90	28.65	29.2
P-106	589.60	6.63	582.97	2.65	31.82	29.17	28.9
P-108	589.52	6.54	582.98	2.60	32.22	29.62	29.0
PW-1	589.00	6.08	582.92	2.45	35.88	33.43	33.4

[1] ft AMSL - feet above mean sea level

[2] ft BTOC - feet below top of casing

ft BGS - feet below ground surface

[4] Elevation not used to construct groundwater contour maps illustrated on Figures 4.2 and 4.3.

TABLE 4.2

SUMMARY OF CALCULATED HYDRAULIC CONDUCTIVITY VALUES
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Monitoring Well Number	*Calculated Hydraulic Conductivity cm/sec*	
	Test Number One	*Test Number Two*
MW-4D	7.9×10^{-4}	9.5×10^{-4}
MW-7D	2.9×10^{-3}	2.3×10^{-3}
MW-8D	2.6×10^{-3}	3.0×10^{-3}
MW-9D	2.2×10^{-3}	2.2×10^{-3}
	Geometric Mean	**1.9×10^{-3} cm/sec** **5.4 feet/day**

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Monitoring Location	Reference Elevation (feet AMSL)[1]	10/2/00 Depth to Water (feet btoc)[2]	10/2/00 Groundwater Elevation (feet AMSL)	10/3/00 Depth to Water (feet btoc)	10/3/00 Groundwater Elevation (feet AMSL)	10/4/00 Depth to Water (feet btoc)	10/4/00 Groundwater Elevation (feet AMSL)	10/5/00 Depth to Water (feet btoc)	10/5/00 Groundwater Elevation (feet AMSL)
E-Unit									
EW-4	587.09	5.40	581.69	6.56	580.53	6.80	580.29	5.56	581.53
WN-3A	587.24	5.53	581.71	5.66	581.58	5.61	581.63	5.54	581.70
WN-3B	587.22	5.51	581.71	5.69	581.53	5.65	581.57	5.59	581.63
WN-3C	587.22	5.51	581.71	5.76	581.46	5.73	581.49	5.69	581.53
WN-3D	587.21	5.50	581.71	5.83	581.38	5.81	581.40	5.76	581.45
WN-3E	587.23	5.52	581.71	5.81	581.42	5.78	581.45	5.71	581.52
ER-Unit									
EW-1	587.08	N/A[3]		N/A		N/A		N/A	
EW-2	587.40	N/A		N/A		N/A		N/A	
EW-3	587.26	N/A		N/A		N/A		N/A	
RW-1	587.28	N/A		N/A		N/A		N/A	
RW-2	587.28	N/A		N/A		N/A		N/A	
RW-3	587.33	N/A		N/A		N/A		N/A	
RW-4	587.19	N/A		N/A		N/A		N/A	
RW-5	587.38	N/A		N/A		N/A		N/A	
RW-6	587.36	N/A		N/A		N/A		N/A	
WN-1A	587.01	N/A		N/A		N/A		N/A	
WN-1B	587.02	N/A		N/A		N/A		N/A	
WN-1C	587.04	N/A		N/A		N/A		N/A	
WN-1D	587.01	N/A		N/A		N/A		N/A	
WN-1E	587.01	N/A		N/A		N/A		N/A	
WN-2A	586.78	N/A		N/A		N/A		N/A	
WN-2B	586.82	N/A		N/A		N/A		N/A	
WN-2C	586.87	N/A		N/A		N/A		N/A	
WN-2D	586.86	N/A		N/A		N/A		N/A	
WN-2E	587.03	N/A		N/A		N/A		N/A	

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	10/6/00		*10/7/00*		*10/8/00*		*10/9/00*	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	7.15	579.94	6.98	580.11	7.14	579.95	N/A	
WN-3A	5.52	581.72	5.51	581.73	5.57	581.67	N/A	
WN-3B	5.58	581.64	5.57	581.65	5.61	581.61	N/A	
WN-3C	5.67	581.55	5.65	581.57	5.72	581.50	N/A	
WN-3D	5.76	581.45	5.72	581.49	5.79	581.42	N/A	
WN-3E	5.75	581.48	5.72	581.51	5.78	581.45	N/A	
ER-Unit								
EW-1	N/A		N/A		5.37	581.71	5.43	581.65
EW-2	N/A		N/A		5.70	581.70	5.75	581.65
EW-3	N/A		N/A		5.54	581.72	5.60	581.66
RW-1	N/A		N/A		5.59	581.69	5.66	581.62
RW-2	N/A		N/A		5.57	581.71	5.62	581.66
RW-3	N/A		N/A		5.63	581.70	5.68	581.65
RW-4	N/A		N/A		5.47	581.72	5.53	581.66
RW-5	N/A		N/A		5.68	581.70	5.72	581.66
RW-6	N/A		N/A		5.65	581.71	5.70	581.66
WN-1A	N/A		N/A		5.30	581.71	5.33	581.68
WN-1B	N/A		N/A		5.31	581.71	5.34	581.68
WN-1C	N/A		N/A		5.33	581.71	5.38	581.66
WN-1D	N/A		N/A		5.30	581.71	5.33	581.68
WN-1E	N/A		N/A		5.31	581.70	5.33	581.68
WN-2A	N/A		N/A		5.07	581.71	5.09	581.69
WN-2B	N/A		N/A		5.11	581.71	5.13	581.69
WN-2C	N/A		N/A		5.16	581.71	5.18	581.69
WN-2D	N/A		N/A		5.15	581.71	5.18	581.68
WN-2E	N/A		N/A		5.31	581.72	5.35	581.68

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	10/10/00		*10/11/00*		*10/12/00*		*10/13/00*	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	N/A		N/A		N/A		N/A	
WN-3A	N/A		N/A		N/A		N/A	
WN-3B	N/A		N/A		N/A		N/A	
WN-3C	N/A		N/A		N/A		N/A	
WN-3D	N/A		N/A		N/A		N/A	
WN-3E	N/A		N/A		N/A		N/A	
ER-Unit								
EW-1	6.33	580.75	6.45	580.63	6.49	580.59	6.33	580.75
EW-2	6.33	581.07	6.42	580.98	6.49	580.91	6.50	580.90
EW-3	6.59	580.67	6.90	580.36	6.62	580.64	6.83	580.43
RW-1	5.27	582.01	5.37	581.91	5.38	581.90	5.35	581.93
RW-2	5.28	582.00	5.38	581.90	5.39	581.89	5.39	581.89
RW-3	5.30	582.03	5.29	582.04	5.32	582.01	5.40	581.93
RW-4	5.08	582.11	5.12	582.07	5.12	582.07	5.17	582.02
RW-5	5.21	582.17	5.12	582.26	5.14	582.24	5.29	582.09
RW-6	5.42	581.94	5.44	581.92	5.45	581.91	5.49	581.87
WN-1A	5.36	581.65	5.40	581.61	5.43	581.58	5.47	581.54
WN-1B	5.39	581.63	5.42	581.60	5.46	581.56	5.48	581.54
WN-1C	5.48	581.56	5.51	581.53	5.55	581.49	5.57	581.47
WN-1D	5.50	581.51	5.53	581.48	5.55	581.46	5.57	581.44
WN-1E	5.53	581.48	5.57	581.44	5.61	581.40	5.61	581.40
WN-2A	5.05	581.73	5.17	581.61	5.22	581.56	5.24	581.54
WN-2B	5.21	581.61	5.26	581.56	5.31	581.51	5.30	581.52
WN-2C	5.42	581.45	5.47	581.40	5.46	581.41	5.49	581.38
WN-2D	5.64	581.22	5.68	581.18	5.67	581.19	5.72	581.14
WN-2E	5.86	581.17	5.91	581.12	5.89	581.14	5.93	581.10

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	10/14/00		*10/15/00*		*10/16/00*		*10/17/00*	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	N/A		N/A		5.63	581.46	6.87	580.22
WN-3A	N/A		N/A		5.78	581.46	5.86	581.38
WN-3B	N/A		N/A		5.76	581.46	5.88	581.34
WN-3C	N/A		N/A		5.75	581.47	5.94	581.28
WN-3D	N/A		N/A		5.77	581.44	6.02	581.19
WN-3E	N/A		N/A		5.75	581.48	6.00	581.23
ER-Unit								
EW-1	6.58	580.50	6.57	580.51	6.76	580.32	6.77	580.31
EW-2	6.57	580.83	6.59	580.81	6.71	580.69	6.79	580.61
EW-3	6.85	580.41	6.80	580.46	7.06	580.20	7.29	579.97
RW-1	5.45	581.83	5.44	581.84	5.50	581.78	5.55	581.73
RW-2	5.48	581.80	5.46	581.82	5.53	581.75	5.55	581.73
RW-3	5.46	581.87	5.49	581.84	5.56	581.77	5.55	581.78
RW-4	5.21	581.98	5.26	581.93	5.29	581.90	5.30	581.89
RW-5	5.37	582.01	5.40	581.98	5.41	581.97	5.30	582.08
RW-6	5.52	581.84	5.57	581.79	5.61	581.75	5.63	581.73
WN-1A	5.48	581.53	5.56	581.45	5.56	581.45	5.60	581.41
WN-1B	5.51	581.51	5.54	581.48	5.59	581.43	5.64	581.38
WN-1C	5.59	581.45	5.62	581.42	5.68	581.36	5.72	581.32
WN-1D	5.60	581.41	5.63	581.38	5.70	581.31	5.73	581.28
WN-1E	5.62	581.39	5.65	581.36	5.72	581.29	5.76	581.25
WN-2A	5.29	581.49	5.36	581.42	5.35	581.43	5.38	581.40
WN-2B	5.34	581.48	5.39	581.43	5.43	581.39	5.45	581.37
WN-2C	5.50	581.37	5.54	581.33	5.60	581.27	5.64	581.23
WN-2D	5.71	581.15	5.72	581.14	5.82	581.04	5.87	580.99
WN-2E	5.92	581.11	5.96	581.07	6.05	580.98	6.10	580.93

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	10/18/00		10/19/00		10/20/00		10/21/00	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	6.90	580.19	6.95	580.14	7.03	580.06	7.16	579.93
WN-3A	5.90	581.34	5.93	581.31	5.95	581.29	6.00	581.24
WN-3B	5.91	581.31	5.97	581.25	5.97	581.25	6.02	581.20
WN-3C	5.97	581.25	6.00	581.22	6.03	581.19	6.08	581.14
WN-3D	6.03	581.18	6.06	581.15	6.09	581.12	6.13	581.08
WN-3E	6.01	581.22	6.05	581.18	6.10	581.13	6.14	581.09
ER-Unit								
EW-1	6.79	580.29	6.75	580.33	6.86	580.22	6.82	580.26
EW-2	6.84	580.56	6.83	580.57	6.85	580.55	6.91	580.49
EW-3	7.39	579.87	7.56	579.70	7.39	579.87	7.82	579.44
RW-1	5.60	581.68	5.60	581.68	5.58	581.70	5.64	581.64
RW-2	5.59	581.69	5.60	581.68	5.60	581.68	5.66	581.62
RW-3	5.60	581.73	5.62	581.71	5.65	581.68	5.71	581.62
RW-4	5.36	581.83	5.39	581.80	5.44	581.75	5.48	581.71
RW-5	5.42	581.96	5.43	581.95	5.49	581.89	5.55	581.83
RW-6	5.70	581.66	5.72	581.64	5.75	581.61	5.80	581.56
WN-1A	5.67	581.34	5.67	581.34	5.70	581.31	5.75	581.26
WN-1B	5.68	581.34	5.69	581.33	5.72	581.30	5.76	581.26
WN-1C	5.76	581.28	5.76	581.28	5.80	581.24	5.83	581.21
WN-1D	5.78	581.23	5.77	581.24	5.80	581.21	5.85	581.16
WN-1E	5.79	581.22	5.80	581.21	5.83	581.18	5.88	581.13
WN-2A	5.41	581.37	5.43	581.35	5.47	581.31	5.51	581.27
WN-2B	5.49	581.33	5.50	581.32	5.52	581.30	5.57	581.25
WN-2C	5.67	581.20	5.68	581.19	5.69	581.18	5.74	581.13
WN-2D	5.90	580.96	5.88	580.98	5.90	580.96	5.95	580.91
WN-2E	6.12	580.91	6.11	580.92	6.13	580.90	6.17	580.86

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	10/22/00		10/23/00		10/24/00		10/25/00	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	7.19	579.90	7.26	579.83	5.88	581.21	5.90	581.19
WN-3A	6.01	581.23	6.05	581.19	6.02	581.22	6.04	581.20
WN-3B	6.05	581.17	6.07	581.15	6.00	581.22	6.02	581.20
WN-3C	6.12	581.10	6.14	581.08	5.99	581.23	6.01	581.21
WN-3D	6.17	581.04	6.20	581.01	5.99	581.22	6.02	581.19
WN-3E	6.17	581.06	6.20	581.03	5.99	581.24	6.01	581.22
ER-Unit								
EW-1	6.89	580.19	6.95	580.13	5.85	581.23	6.87	580.21
EW-2	7.02	580.38	7.06	580.34	6.18	581.22	6.92	580.48
EW-3	7.80	579.46	7.91	579.35	6.02	581.24	7.76	579.50
RW-1	5.68	581.60	5.73	581.55	6.07	581.21	5.99	581.29
RW-2	5.70	581.58	5.74	581.54	6.05	581.23	6.01	581.27
RW-3	5.72	581.61	5.77	581.56	6.10	581.23	6.03	581.30
RW-4	5.48	581.71	5.53	581.66	5.96	581.23	5.22	581.97
RW-5	5.52	581.86	5.57	581.81	6.16	581.22	5.15	582.23
RW-6	5.82	581.54	5.87	581.49	6.13	581.23	5.64	581.72
WN-1A	5.77	581.24	5.79	581.22	5.79	581.22	5.81	581.20
WN-1B	5.78	581.24	5.82	581.20	5.79	581.23	5.85	581.17
WN-1C	5.86	581.18	5.90	581.14	5.81	581.23	5.93	581.11
WN-1D	5.87	581.14	5.91	581.10	5.77	581.24	5.98	581.03
WN-1E	5.91	581.10	5.95	581.06	5.79	581.22	6.01	581.00
WN-2A	5.53	581.25	5.55	581.23	5.55	581.23	5.57	581.21
WN-2B	5.60	581.22	5.63	581.19	5.58	581.24	5.63	581.19
WN-2C	5.77	581.10	5.82	581.05	5.64	581.23	5.81	581.06
WN-2D	5.98	580.88	6.04	580.82	5.63	581.23	6.02	580.84
WN-2E	6.21	580.82	6.27	580.76	5.79	581.24	6.25	580.78

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Monitoring Location	10/26/00 Depth to Water (feet btoc)	10/26/00 Groundwater Elevation (feet AMSL)	10/27/00 Depth to Water (feet btoc)	10/27/00 Groundwater Elevation (feet AMSL)	10/28/00 Depth to Water (feet btoc)	10/28/00 Groundwater Elevation (feet AMSL)	10/29/00 Depth to Water (feet btoc)	10/29/00 Groundwater Elevation (feet AMSL)
E-Unit								
EW-4	5.89	581.20	N/A[1]		N/A		N/A	
WN-3A	6.03	581.21	N/A		N/A		N/A	
WN-3B	6.02	581.20	N/A		N/A		N/A	
WN-3C	6.01	581.21	N/A		N/A		N/A	
WN-3D	6.01	581.20	N/A		N/A		N/A	
WN-3E	6.02	581.21	N/A		N/A		N/A	
ER-Unit								
EW-1	6.87	580.21	6.88	580.20	6.85	580.23	6.93	580.15
EW-2	6.96	580.44	6.97	580.43	6.92	580.48	7.04	580.36
EW-3	7.83	579.43	7.85	579.41	7.85	579.41	7.92	579.34
RW-1	6.00	581.28	6.05	581.23	6.05	581.23	6.04	581.24
RW-2	6.01	581.27	6.04	581.24	6.09	581.19	6.06	581.22
RW-3	6.04	581.29	6.08	581.25	6.10	581.23	6.10	581.23
RW-4	5.22	581.97	5.23	581.96	5.21	581.98	5.14	582.05
RW-5	5.12	582.26	5.21	582.17	5.23	582.15	5.05	582.33
RW-6	5.65	581.71	5.68	581.68	5.67	581.69	5.61	581.75
WN-1A	5.83	581.18	5.84	581.17	5.85	581.16	5.87	581.14
WN-1B	5.86	581.16	5.89	581.13	5.88	581.14	5.92	581.10
WN-1C	5.95	581.09	5.91	581.13	5.99	581.05	5.99	581.05
WN-1D	5.98	581.03	5.99	581.02	6.01	581.00	6.02	580.99
WN-1E	6.01	581.00	6.02	580.99	6.03	580.98	6.06	580.95
WN-2A	5.60	581.18	5.63	581.15	5.62	581.16	5.64	581.14
WN-2B	5.64	581.18	5.60	581.22	5.69	581.13	5.71	581.11
WN-2C	5.83	581.04	5.87	581.00	5.90	580.97	5.90	580.97
WN-2D	6.04	580.82	6.12	580.74	6.08	580.78	6.09	580.77
WN-2E	6.26	580.77	6.31	580.72	6.27	580.76	6.32	580.71

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	10/30/00		*10/31/00*		*11/1/00*		*11/2/00*	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	5.96	581.13	6.90	580.19	6.87	580.22	6.90	580.19
WN-3A	6.12	581.12	6.18	581.06	6.09	581.15	6.22	581.02
WN-3B	6.11	581.11	6.19	581.03	6.13	581.09	6.24	580.98
WN-3C	6.11	581.11	6.23	580.99	6.21	581.01	6.28	580.94
WN-3D	6.11	581.10	6.28	580.93	6.26	580.95	6.32	580.89
WN-3E	6.11	581.12	6.27	580.96	6.25	580.98	6.31	580.92
ER-Unit								
EW-1	6.98	580.10	7.02	580.06	6.98	580.10	6.95	580.13
EW-2	7.05	580.35	7.08	580.32	7.04	580.36	7.00	580.40
EW-3	8.08	579.18	8.10	579.16	8.26	579.00	8.26	579.00
RW-1	6.07	581.21	6.10	581.18	6.98	580.30	6.06	581.22
RW-2	6.05	581.23	6.11	581.17	6.92	580.36	6.06	581.22
RW-3	6.10	581.23	6.14	581.19	6.90	580.43	6.09	581.24
RW-4	5.18	582.01	5.18	582.01	5.20	581.99	5.26	581.93
RW-5	5.12	582.26	5.08	582.30	5.12	582.26	5.18	582.20
RW-6	5.67	581.69	5.68	581.68	5.72	581.64	5.75	581.61
WN-1A	5.89	581.12	5.92	581.09	5.95	581.06	5.97	581.04
WN-1B	5.91	581.11	5.95	581.07	5.97	581.05	6.00	581.02
WN-1C	5.98	581.06	6.04	581.00	6.08	580.96	6.09	580.95
WN-1D	6.02	580.99	6.06	580.95	6.12	580.89	6.11	580.90
WN-1E	6.06	580.95	6.11	580.90	6.31	580.70	6.14	580.87
WN-2A	5.66	581.12	5.69	581.09	5.72	581.06	5.73	581.05
WN-2B	5.73	581.09	5.75	581.07	5.80	581.02	5.79	581.03
WN-2C	5.92	580.95	5.93	580.94	5.92	580.95	5.97	580.90
WN-2D	6.15	580.71	6.14	580.72	6.17	580.69	6.18	580.68
WN-2E	6.35	580.68	6.36	580.67	6.39	580.64	6.39	580.64

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	11/3/00		11/4/00		11/5/00		11/6/00	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	7.14	579.95	7.15	579.94	7.14	579.95	7.14	579.95
WN-3A	6.26	580.98	6.28	580.96	6.29	580.95	6.31	580.93
WN-3B	6.27	580.95	6.29	580.93	6.30	580.92	6.32	580.90
WN-3C	6.32	580.90	6.34	580.88	6.35	580.87	6.38	580.84
WN-3D	6.37	580.84	6.37	580.84	6.40	580.81	6.43	580.78
WN-3E	6.38	580.85	6.36	580.87	6.41	580.82	6.41	580.82
ER-Unit								
EW-1	6.86	580.22	6.92	580.16	7.24	579.84	7.19	579.89
EW-2	6.91	580.49	6.98	580.42	7.30	580.10	7.25	580.15
EW-3	8.04	579.22	8.57	578.69	8.52	578.74	8.49	578.77
RW-1	6.04	581.24	6.18	581.10	6.25	581.03	6.24	581.04
RW-2	6.17	581.11	6.20	581.08	6.25	581.03	6.25	581.03
RW-3	6.19	581.14	6.22	581.11	6.28	581.05	6.28	581.05
RW-4	5.27	581.92	5.28	581.91	5.28	581.91	5.32	581.87
RW-5	5.17	582.21	5.17	582.21	5.17	582.21	5.27	582.11
RW-6	5.76	581.60	5.80	581.56	5.82	581.54	5.84	581.52
WN-1A	6.00	581.01	6.02	580.99	6.03	580.98	6.07	580.94
WN-1B	6.02	581.00	6.05	580.97	6.08	580.94	6.09	580.93
WN-1C	6.08	580.96	6.12	580.92	6.18	580.86	6.20	580.84
WN-1D	6.10	580.91	6.13	580.88	6.22	580.79	6.23	580.78
WN-1E	6.12	580.89	6.15	580.86	6.28	580.73	6.27	580.74
WN-2A	5.75	581.03	5.79	580.99	5.81	580.97	5.83	580.95
WN-2B	5.81	581.01	5.87	580.95	5.88	580.94	5.89	580.93
WN-2C	5.95	580.92	6.01	580.86	6.07	580.80	6.08	580.79
WN-2D	6.13	580.73	6.18	580.68	6.32	580.54	6.30	580.56
WN-2E	6.36	580.67	6.37	580.66	6.53	580.50	6.54	580.49

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	11/7/00		11/8/00		11/9/00		11/10/00	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	7.15	579.94	N/A		N/A		N/A	
WN-3A	6.32	580.92	N/A		N/A		N/A	
WN-3B	6.34	580.88	N/A		N/A		N/A	
WN-3C	6.40	580.82	N/A		N/A		N/A	
WN-3D	6.44	580.77	N/A		N/A		N/A	
WN-3E	6.42	580.81	N/A		N/A		N/A	
ER-Unit								
EW-1	7.05	580.03	7.07	580.01	6.95	580.13	6.98	580.10
EW-2	7.11	580.29	7.12	580.28	7.01	580.39	7.08	580.32
EW-3	8.31	578.95	8.32	578.94	8.23	579.03	8.27	578.99
RW-1	6.19	581.09	6.08	581.20	5.97	581.31	5.90	581.38
RW-2	6.19	581.09	6.09	581.19	5.98	581.30	5.89	581.39
RW-3	6.21	581.12	6.10	581.23	5.90	581.43	5.88	581.45
RW-4	5.27	581.92	5.15	582.04	5.03	582.16	4.85	582.34
RW-5	5.21	582.17	5.09	582.29	4.88	582.50	4.69	582.69
RW-6	5.73	581.63	5.61	581.75	5.49	581.87	5.37	581.99
WN-1A	5.98	581.03	5.97	581.04	5.87	581.14	5.90	581.11
WN-1B	5.99	581.03	5.99	581.03	5.90	581.12	5.92	581.10
WN-1C	6.09	580.95	6.08	580.96	5.99	581.05	6.01	581.03
WN-1D	6.12	580.89	6.12	580.89	6.00	581.01	6.03	580.98
WN-1E	6.16	580.85	6.16	580.85	6.06	580.95	6.08	580.93
WN-2A	5.73	581.05	5.73	581.05	5.62	581.16	5.65	581.13
WN-2B	5.79	581.03	5.80	581.02	5.69	581.13	5.74	581.08
WN-2C	5.97	580.90	5.96	580.91	5.87	581.00	5.91	580.96
WN-2D	6.18	580.68	6.18	580.68	6.09	580.77	6.14	580.72
WN-2E	6.41	580.62	6.40	580.63	6.31	580.72	6.36	580.67

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	11/11/00		11/12/00		11/13/00		11/14/00	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	N/A		N/A		5.65	581.44	6.17	580.92
WN-3A	N/A		N/A		5.80	581.44	5.80	581.44
WN-3B	N/A		N/A		5.78	581.44	5.80	581.42
WN-3C	N/A		N/A		5.76	581.46	5.81	581.41
WN-3D	N/A		N/A		5.79	581.42	5.85	581.36
WN-3E	N/A		N/A		5.79	581.44	5.85	581.38
ER-Unit								
EW-1	6.72	580.36	6.69	580.39	6.58	580.50	6.53	580.55
EW-2	6.78	580.62	6.75	580.65	6.70	580.70	6.69	580.71
EW-3	8.02	579.24	8.14	579.12	8.00	579.26	7.97	579.29
RW-1	N/A		5.75	581.53	5.74	581.54	5.72	581.56
RW-2	N/A		5.74	581.54	5.75	581.53	5.72	581.56
RW-3	N/A		5.78	581.55	5.77	581.56	5.74	581.59
RW-4	N/A		4.62	582.57	4.63	582.56	4.62	582.57
RW-5	N/A		4.52	582.86	4.53	582.85	4.51	582.87
RW-6	N/A		5.13	582.23	5.15	582.21	5.14	582.22
WN-1A	5.56	581.45	5.56	581.45	5.56	581.45	5.54	581.47
WN-1B	5.59	581.43	5.58	581.44	5.58	581.44	5.56	581.46
WN-1C	5.69	581.35	5.68	581.36	5.68	581.36	5.64	581.40
WN-1D	5.71	581.30	5.71	581.30	5.71	581.30	5.68	581.33
WN-1E	5.76	581.25	5.75	581.26	5.75	581.26	5.72	581.29
WN-2A	5.32	581.46	5.22	581.56	5.34	581.44	5.32	581.46
WN-2B	5.39	581.43	5.38	581.44	5.39	581.43	5.35	581.47
WN-2C	5.57	581.30	5.58	581.29	5.57	581.30	5.54	581.33
WN-2D	5.80	581.06	5.80	581.06	5.77	581.09	5.73	581.13
WN-2E	6.03	581.00	6.04	580.99	6.00	581.03	5.96	581.07

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	11/15/00		*11/16/00*		*11/17/00*		*11/18/00*	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	5.67	581.42	6.14	580.95	6.19	580.90	6.18	580.91
WN-3A	5.85	581.39	5.82	581.42	5.88	581.36	5.86	581.38
WN-3B	5.81	581.41	5.82	581.40	5.87	581.35	5.86	581.36
WN-3C	5.79	581.43	5.83	581.39	5.89	581.33	5.89	581.33
WN-3D	5.80	581.41	5.86	581.35	5.91	581.30	5.88	581.33
WN-3E	5.81	581.42	5.85	581.38	5.92	581.31	5.90	581.33
ER-Unit								
EW-1	6.59	580.49	6.60	580.48	6.78	580.30	6.76	580.32
EW-2	6.72	580.68	6.70	580.70	6.86	580.54	6.84	580.56
EW-3	8.01	579.25	7.99	579.27	8.14	579.12	8.12	579.14
RW-1	5.72	581.56	5.71	581.57	5.72	581.56	5.70	581.58
RW-2	5.73	581.55	5.72	581.56	5.75	581.53	5.74	581.54
RW-3	5.75	581.58	5.75	581.58	5.77	581.56	5.76	581.57
RW-4	4.63	582.56	N/A		N/A		N/A	
RW-5	4.53	582.85	N/A		N/A		N/A	
RW-6	5.15	582.21	N/A		N/A		N/A	
WN-1A	5.58	581.43	5.59	581.42	5.63	581.38	5.64	581.37
WN-1B	5.61	581.41	5.64	581.38	5.69	581.33	5.67	581.35
WN-1C	5.69	581.35	5.73	581.31	5.77	581.27	5.75	581.29
WN-1D	5.74	581.27	5.77	581.24	5.81	581.20	5.80	581.21
WN-1E	5.77	581.24	5.82	581.19	5.85	581.16	5.86	581.15
WN-2A	5.37	581.41	5.34	581.44	5.42	581.36	5.40	581.38
WN-2B	5.42	581.40	5.36	581.46	5.50	581.32	5.50	581.32
WN-2C	5.59	581.28	5.54	581.33	5.69	581.18	5.67	581.20
WN-2D	6.01	580.85	5.72	581.14	5.91	580.95	5.92	580.94
WN-2E	6.02	581.01	5.94	581.09	6.03	581.00	6.04	580.99

TABLE 4.3

SUMMARY OF PILOT PROJECT GROUNDWATER ELEVATION DATA
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	11/19/00		11/20/00		11/27/00		12/8/00	
Monitoring Location	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*	*Depth to Water (feet btoc)*	*Groundwater Elevation (feet AMSL)*
E-Unit								
EW-4	6.23	580.86	6.23	580.86	5.96	581.13	6.28	580.81
WN-3A	5.92	581.32	5.95	581.29	6.09	581.15	6.41	580.83
WN-3B	5.93	581.29	5.95	581.27	6.09	581.13	6.39	580.83
WN-3C	5.94	581.28	5.98	581.24	6.08	581.14	6.39	580.83
WN-3D	5.98	581.23	5.99	581.22	6.09	581.12	6.40	580.81
WN-3E	5.97	581.26	6.01	581.22	6.09	581.14	6.40	580.83
ER-Unit								
EW-1	6.93	580.15	6.85	580.23	5.93	581.15	6.22	580.86
EW-2	7.00	580.40	6.95	580.45	6.35	581.05	6.52	580.88
EW-3	8.36	578.90	8.19	579.07	6.09	581.17	6.44	580.82
RW-1	5.91	581.37	5.90	581.38	6.14	581.14	6.45	580.83
RW-2	5.89	581.39	5.91	581.37	6.15	581.13	6.45	580.83
RW-3	5.90	581.43	5.92	581.41	6.18	581.15	6.48	580.85
RW-4	4.59	582.60	4.66	582.53	6.05	581.14	6.36	580.83
RW-5	4.34	583.04	4.48	582.90	6.22	581.16	6.57	580.81
RW-6	5.29	582.07	4.36	583.00	6.32	581.04	6.55	580.81
WN-1A	5.70	581.31	5.72	581.29	6.87	580.14	6.20	580.81
WN-1B	5.72	581.30	5.76	581.26	6.88	580.14	6.19	580.83
WN-1C	5.83	581.21	5.85	581.19	6.90	580.14	6.20	580.84
WN-1D	5.88	581.13	5.88	581.13	6.87	580.14	6.19	580.82
WN-1E	5.92	581.09	5.92	581.09	6.86	580.15	6.18	580.83
WN-2A	5.45	581.33	5.48	581.30	5.64	581.14	5.95	580.83
WN-2B	5.54	581.28	5.55	581.27	5.68	581.14	5.99	580.83
WN-2C	5.73	581.14	5.73	581.14	5.74	581.13	6.06	580.81
WN-2D	5.97	580.89	5.97	580.89	5.72	581.14	6.03	580.83
WN-2E	6.22	580.81	6.18	580.85	5.90	581.13	6.19	580.84

[1] AMSL - Above Mean Sea Level

[2] btoc - below top of casing

[3] Not Available

TABLE 4.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
EW-1	GW-100900-WP-042	10/9/2000	16.5	0.64	246	8.81	12.22	2.33
EW-1	GW-101100-WP-070	10/11/2000	13.89	0.45	31	8.73	12.87	1.94
EW-1	GW-101400-WP-108	10/14/2000	12.68	0.2	122	8.85	11.94	2.48
EW-1	GW-101700-WP-153	10/17/2000	5.54	0.07	85	8.92	12.54	3.15
EW-1	GW-101800-WP-165	10/18/2000	3.31	0.46	204	8.94	12.53	4.1
EW-1	GW-101900-WP-171	10/19/2000	2.62	0.31	200	8.97	13.13	3.54
EW-1	GW-102000-WP-195	10/20/2000	1.9	0.13	36	8.99	13.17	5.11
EW-1	GW-102100-WP-201	10/21/2000	1.55	0.1	104	8.99	13.45	3.48
EW-1	GW-102200-WP-220	10/22/2000	1.411	0.15	18	8.89	13.14	3.27
EW-1	GW-102300-WP-234	10/23/2000	1.443	0.38	282	8.79	14.55	16.7
EW-1	GW-102400-WP-248	10/24/2000	1.311	0.18	163	8.86	12.68	25.6
EW-1	GW-102500-WP-261	10/25/2000	1.166	0.2	130	8.87	12.55	5.21
EW-1	GW-102600-WP-280	10/26/2000	1.066	0.23	126	8.82	12.88	5.28
EW-1	GW-102700-WP-299	10/27/2000	0.99	0.39	151	8.76	13.09	3.42
EW-1	GW-102800-WP-318	10/28/2000	0.881	0.4	123	8.79	12.24	4.32
EW-1	GW-102900-WP-337	10/29/2000	0.956	0.06	42	8.80	13.01	10.1
EW-1	GW-103000-WP-353	10/30/2000	0.89	0.14	93	8.88	12.53	2.38
EW-1	GW-103100-WP-381	10/31/2000	0.926	0.11	43	8.54	13.43	2.23
EW-1	GW-110100-WP-394	11/1/2000	0.844	0.12	-12	8.56	14.09	1.76
EW-1	GW-110200-WP-414	11/2/2000	0.787	0.14	-15	8.54	14.11	1.69
EW-1	GW-110300-WP-427	11/3/2000	0.779	0.07	2	8.61	13.99	11.9
EW-1	GW-110400-WP-440	11/4/2000	0.577	0.11	58	8.60	13.73	2.1
EW-1	GW-110500-WP-460	11/5/2000	0.708	0.1	-18	8.59	14.05	1.83
EW-1	GW-110600-WP-468	11/6/2000	0.73	0.25	136	8.61	13.05	1.82
EW-1	GW-110700-WP-486	11/7/2000	0.747	0.22	70	8.64	13.02	2.53
EW-1	GW-110800-WP-499	11/8/2000	0.796	0.21	83	8.48	13.19	3.68
EW-1	GW-110900-WP-513	11/9/2000	0.777	0.22	98	8.55	11.33	2.1
EW-1	GW-111000-WP-526	11/10/2000	0.711	0.18	31	8.56	11.97	2.76
EW-1	GW-111100-WP-540	11/11/2000	0.727	0.15	12	8.36	12.64	1.72
EW-1	GW-111200-WP-553	11/12/2000	0.75	0.1	41	8.43	12.15	1.29
EW-1	GW-111300-WP-572	11/13/2000	0.716	0.29	84	8.36	10.91	2.01
EW-1	GW-111400-WP-586	11/14/2000	0.701	0.23	116	8.36	11.06	1.86
EW-1	GW-111500-WP-599	11/15/2000	0.694	0.27	39	8.33	11.88	3.29
EW-1	GW-111600-WP-619	11/16/2000	0.715	0.28	86	8.41	10.92	2.06
EW-1	GW-111700-WP-632	11/17/2000	0.729	0.25	93	8.33	10.63	3.42
EW-1	GW-111800-WP-646	11/18/2000	0.729	0.28	93	8.30	10.62	3.35
EW-1	GW-111900-WP-664	11/19/2000	0.761	0.11	-24	8.31	11.58	1.09
EW-1	GW-112000-WP-678	11/20/2000	0.886	0.08	191	9.15	10.14	2.2

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
EW-2	GW-100900-WP-043	10/9/2000	12.74	0.3	178	8.78	12.54	2.03
EW-2	GW-101100-WP-071	10/11/2000	11.27	0.34	17	8.71	13.24	1.71
EW-2	GW-101400-WP-109	10/14/2000	10.23	0.18	105	8.78	12.21	1.41
EW-2	GW-101700-WP-154	10/17/2000	8.66	0.05	48	8.79	12.85	1.63
EW-2	GW-101900-WP-172	10/19/2000	6.87	0.17	97	8.81	13.35	1.91
EW-2	GW-102100-WP-202	10/21/2000	5.61	0.05	64	8.84	13.45	1.72
EW-2	GW-102300-WP-235	10/23/2000	5.78	0.29	265	8.69	15.06	2.79
EW-2	GW-102400-WP-249	10/24/2000	5.59	0.26	159	8.76	12.67	2.22
EW-2	GW-102500-WP-262	10/25/2000	5.9	0.16	127	8.80	12.31	2.06
EW-2	GW-102600-WP-281	10/26/2000	5.19	0.12	120	8.78	12.8	2.13
EW-2	GW-102700-WP-300	10/27/2000	4.93	0.06	82	8.75	13.09	2.5
EW-2	GW-102800-WP-319	10/28/2000	4.08	0.47	88	8.78	12.16	4.32
EW-2	GW-102900-WP-338	10/29/2000	4.64	0.09	53	8.79	12.73	1.57
EW-2	GW-103000-WP-354	10/30/2000	4.5	0.09	69	8.84	12.3	1.6
EW-2	GW-103100-WP-382	10/31/2000	4.29	0.1	18	8.64	13.38	1.42
EW-2	GW-110100-WP-395	11/1/2000	4.32	0.06	-24	8.66	14.13	1.56
EW-2	GW-110200-WP-415	11/2/2000	4.28	0.1	-20	8.62	14.16	1.58
EW-2	GW-110300-WP-428	11/3/2000	4.03	0.05	15	8.66	14.12	2.21
EW-2	GW-110400-WP-441	11/4/2000	0.13	0.08	37	8.72	13.77	1.62
EW-2	GW-110500-WP-461	11/5/2000	3.82	0.09	-26	8.69	13.91	1.49
EW-2	GW-110600-WP-469	11/6/2000	3.66	0.27	96	8.71	12.88	1.59
EW-2	GW-110700-WP-487	11/7/2000	3.61	0.2	60	8.75	12.81	1.33
EW-2	GW-110800-WP-500	11/8/2000	3.58	0.23	88	8.69	13.08	2.27
EW-2	GW-110900-WP-514	11/9/2000	3.62	0.12	70	8.81	11	2.29
EW-2	GW-111000-WP-527	11/10/2000	3.49	0.32	-2	8.78	11.75	2.31
EW-2	GW-111100-WP-541	11/11/2000	3.56	0.07	-8	8.57	12.41	2.68
EW-2	GW-111200-WP-554	11/12/2000	3.55	0.08	7	8.54	11.9	1.21
EW-2	GW-111300-WP-573	11/13/2000	3.42	0.33	63	8.62	10.91	1.26
EW-2	GW-111400-WP-587	11/14/2000	3.31	0.14	98	8.63	10.88	1.78
EW-2	GW-111500-WP-600	11/15/2000	3.38	0.11	14	8.55	11.84	2
EW-2	GW-111600-WP-620	11/16/2000	3.05	0.3	65	8.60	10.92	1.32
EW-2	GW-111700-WP-633	11/17/2000	3.26	0.19	-6	8.60	10.79	1.42
EW-2	GW-111800-WP-647	11/18/2000	3.26	0.24	-10	8.56	10.79	1.42
EW-2	GW-111900-WP-665	11/19/2000	3.17	0.14	-43	8.61	11.27	1.03
EW-2	GW-112000-WP-679	11/20/2000	3.52	0.17	-202	9.41	10.12	1.43
EW-3	GW-100900-WP-044	10/9/2000	13.9	0.32	155	8.81	12.12	3.22
EW-3	GW-101100-WP-072	10/11/2000	11.85	0.28	17	8.75	12.87	2.36
EW-3	GW-101400-WP-110	10/14/2000	10.92	0.29	72	8.82	12.4	1.87

TABLE 4.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	Sample Name	Date	Conductivity (ms/cm) [1]	Dissolved Oxygen (mg/L) [2]	ORP (millivolts)	pH (std. units) [3]	Temperature (Celsius)	Turbidity (NTU) [4]
EW-3	GW-101700-WP-152	10/17/2000	10.32	0.13	152	8.80	12.73	1.52
EW-3	GW-101900-WP-173	10/19/2000	8.29	0.09	45	8.84	12.84	1.61
EW-3	GW-102100-WP-203	10/21/2000	6.48	0.03	2	8.85	13.09	1.89
EW-3	GW-102300-WP-236	10/23/2000	5.38	0.37	249	8.70	15.02	3.09
EW-3	GW-102400-WP-250	10/24/2000	6.36	0.13	150	8.79	12.39	5.2
EW-3	GW-102500-WP-263	10/25/2000	5.54	0.29	133	8.78	12.54	2.99
EW-3	GW-102600-WP-282	10/26/2000	5.58	0.08	115	8.80	12.57	2.42
EW-3	GW-102700-WP-301	10/27/2000	3.52	0.11	79	8.75	13.12	2.49
EW-3	GW-102800-WP-320	10/28/2000	1.37	0.07	19	8.80	12.19	3.49
EW-3	GW-102900-WP-339	10/29/2000	4.82	0.4	51	8.80	12.85	1.75
EW-3	GW-103000-WP-355	10/30/2000	4.6	0.1	32	8.85	12.23	1.73
EW-3	GW-103100-WP-383	10/31/2000	4.6	0.12	8	8.67	13.21	1.62
EW-3	GW-110100-WP-396	11/1/2000	4.17	0.36	-18	8.68	13.76	1.51
EW-3	GW-110200-WP-416	11/2/2000	4.24	0.29	-20	8.71	13.81	1.49
EW-3	GW-110300-WP-429	11/3/2000	3.97	0.08	30	8.64	13.83	2.13
EW-3	GW-110400-WP-442	11/4/2000	3.96	0.08	8	8.73	13.61	1.5
EW-3	GW-110500-WP-462	11/5/2000	3.99	0.11	-28	8.73	13.83	1.84
EW-3	GW-110600-WP-470	11/6/2000	3.89	0.16	78	8.73	12.75	1.72
EW-3	GW-110700-WP-488	11/7/2000	3.8	0.12	46	8.77	12.81	1.66
EW-3	GW-110800-WP-501	11/8/2000	3.69	0.11	66	8.78	12.88	1.85
EW-3	GW-110900-WP-515	11/9/2000	3.75	0.12	42	8.82	11.35	1.8
EW-3	GW-111000-WP-528	11/10/2000	3.72	0.11	-39	8.79	12.14	2.17
EW-3	GW-111100-WP-542	11/11/2000	3.71	0.35	-17	8.59	12.39	0.87
EW-3	GW-111200-WP-555	11/12/2000	3.66	0.14	-12	8.65	12.07	1.28
EW-3	GW-111300-WP-574	11/13/2000	3.51	0.19	42	8.66	11.28	1.42
EW-3	GW-111400-WP-588	11/14/2000	3.5	0.19	75	8.66	11.21	1.36
EW-3	GW-111500-WP-601	11/15/2000	3.54	0.14	-3	8.61	12.11	1.63
EW-3	GW-111600-WP-621	11/16/2000	3.25	0.21	44	8.71	11.32	1.42
EW-3	GW-111700-WP-634	11/17/2000	3.45	0.03	-22	8.66	10.83	2.09
EW-3	GW-111800-WP-648	11/18/2000	3.45	0.05	-21	8.69	10.84	2.12
EW-3	GW-111900-WP-649	11/19/2000	0.784	0.31	236	6.63	12.86	0.82
EW-3	GW-111900-WP-666	11/19/2000	3.41	0.16	-51	8.65	11.24	0.84
EW-3	GW-112000-WP-680	11/20/2000	3.84	0.2	-218	9.45	10.48	1.26
EW-4	GW-100200-WP-007	10/2/2000	9.8	0.94	102	8.67	14.2	-
EW-4	GW-100500-WP-014	10/5/2000	7.29	2.51	215	8.75	12.38	-
EW-4	GW-100700-WP-020	10/7/2000	4.99	0.73	213	8.74	11.4	1.23
EW-4	GW-101600-WP-136	10/16/2000	3.06	0.32	70	8.80	12.25	5.6
EW-4	GW-101900-WP-174	10/19/2000	2.59	0.09	21	8.66	13.34	0.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
EW-4	GW-102100-WP-204	10/21/2000	2.30	0.03	-25	8.63	13.38	1.89
EW-4	GW-103000-WP-346	10/30/2000	2.55	0.11	4	8.62	13.22	1.47
EW-4	GW-110200-WP-403	11/2/2000	2.63	0.11	37	8.50	12.66	0.49
EW-4	GW-110500-WP-449	11/5/2000	2.49	0.07	137	8.49	12.64	0.66
EW-4	GW-111300-WP-561	11/13/2000	2.66	0.22	185	8.37	8.88	2.89
EW-4	GW-111600-WP-608	11/16/2000	2.49	0.08	38	8.39	8.55	1.43
EW-4	GW-112000-WP-667	11/20/2000	2.42	0.26	201	8.34	7.64	0.45
RW-1	GW-102300-WP-231	10/23/2000	0.275	10.6	283	7.75	14.54	0.71
RW-2	GW-102300-WP-232	10/23/2000	0.272	9.9	316	7.68	14.75	1.88
RW-3	GW-102300-WP-233	10/23/2000	0.271	9.92	348	7.71	14.72	0.78
WN-1A	GW-100800-WP-021	10/8/2000	1.38	1	205	7.27	12.73	9.28
WN-1A	GW-100900-WP-041	10/9/2000	-	0.68	150	7.25	12.73	3.28
WN-1A	GW-100900-WP-045	10/9/2000	1.299	0.52	247	7.08	13.1	2.04
WN-1A	GW-101000-WP-050	10/10/2000	1.236	0.68	237	7.19	12.63	2.59
WN-1A	GW-101000-WP-055	10/10/2000	1.257	0.53	229	7.06	12.54	2.37
WN-1A	GW-101100-WP-060	10/11/2000	1.113	0.54	213	7.16	12.82	2.09
WN-1A	GW-101100-WP-073	10/11/2000	1.233	0.48	237	7.25	12.34	1.84
WN-1A	GW-101200-WP-078	10/12/2000	1.12	0.47	255	7.21	12.9	1.44
WN-1A	GW-101200-WP-083	10/12/2000	1.177	0.57	310	7.09	13.57	1.99
WN-1A	GW-101300-WP-088	10/13/2000	1.08	0.3	263	7.13	13.14	1.37
WN-1A	GW-101300-WP-098	10/13/2000	1.078	0.55	254	7.01	13.69	1.79
WN-1A	GW-101400-WP-103	10/14/2000	1.057	0.5	261	7.07	13.22	5.48
WN-1A	GW-101400-WP-111	10/14/2000	1.021	0.58	236	7.03	13.4	3.72
WN-1A	GW-101500-WP-116	10/15/2000	1.62	0.51	265	7.11	13.12	1.04
WN-1A	GW-101500-WP-126	10/15/2000	1.021	0.52	279	7.07	13.12	1.5
WN-1A	GW-101600-WP-131	10/16/2000	0.969	0.61	239	7.13	12.95	0.69
WN-1A	GW-101600-WP-142	10/16/2000	0.975	0.38	211	7.08	13.18	1.2
WN-1A	GW-101700-WP-147	10/17/2000	0.988	0.38	200	6.98	13.27	0.83
WN-1A	GW-101800-WP-155	10/18/2000	0.984	0.53	262	6.98	12.71	1.81
WN-1A	GW-101800-WP-166	10/18/2000	0.962	0.39	200	6.92	13.37	4.1
WN-1A	GW-101900-WP-180	10/19/2000	0.975	0.25	142	6.90	13.52	0.95
WN-1A	GW-102000-WP-190	10/20/2000	1.055	0.33	90	7.18	13.5	2.12
WN-1A	GW-102100-WP-196	10/21/2000	0.885	0.27	233	7.02	13.24	5.11
WN-1A	GW-102200-WP-210	10/22/2000	1.034	0.2	146	6.99	13.23	1.43
WN-1A	GW-102300-WP-221	10/23/2000	0.942	0.29	256	6.89	13.36	0.73
WN-1A	GW-102400-WP-238	10/24/2000	0.985	0.38	304	6.90	13.39	4.48
WN-1A	GW-102500-WP-251	10/25/2000	0.94	0.26	274	6.97	13.21	1.59
WN-1A	GW-102500-WP-265	10/25/2000	0.928	0.38	270	6.87	13.33	3.25

TABLE 4.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
WN-1A	GW-102600-WP-270	10/26/2000	0.922	0.38	318	6.93	13.29	1.97
WN-1A	GW-102600-WP-284	10/26/2000	0.963	0.23	216	6.81	13.77	2.09
WN-1A	GW-102700-WP-289	10/27/2000	0.927	0.32	298	6.87	13.26	1.2
WN-1A	GW-102700-WP-303	10/27/2000	0.935	0.34	294	6.86	13.22	2.48
WN-1A	GW-102800-WP-308	10/28/2000	0.88	0.52	251	7.09	13.2	0.58
WN-1A	GW-102800-WP-322	10/28/2000	0.982	0.54	276	7.06	12.97	2.5
WN-1A	GW-102900-WP-327	10/29/2000	0.898	0.32	277	6.96	13.14	0.66
WN-1A	GW-102900-WP-341	10/29/2000	0.894	0.18	97	6.93	13.09	0.68
WN-1A	GW-103000-WP-347	10/30/2000	0.968	0.3	265	6.98	13.02	0.8
WN-1A	GW-103000-WP-366	10/30/2000	0.928	0.39	239	6.96	13.13	1.48
WN-1A	GW-103100-WP-371	10/31/2000	0.914	0.35	249	6.79	13.51	0.87
WN-1A	GW-110100-WP-384	11/1/2000	896	0.32	243	6.82	13.57	1.65
WN-1A	GW-110200-WP-404	11/2/2000	0.869	0.37	78	6.81	13.49	1.62
WN-1A	GW-110300-WP-417	11/3/2000	0.814	0.27	255	6.84	13.25	2.04
WN-1A	GW-110400-WP-430	11/4/2000	0.835	0.32	289	6.85	13.18	1.39
WN-1A	GW-110500-WP-450	11/5/2000	0.854	0.24	73	6.93	13.34	1.08
WN-1A	GW-110600-WP-471	11/6/2000	0.804	0.37	254	6.77	13.36	4.37
WN-1A	GW-110700-WP-476	11/7/2000	0.864	0.26	265	6.83	13.09	2.62
WN-1A	GW-110800-WP-489	11/8/2000	0.803	0.34	269	6.88	12.96	1.65
WN-1A	GW-110900-WP-503	11/9/2000	0.806	0.26	235	6.86	12.6	3.68
WN-1A	GW-111000-WP-516	11/10/2000	0.834	0.25	255	6.91	12.46	1.73
WN-1A	GW-111100-WP-530	11/11/2000	0.827	0.35	260	6.61	13.11	1.29
WN-1A	GW-111200-WP-543	11/12/2000	0.38	0.37	283	6.62	12.92	0.64
WN-1A	GW-111300-WP-562	11/13/2000	0.806	0.36	178	6.74	12.71	1.39
WN-1A	GW-111400-WP-576	11/14/2000	0.853	0.31	256	6.63	12.51	1.2
WN-1A	GW-111500-WP-589	11/15/2000	0.833	0.24	227	6.63	12.46	1.29
WN-1A	GW-111600-WP-609	11/16/2000	0.84	0.25	225	6.71	12.39	1.24
WN-1A	GW-111700-WP-622	11/17/2000	0.052	0.28	248	6.61	12.00	0.72
WN-1A	GW-111800-WP-636	11/18/2000	0.057	0.22	252	6.65	11.97	0.75
WN-1A	GW-111900-WP-654	11/19/2000	0.911	0.27	50	6.93	12.33	1.13
WN-1A	GW-112000-WP-668	11/20/2000	0.871	0.22	59	6.82	11.94	1.46
WN-1A	GW-112700-WP-694	11/27/2000	0.919	0.15	-155	7.83	12.31	1.61
WN-1A	GW-121800-WP-699	12/18/2000	0.734	0.34	-159	6.94	11.51	1.06
WN-1B	GW-100800-WP-022	10/8/2000	2.01	0.49	179	6.98	11.47	3.95
WN-1B	GW-100900-WP-040	10/9/2000	2.2	0.61	193	6.97	11.57	2.4
WN-1B	GW-100900-WP-046	10/9/2000	2.64	0.52	234	6.95	12.05	4.23
WN-1B	GW-101000-WP-051	10/10/2000	2.37	0.55	213	7.03	11.43	2.59
WN-1B	GW-101000-WP-056	10/10/2000	2.55	0.58	210	7.07	11.69	2.78

TABLE 4.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
WN-1B	GW-101100-WP-061	10/11/2000	2.13	0.48	198	6.99	11.64	1.67
WN-1B	GW-101100-WP-074	10/11/2000	2.07	0.54	176	7.08	11.38	1.98
WN-1B	GW-101200-WP-079	10/12/2000	1.93	0.47	199	6.95	11.74	0.93
WN-1B	GW-101200-WP-084	10/12/2000	1.91	0.49	263	6.89	12.46	1.42
WN-1B	GW-101300-WP-089	10/13/2000	1.75	0.6	229	6.90	12.03	1
WN-1B	GW-101300-WP-099	10/13/2000	1.78	0.53	235	6.88	13.02	0.94
WN-1B	GW-101400-WP-104	10/14/2000	1.65	0.31	194	6.83	12.04	5.51
WN-1B	GW-101400-WP-112	10/14/2000	1.63	0.57	213	6.82	12.41	1.33
WN-1B	GW-101500-WP-117	10/15/2000	1.56	0.48	295	7.01	12.1	1.3
WN-1B	GW-101500-WP-127	10/15/2000	1.57	0.53	263	6.89	12.12	0.94
WN-1B	GW-101600-WP-132	10/16/2000	1.5	0.5	210	6.92	11.9	0.94
WN-1B	GW-101600-WP-143	10/16/2000	1.55	0.58	201	6.87	12.19	0.69
WN-1B	GW-101700-WP-148	10/17/2000	1.461	0.32	194	6.69	12.38	0.74
WN-1B	GW-101800-WP-156	10/18/2000	1.436	0.4	242	6.69	11.84	1.64
WN-1B	GW-101800-WP-167	10/18/2000	1.464	0.45	205	6.64	12.5	4.1
WN-1B	GW-101900-WP-181	10/19/2000	1.394	0.19	144	6.63	12.49	0.97
WN-1B	GW-102000-WP-191	10/20/2000	1.317	0.24	118	6.70	12.57	0.51
WN-1B	GW-102100-WP-197	10/21/2000	1.305	0.28	228	6.76	12.46	0.4
WN-1B	GW-102200-WP-211	10/22/2000	1.423	0.27	161	6.73	12.44	2.43
WN-1B	GW-102300-WP-222	10/23/2000	1.423	0.36	241	6.64	12.59	0.66
WN-1B	GW-102400-WP-239	10/24/2000	1.441	0.39	281	6.64	12.65	1.27
WN-1B	GW-102500-WP-252	10/25/2000	1.44	0.36	267	6.70	12.5	1.01
WN-1B	GW-102500-WP-266	10/25/2000	1.461	0.37	261	6.62	12.62	1.07
WN-1B	GW-102600-WP-271	10/26/2000	1.413	0.37	302	6.68	12.63	1.7
WN-1B	GW-102600-WP-285	10/26/2000	1.424	0.3	217	6.55	13.08	2.29
WN-1B	GW-102700-WP-290	10/27/2000	1.379	0.47	254	6.64	12.61	1.33
WN-1B	GW-102700-WP-304	10/27/2000	1.38	0.44	282	6.64	12.44	1.29
WN-1B	GW-102800-WP-309	10/28/2000	1.36	0.49	249	6.74	12.36	0.67
WN-1B	GW-102800-WP-323	10/28/2000	1.392	0.5	262	6.74	12.38	1.13
WN-1B	GW-102900-WP-328	10/29/2000	1.362	0.4	248	6.69	12.51	0.67
WN-1B	GW-102900-WP-342	10/29/2000	1.382	0.35	112	6.71	12.4	0.69
WN-1B	GW-103000-WP-348	10/30/2000	1.354	0.36	252	6.72	12.47	1.16
WN-1B	GW-103000-WP-367	10/30/2000	1.361	0.41	230	6.70	12.67	0.54
WN-1B	GW-103100-WP-372	10/31/2000	1.348	0.36	237	6.53	13.07	0.59
WN-1B	GW-110100-WP-385	11/1/2000	1.307	0.24	220	6.56	12.91	0.69
WN-1B	GW-110200-WP-405	11/2/2000	1.269	0.18	99	6.54	13.03	0.83
WN-1B	GW-110300-WP-418	11/3/2000	1.228	0.22	221	6.59	12.75	0.93
WN-1B	GW-110400-WP-431	11/4/2000	1.242	0.28	261	6.64	12.72	0.9

TABLE 4.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
WN-1B	GW-110500-WP-451	11/5/2000	1.23	0.22	102	6.62	12.81	0.88
WN-1B	GW-110600-WP-472	11/6/2000	1.238	0.37	239	6.51	12.86	3.25
WN-1B	GW-110700-WP-477	11/7/2000	1.243	0.35	240	6.60	12.64	1.32
WN-1B	GW-110800-WP-490	11/8/2000	1.257	0.35	257	6.68	12.56	2.11
WN-1B	GW-110900-WP-504	11/9/2000	1.175	0.32	220	6.61	12.26	4.2
WN-1B	GW-111000-WP-517	11/10/2000	1.262	0.32	243	6.73	12.06	3.88
WN-1B	GW-111100-WP-531	11/11/2000	1.184	0.27	222	6.40	12.59	1.1
WN-1B	GW-111200-WP-544	11/12/2000	1.226	0.31	255	6.45	12.48	0.68
WN-1B	GW-111300-WP-563	11/13/2000	1.185	0.36	172	6.48	12.24	3.39
WN-1B	GW-111400-WP-577	11/14/2000	1.233	0.33	240	6.50	12.05	5.38
WN-1B	GW-111500-WP-590	11/15/2000	1.177	0.22	204	6.46	11.96	2.65
WN-1B	GW-111600-WP-610	11/16/2000	1.145	0.17	90	6.53	12.12	2.55
WN-1B	GW-111700-WP-623	11/17/2000	0.003	0.27	218	6.54	11.99	0.68
WN-1B	GW-111800-WP-637	11/18/2000	0.011	0.21	224	6.59	11.99	0.64
WN-1B	GW-111900-WP-655	11/19/2000	1.175	0.22	60	6.62	11.97	0.75
WN-1B	GW-112000-WP-669	11/20/2000	1.198	0.21	73	6.66	11.83	0.97
WN-1B	GW-112700-WP-695	11/27/2000	1.298	0.13	-136	7.54	11.9	1.33
WN-1B	GW-121800-WP-700	12/18/2000	1.236	0.34	-130	6.54	10.87	1.32
WN-1C	GW-100800-WP-023	10/8/2000	5.02	0.41	149	8.45	11.07	6.12
WN-1C	GW-100900-WP-039	10/9/2000	4.41	0.46	204	8.43	11.21	3.43
WN-1C	GW-100900-WP-047	10/9/2000	4.79	0.45	203	8.36	11.65	6.26
WN-1C	GW-101000-WP-052	10/10/2000	4.61	0.35	177	8.52	11.15	3.32
WN-1C	GW-101000-WP-057	10/10/2000	4.59	0.54	197	8.62	11.12	7.05
WN-1C	GW-101100-WP-062	10/11/2000	4.37	0.47	166	8.49	11.28	2.84
WN-1C	GW-101100-WP-075	10/11/2000	4.46	0.41	153	8.23	11.27	2.37
WN-1C	GW-101200-WP-080	10/12/2000	4.07	0.35	150	8.60	11.54	2.22
WN-1C	GW-101200-WP-085	10/12/2000	4.24	0.42	206	8.52	12	2
WN-1C	GW-101300-WP-090	10/13/2000	4.58	0.46	177	8.63	11.76	1.67
WN-1C	GW-101300-WP-100	10/13/2000	4.48	0.3	178	8.50	12.5	2.4
WN-1C	GW-101400-WP-105	10/14/2000	4.81	0.45	148	8.66	11.71	3.66
WN-1C	GW-101400-WP-113	10/14/2000	4.86	0.5	141	8.65	12.11	4.66
WN-1C	GW-101500-WP-118	10/15/2000	4.54	0.4	280	8.71	11.73	4.91
WN-1C	GW-101500-WP-128	10/15/2000	4.29	0.56	199	8.84	11.59	6.66
WN-1C	GW-101600-WP-133	10/16/2000	3.09	0.44	182	9.09	11.59	11.9
WN-1C	GW-101600-WP-144	10/16/2000	2.51	0.25	135	9.10	11.9	12.2
WN-1C	GW-101700-WP-149	10/17/2000	1.85	0.13	113	9.21	12.46	0.74
WN-1C	GW-101800-WP-157	10/18/2000	1.52	0.34	164	9.25	11.79	18.3
WN-1C	GW-101800-WP-168	10/18/2000	1.355	0.49	111	9.19	12.5	20

TABLE 4.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
WN-1C	GW-101900-WP-182	10/19/2000	1.012	0.11	45	9.24	12.54	20.4
WN-1C	GW-102000-WP-192	10/20/2000	1.432	0.26	109	9.18	12.54	1.28
WN-1C	GW-102100-WP-198	10/21/2000	0.74	0.26	129	9.39	12.68	18.7
WN-1C	GW-102200-WP-212	10/22/2000	0.746	0.14	70	9.29	12.63	17.4
WN-1C	GW-102300-WP-223	10/23/2000	0.713	0.26	156	9.07	12.9	0.66
WN-1C	GW-102400-WP-240	10/24/2000	0.733	0.34	191	9.08	12.95	18.4
WN-1C	GW-102500-WP-253	10/25/2000	0.747	0.32	160	9.16	12.8	14.2
WN-1C	GW-102500-WP-267	10/25/2000	0.739	0.38	183	9.02	12.94	2.37
WN-1C	GW-102600-WP-272	10/26/2000	0.724	0.31	200	9.09	12.97	12.2
WN-1C	GW-102600-WP-286	10/26/2000	0.732	0.26	142	8.95	13.33	10.9
WN-1C	GW-102700-WP-291	10/27/2000	0.839	0.47	152	8.97	12.88	5.91
WN-1C	GW-102700-WP-305	10/27/2000	0.688	0.49	269	8.62	12.82	8.79
WN-1C	GW-102800-WP-310	10/28/2000	0.716	0.31	153	9.08	12.69	9
WN-1C	GW-102800-WP-324	10/28/2000	0.694	0.39	171	9.12	12.6	11.8
WN-1C	GW-102900-WP-329	10/29/2000	0.726	0.19	131	9.05	12.78	7.53
WN-1C	GW-102900-WP-343	10/29/2000	0.705	0.35	98	8.65	2.71	7.61
WN-1C	GW-103000-WP-349	10/30/2000	0.684	0.38	151	9.08	12.7	8.27
WN-1C	GW-103000-WP-368	10/30/2000	0.682	0.34	127	9.07	12.83	8.06
WN-1C	GW-103100-WP-373	10/31/2000	0.677	0.26	118	8.93	13.25	7.54
WN-1C	GW-110100-WP-386	11/1/2000	0.665	0.21	99	8.94	13.15	7.17
WN-1C	GW-110200-WP-406	11/2/2000	0.622	0.29	-7	8.90	13.16	7.1
WN-1C	GW-110300-WP-419	11/3/2000	0.593	0.28	122	8.93	12.96	7.5
WN-1C	GW-110400-WP-432	11/4/2000	0.603	0.24	155	9.01	12.87	7.56
WN-1C	GW-110500-WP-452	11/5/2000	0.598	0.21	5	8.92	13.02	8.38
WN-1C	GW-110600-WP-473	11/6/2000	0.599	0.32	141	8.85	13.02	5.92
WN-1C	GW-110700-WP-478	11/7/2000	0.589	0.31	143	8.94	12.64	6.58
WN-1C	GW-110800-WP-491	11/8/2000	0.648	0.21	152	8.90	12.62	6.9
WN-1C	GW-110900-WP-505	11/9/2000	0.609	0.31	127	8.97	12.19	6.83
WN-1C	GW-111000-WP-518	11/10/2000	0.608	0.32	152	8.87	12.02	7.27
WN-1C	GW-111100-WP-532	11/11/2000	0.636	0.32	127	8.69	12.5	4.44
WN-1C	GW-111200-WP-545	11/12/2000	0.643	0.29	171	8.69	12.4	6.41
WN-1C	GW-111300-WP-564	11/13/2000	0.635	0.31	90	8.73	12.02	6.13
WN-1C	GW-111400-WP-578	11/14/2000	0.635	0.3	159	8.62	11.88	6.31
WN-1C	GW-111500-WP-591	11/15/2000	0.683	0.22	122	8.64	11.66	5.68
WN-1C	GW-111600-WP-611	11/16/2000	0.812	0.29	5	8.57	11.85	5.72
WN-1C	GW-111700-WP-624	11/17/2000	0.821	0.24	140	8.53	11.93	3.44
WN-1C	GW-111800-WP-638	11/18/2000	0.814	0.19	138	8.61	11.95	3.52
WN-1C	GW-111900-WP-656	11/19/2000	0.944	0.22	-18	8.42	11.66	4.02

GROUNDWATER RESULTS FOR FIELD PARAMETERS
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WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)*[1]	*Dissolved Oxygen (mg/L)*[2]	*ORP (millivolts)*	*pH (std. units)*[3]	*Temperature (Celsius)*	*Turbidity (NTU)*[4]
WN-1C	GW-112000-WP-670	11/20/2000	0.906	0.15	-5	8.51	11.41	3.35
WN-1C	GW-112700-WP-696	11/27/2000	1.046	0.1	-223	9.34	11.4	4.87
WN-1C	GW-121800-WP-701	12/18/2000	0.834	0.19	-214	8.59	10.97	15.6
WN-1D	GW-100800-WP-024	10/8/2000	13.86	0.38	170	8.78	11.02	3.89
WN-1D	GW-100900-WP-038	10/9/2000	12.97	0.46	195	8.78	11.14	4.01
WN-1D	GW-100900-WP-048	10/9/2000	13.27	0.44	210	8.73	11.55	13.6
WN-1D	GW-101000-WP-053	10/10/2000	13.77	0.38	185	8.87	11.15	8.12
WN-1D	GW-101000-WP-058	10/10/2000	13.75	0.32	165	8.85	11.37	12.8
WN-1D	GW-101100-WP-063	10/11/2000	14.25	0.31	161	8.94	11.17	5.56
WN-1D	GW-101100-WP-076	10/11/2000	14.1	0.31	176	8.76	11.2	4.78
WN-1D	GW-101200-WP-081	10/12/2000	14.41	0.27	160	8.97	11.42	2.67
WN-1D	GW-101200-WP-086	10/12/2000	14.8	0.26	196	8.88	11.96	2.11
WN-1D	GW-101300-WP-091	10/13/2000	15	0.49	168	8.93	11.6	2.71
WN-1D	GW-101300-WP-101	10/13/2000	15.4	0.2	171	8.84	12.2	3.31
WN-1D	GW-101400-WP-106	10/14/2000	12.87	0.16	138	9.00	11.65	6.31
WN-1D	GW-101400-WP-114	10/14/2000	7.61	0.35	134	9.03	11.95	16.6
WN-1D	GW-101500-WP-119	10/15/2000	3.09	0.56	202	9.23	11.65	37.3
WN-1D	GW-101500-WP-129	10/15/2000	2.32	0.59	187	9.22	11.51	13.4
WN-1D	GW-101600-WP-134	10/16/2000	1.34	0.61	127	9.35	11.62	38.7
WN-1D	GW-101600-WP-145	10/16/2000	1.068	0.33	134	9.29	11.97	32.4
WN-1D	GW-101700-WP-150	10/17/2000	0.868	0.27	119	9.28	12.37	28.1
WN-1D	GW-101800-WP-158	10/18/2000	0.755	0.67	177	9.28	11.93	26.6
WN-1D	GW-101800-WP-169	10/18/2000	0.714	0.5	123	9.20	12.56	26.1
WN-1D	GW-101900-WP-183	10/19/2000	0.663	0.14	65	9.21	12.82	24.2
WN-1D	GW-102000-WP-193	10/20/2000	0.57	0.34	29	9.21	12.97	23.9
WN-1D	GW-102100-WP-199	10/21/2000	0.536	0.25	151	9.26	12.8	22.9
WN-1D	GW-102200-WP-213	10/22/2000	0.562	0.26	79	9.24	12.96	17
WN-1D	GW-102300-WP-224	10/23/2000	0.525	0.4	10	9.02	13.22	0.66
WN-1D	GW-102400-WP-241	10/24/2000	0.564	0.28	200	9.06	13.17	29.2
WN-1D	GW-102500-WP-254	10/25/2000	0.523	0.31	169	9.10	13.06	30.3
WN-1D	GW-102500-WP-268	10/25/2000	0.514	0.27	192	9.01	13.2	31.9
WN-1D	GW-102600-WP-273	10/26/2000	0.504	0.29	186	9.09	13.21	36.7
WN-1D	GW-102600-WP-287	10/26/2000	0.495	0.22	111	8.99	13.53	35.2
WN-1D	GW-102700-WP-292	10/27/2000	0.525	0.46	157	9.08	13.22	25
WN-1D	GW-102700-WP-306	10/27/2000	0.51	0.45	231	9.03	13.08	23.4
WN-1D	GW-102800-WP-311	10/28/2000	0.501	0.39	155	9.13	1.88	20.9
WN-1D	GW-102800-WP-325	10/28/2000	0.476	0.5	173	9.16	12.85	16.1
WN-1D	GW-102900-WP-330	10/29/2000	0.478	0.26	133	9.10	12.99	21.8

TABLE 4.4

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WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	Sample Name	Date	Conductivity (ms/cm)[1]	Dissolved Oxygen (mg/L)[2]	ORP (millivolts)	pH (std. units)[3]	Temperature (Celsius)	Turbidity (NTU)[4]
WN-1D	GW-102900-WP-344	10/29/2000	0.46	0.48	108	8.47	12.98	22.3
WN-1D	GW-103000-WP-350	10/30/2000	0.469	0.42	153	9.17	12.95	20.6
WN-1D	GW-103000-WP-369	10/30/2000	0.463	0.47	135	9.11	13.05	13.1
WN-1D	GW-103100-WP-374	10/31/2000	0.463	0.37	121	9.00	13.41	6.06
WN-1D	GW-110100-WP-387	11/1/2000	0.587	0.16	107	8.93	13.34	16.4
WN-1D	GW-110200-WP-407	11/2/2000	0.478	0.25	2	8.93	13.42	11.2
WN-1D	GW-110300-WP-420	11/3/2000	0.481	0.27	171	8.98	13.06	14
WN-1D	GW-110400-WP-433	11/4/2000	0.447	0.2	154	9.06	12.94	16.1
WN-1D	GW-110500-WP-453	11/5/2000	0.431	0.22	7	9.00	13.09	12.7
WN-1D	GW-110600-WP-474	11/6/2000	0.464	0.3	138	8.96	13.01	14.5
WN-1D	GW-110700-WP-479	11/7/2000	0.418	0.33	124	9.01	12.71	17.3
WN-1D	GW-110800-WP-492	11/8/2000	0.413	0.17	149	9.01	12.72	24.9
WN-1D	GW-110900-WP-506	11/9/2000	0.414	0.27	109	9.06	12.26	22
WN-1D	GW-111000-WP-519	11/10/2000	0.412	0.26	136	9.06	12.25	25.8
WN-1D	GW-111100-WP-533	11/11/2000	0.427	0.4	125	8.78	12.38	16.8
WN-1D	GW-111200-WP-546	11/12/2000	0.441	0.26	167	8.83	12.4	14
WN-1D	GW-111300-WP-565	11/13/2000	0.431	0.22	80	8.79	11.9	18
WN-1D	GW-111400-WP-579	11/14/2000	0.427	0.34	143	8.77	11.92	18.2
WN-1D	GW-111500-WP-592	11/15/2000	0.421	0.17	94	8.80	11.73	20.3
WN-1D	GW-111600-WP-612	11/16/2000	0.424	0.31	-9	8.80	11.69	19.5
WN-1D	GW-111700-WP-625	11/17/2000	0.421	0.27	122	8.79	11.78	14.0
WN-1D	GW-111800-WP-639	11/18/2000	0.420	0.24	120	8.75	11.76	14.2
WN-1D	GW-111900-WP-657	11/19/2000	0.426	0.2	-31	8.82	11.56	6.39
WN-1D	GW-112000-WP-671	11/20/2000	0.421	0.19	-14	8.85	11.15	12.6
WN-1D	GW-112700-WP-697	11/27/2000	0.523	0.13	-233	9.70	11.33	18.3
WN-1D	GW-121800-WP-702	12/18/2000	0.548	0.21	-216	8.83	10.65	16.4
WN-1E	GW-100800-WP-025	10/8/2000	18.5	0.28	158	8.77	11.8	6.44
WN-1E	GW-100900-WP-037	10/9/2000	18.3	0.48	191	8.81	11.03	4.01
WN-1E	GW-100900-WP-049	10/9/2000	18.9	0.44	210	8.75	11.52	4.49
WN-1E	GW-101000-WP-054	10/10/2000	19.1	0.31	184	8.60	11.17	4.89
WN-1E	GW-101000-WP-059	10/10/2000	18.7	0.43	223	8.72	11.5	5.73
WN-1E	GW-101100-WP-064	10/11/2000	19.5	0.25	148	8.81	11.15	4.62
WN-1E	GW-101100-WP-077	10/11/2000	19.3	0.32	144	0.76	11.2	3.88
WN-1E	GW-101200-WP-082	10/12/2000	19.3	0.36	176	8.84	11.39	14.8
WN-1E	GW-101200-WP-087	10/12/2000	16.3	0.38	182	8.83	11.77	10.8
WN-1E	GW-101300-WP-092	10/13/2000	7.14	0.52	161	8.98	11.55	12.5
WN-1E	GW-101300-WP-102	10/13/2000	5.32	0.26	159	8.88	12.52	39.2
WN-1E	GW-101400-WP-107	10/14/2000	3.36	0.31	121	8.98	11.64	18.5

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Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
WN-1E	GW-101400-WP-115	10/14/2000	2.4	0.7	131	8.97	11.98	13.2
WN-1E	GW-101500-WP-120	10/15/2000	1.97	0.54	206	9.04	11.66	13.3
WN-1E	GW-101500-WP-130	10/15/2000	2.38	0.58	198	8.97	11.48	17
WN-1E	GW-101600-WP-135	10/16/2000	1.485	0.48	145	9.09	11.53	8.93
WN-1E	GW-101600-WP-146	10/16/2000	1.219	1.25	149	9.09	11.84	13.7
WN-1E	GW-101700-WP-151	10/17/2000	1.093	0.33	141	9.04	12.29	14.6
WN-1E	GW-101800-WP-159	10/18/2000	1.098	0.27	190	9.03	11.83	9.41
WN-1E	GW-101800-WP-170	10/18/2000	1.374	0.52	138	8.92	12.33	14.2
WN-1E	GW-101900-WP-184	10/19/2000	0.833	0.15	109	9.01	12.52	4.04
WN-1E	GW-102000-WP-194	10/20/2000	0.676	0.37	45	9.03	12.82	11.1
WN-1E	GW-102100-WP-200	10/21/2000	0.663	0.19	167	9.06	12.55	4.81
WN-1E	GW-102200-WP-214	10/22/2000	0.642	0.21	94	9.03	12.67	5.99
WN-1E	GW-102300-WP-225	10/23/2000	0.625	0.37	185	8.79	12.88	0.85
WN-1E	GW-102400-WP-242	10/24/2000	0.661	0.32	213	8.83	12.81	8.35
WN-1E	GW-102500-WP-255	10/25/2000	0.592	0.26	183	8.88	12.74	7.83
WN-1E	GW-102500-WP-269	10/25/2000	0.597	0.32	204	8.79	12.9	10.1
WN-1E	GW-102600-WP-274	10/26/2000	0.577	0.23	190	8.84	12.91	11.1
WN-1E	GW-102600-WP-288	10/26/2000	0.584	0.21	133	8.72	13.35	9.2
WN-1E	GW-102700-WP-293	10/27/2000	0.662	0.21	203	8.59	12.89	6.02
WN-1E	GW-102700-WP-307	10/27/2000	1.309	0.31	244	6.81	12.16	11.5
WN-1E	GW-102800-WP-312	10/28/2000	0.762	0.36	170	8.85	12.63	7.88
WN-1E	GW-102800-WP-326	10/28/2000	1.335	0.52	198	8.69	12.58	14.7
WN-1E	GW-102900-WP-331	10/29/2000	2.97	0.33	174	8.22	12.76	2.71
WN-1E	GW-102900-WP-345	10/29/2000	2.47	0.46	129	8.27	12.67	2.82
WN-1E	GW-103000-WP-351	10/30/2000	1.9	0.32	181	8.31	12.62	1.25
WN-1E	GW-103000-WP-370	10/30/2000	1.46	0.28	169	8.28	12.77	3.89
WN-1E	GW-103100-WP-375	10/31/2000	1.209	0.27	156	8.13	13.14	5.29
WN-1E	GW-110100-WP-388	11/1/2000	1.317	0.16	130	8.26	13.03	3.24
WN-1E	GW-110200-WP-408	11/2/2000	0.824	0.29	46	8.17	13.2	1.73
WN-1E	GW-110300-WP-421	11/3/2000	0.774	0.26	195	8.19	12.86	1.7
WN-1E	GW-110400-WP-434	11/4/2000	0.665	0.27	180	8.28	12.66	1.88
WN-1E	GW-110500-WP-454	11/5/2000	0.574	0.22	42	8.28	12.87	3.68
WN-1E	GW-110600-WP-475	11/6/2000	0.551	0.34	161	8.24	12.78	1.58
WN-1E	GW-110700-WP-480	11/7/2000	0.527	0.32	141	8.30	12.52	2.33
WN-1E	GW-110800-WP-493	11/8/2000	0.517	0.27	170	8.38	12.51	5.53
WN-1E	GW-110900-WP-507	11/9/2000	0.504	0.22	127	8.38	12	2.15
WN-1E	GW-111000-WP-520	11/10/2000	0.488	0.27	158	8.48	12.02	4.26
WN-1E	GW-111100-WP-534	11/11/2000	0.512	0.37	154	8.17	12.31	3.11

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	Sample Name	Date	Conductivity (ms/cm)[1]	Dissolved Oxygen (mg/L)[2]	ORP (millivolts)	pH (std. units)[3]	Temperature (Celsius)	Turbidity (NTU)[4]
WN-1E	GW-111200-WP-547	11/12/2000	0.48	0.29	184	8.20	12.17	2.28
WN-1E	GW-111300-WP-566	11/13/2000	0.481	0.34	96	8.30	11.6	2.3
WN-1E	GW-111400-WP-580	11/14/2000	0.475	0.3	156	8.29	11.57	2.63
WN-1E	GW-111500-WP-593	11/15/2000	0.466	0.19	104	8.32	11.51	1.98
WN-1E	GW-111600-WP-613	11/16/2000	0.455	0.33	19	8.26	11.59	2.05
WN-1E	GW-111700-WP-626	11/17/2000	0.457	0.26	127	8.52	10.89	4.2
WN-1E	GW-111800-WP-640	11/18/2000	0.453	0.26	125	8.54	10.90	4.6
WN-1E	GW-111900-WP-658	11/19/2000	0.454	0.22	-13	8.44	11.37	2.91
WN-1E	GW-112000-WP-672	11/20/2000	0.456	0.19	5	8.46	10.96	1.1
WN-1E	GW-112700-WP-698	11/27/2000	0.806	0.07	-202	9.26	11.16	1.02
WN-1E	GW-121800-WP-703	12/18/2000	1.462	0.24	-191	8.36	10.31	1.19
WN-2A	GW-100800-WP-026	10/8/2000	1.15	0.48	127	6.99	12.88	8.79
WN-2A	GW-101100-WP-065	10/11/2000	1.029	0.63	215	7.00	12.92	2.93
WN-2A	GW-101300-WP-093	10/13/2000	1.034	0.5	251	6.95	13.63	4.85
WN-2A	GW-101500-WP-121	10/15/2000	1.004	0.54	210	7.03	12.97	5.99
WN-2A	GW-101800-WP-160	10/18/2000	0.989	0.33	185	6.98	13	2.85
WN-2A	GW-102000-WP-185	10/20/2000	0.891	0.32	243	6.92	13.21	1.45
WN-2A	GW-102200-WP-205	10/22/2000	0.983	0.39	278	6.90	13.08	2.76
WN-2A	GW-102300-WP-226	10/23/2000	0.928	0.32	207	6.96	13.26	3.05
WN-2A	GW-102400-WP-243	10/24/2000	0.948	0.36	246	7.01	13.3	10.8
WN-2A	GW-102500-WP-256	10/25/2000	0.937	0.29	221	7.04	13.13	4.69
WN-2A	GW-102600-WP-275	10/26/2000	0.911	0.26	234	7.05	13.18	4.26
WN-2A	GW-102700-WP-294	10/27/2000	0.861	0.29	261	7.05	13.49	3.24
WN-2A	GW-102800-WP-313	10/28/2000	0.85	0.3	191	7.09	12.89	2.09
WN-2A	GW-102900-WP-332	10/29/2000	0.8	0.15	184	7.09	13.02	1.4
WN-2A	GW-103000-WP-356	10/30/2000	0.809	0.24	85	7.18	13.24	2.59
WN-2A	GW-103100-WP-376	10/31/2000	0.805	0.29	168	7.03	13.45	2.57
WN-2A	GW-110100-WP-389	11/1/2000	0.789	0.25	146	7.00	13.51	2.73
WN-2A	GW-110200-WP-409	11/2/2000	0.736	0.19	98	7.05	13.45	2.52
WN-2A	GW-110300-WP-422	11/3/2000	0.713	0.2	195	7.03	13.34	2
WN-2A	GW-110400-WP-435	11/4/2000	0.713	0.18	194	7.05	13.02	1.76
WN-2A	GW-110500-WP-455	11/5/2000	0.703	0.24	99	7.09	13.56	3.17
WN-2A	GW-110600-WP-463	11/6/2000	0.695	0.23	164	7.10	13.11	2.1
WN-2A	GW-110700-WP-481	11/7/2000	0.692	0.3	171	7.10	13.06	3.18
WN-2A	GW-110800-WP-494	11/8/2000	0.699	0.28	185	7.16	13.08	3.96
WN-2A	GW-110900-WP-508	11/9/2000	0.688	0.35	170	7.09	12.45	2.77
WN-2A	GW-111000-WP-521	11/10/2000	0.677	0.35	186	7.16	12.56	3.27
WN-2A	GW-111100-WP-535	11/11/2000	0.68	0.36	165	6.86	13.1	1.63

TABLE 4.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)*[1]	*Dissolved Oxygen (mg/L)*[2]	*ORP (millivolts)*	*pH (std. units)*[3]	*Temperature (Celsius)*	*Turbidity (NTU)*[4]
WN-2A	GW-111200-WP-548	11/12/2000	0.69	0.25	190	6.93	12.8	1.14
WN-2A	GW-111300-WP-567	11/13/2000	0.688	0.29	135	7.20	12.04	8.44
WN-2A	GW-111400-WP-581	11/14/2000	0.718	0.36	183	7.03	12.32	8.07
WN-2A	GW-111500-WP-594	11/15/2000	0.71	0.18	129	7.00	12.28	4.38
WN-2A	GW-111600-WP-614	11/16/2000	0.695	0.27	179	7.04	12.31	8.02
WN-2A	GW-111700-WP-627	11/17/2000	0.695	0.37	157	6.95	12.41	1.31
WN-2A	*GW-111800-WP-641*	*11/18/2000*	*0.695*	*0.30*	*155*	*7.02*	12.43	*1.43*
WN-2A	GW-111900-WP-659	11/19/2000	0.706	0.22	52	7.08	12.5	1.53
WN-2A	GW-112000-WP-673	11/20/2000	0.706	0.27	96	7.00	12.04	3.08
WN-2A	GW-121800-WP-704	12/18/2000	0.845	0.36	146	7.02	10.84	0.94
WN-2B	GW-100800-WP-028	10/8/2000	2.47	0.46	136	7.20	11.56	2.75
WN-2B	GW-101100-WP-066	10/11/2000	2.29	0.48	204	7.03	11.91	2.09
WN-2B	GW-101300-WP-094	10/13/2000	1.94	0.47	222	6.90	12.71	2.67
WN-2B	GW-101500-WP-122	10/15/2000	1.7	0.23	195	6.88	12	3.65
WN-2B	GW-101800-WP-161	10/18/2000	1.47	0.49	175	6.73	12.28	-
WN-2B	GW-102000-WP-186	10/20/2000	1.345	0.33	217	6.72	12.4	1.91
WN-2B	GW-102200-WP-206	10/22/2000	1.432	0.34	240	6.73	12.3	1.77
WN-2B	GW-102300-WP-227	10/23/2000	1.347	0.3	205	6.74	12.35	2.29
WN-2B	GW-102400-WP-244	10/24/2000	1.218	0.27	239	6.72	12.47	4.77
WN-2B	GW-102500-WP-257	10/25/2000	1.194	0.27	216	6.71	12.31	2.25
WN-2B	GW-102600-WP-276	10/26/2000	1.166	0.29	230	6.74	12.58	3.37
WN-2B	GW-102700-WP-295	10/27/2000	1.119	0.26	273	6.81	12.79	4.14
WN-2B	GW-102800-WP-314	10/28/2000	1.048	0.3	270	6.87	12.21	0.92
WN-2B	GW-102900-WP-333	10/29/2000	1.039	0.15	179	6.71	12.45	1.33
WN-2B	GW-103000-WP-357	10/30/2000	1.023	0.2	108	6.72	12.67	1.67
WN-2B	GW-103000-WP-362	10/30/2000	1.51	0.32	96	7.06	13.22	2.13
WN-2B	GW-103100-WP-377	10/31/2000	1.031	0.29	174	6.61	12.96	2.01
WN-2B	GW-110100-WP-390	11/1/2000	0.997	0.35	157	6.55	12.85	0.82
WN-2B	GW-110200-WP-410	11/2/2000	0.965	0.26	113	6.67	12.94	1.63
WN-2B	GW-110300-WP-423	11/3/2000	0.931	0.16	185	6.55	12.94	1.71
WN-2B	GW-110400-WP-436	11/4/2000	0.942	0.32	191	6.53	12.59	0.7
WN-2B	GW-110500-WP-456	11/5/2000	0.944	0.2	124	6.55	13.01	6.61
WN-2B	GW-110600-WP-464	11/6/2000	0.987	0.33	173	6.67	12.76	2.18
WN-2B	GW-110700-WP-482	11/7/2000	0.959	0.19	175	6.57	12.68	1.49
WN-2B	GW-110800-WP-495	11/8/2000	0.979	0.31	185	6.68	12.77	2.81
WN-2B	GW-110900-WP-509	11/9/2000	0.956	0.24	180	6.61	12.22	8.19
WN-2B	GW-111000-WP-522	11/10/2000	0.969	0.32	195	6.69	12.14	6
WN-2B	GW-111100-WP-536	11/11/2000	1.009	0.34	171	6.44	12.7	1.13

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
WN-2B	GW-111200-WP-549	11/12/2000	1.006	0.22	190	6.45	12.54	3.28
WN-2B	GW-111300-WP-568	11/13/2000	0.972	0.28	150	6.62	11.67	5.14
WN-2B	GW-111400-WP-582	11/14/2000	0.984	0.31	187	6.50	11.98	1.09
WN-2B	GW-111500-WP-595	11/15/2000	0.999	0.19	145	6.56	11.97	1.71
WN-2B	GW-111600-WP-615	11/16/2000	0.872	0.3	185	6.54	12.01	1.12
WN-2B	GW-111700-WP-628	11/17/2000	1.297	0.23	164	6.68	11.94	3.13
WN-2B	GW-111800-WP-642	11/18/2000	1.297	0.25	162	6.65	11.95	3.08
WN-2B	GW-111900-WP-660	11/19/2000	1.032	0.22	80	6.56	12.23	2.78
WN-2B	GW-112000-WP-674	11/20/2000	1.015	0.21	114	6.56	11.63	1.89
WN-2B	GW-112700-WP-689	11/27/2000	1.203	0.11	-124	7.45	12.15	1.01
WN-2B	GW-121800-WP-705	12/18/2000	1.18	0.22	139	6.52	11.06	1.49
WN-2C	GW-100800-WP-029	10/8/2000	4.03	0.41	105	8.00	11.32	3.24
WN-2C	GW-101100-WP-067	10/11/2000	2.1	2.4	152	7.28	11.53	2.35
WN-2C	GW-101300-WP-095	10/13/2000	1.82	0.42	196	7.08	12.53	2.09
WN-2C	GW-101500-WP-123	10/15/2000	1.7	0.42	175	7.04	11.73	2.33
WN-2C	GW-101800-WP-162	10/18/2000	1.51	0.17	141	6.80	11.87	1.2
WN-2C	GW-102000-WP-187	10/20/2000	1.43	0.26	184	6.81	12.24	0.99
WN-2C	GW-102200-WP-207	10/22/2000	1.55	0.26	214	6.76	12.1	1.68
WN-2C	GW-102300-WP-228	10/23/2000	1.51	0.38	194	6.75	12.34	1.36
WN-2C	GW-102400-WP-245	10/24/2000	1.49	0.29	229	6.76	12.4	2.18
WN-2C	GW-102500-WP-258	10/25/2000	1.443	0.32	209	6.73	12.24	2.41
WN-2C	GW-102600-WP-277	10/26/2000	1.404	0.37	223	6.73	12.47	4.15
WN-2C	GW-102700-WP-296	10/27/2000	1.358	0.25	280	6.79	12.44	1.74
WN-2C	GW-102800-WP-315	10/28/2000	1.331	0.42	220	6.76	12.22	0.96
WN-2C	GW-102900-WP-334	10/29/2000	1.339	0.25	173	6.78	12.38	1.39
WN-2C	GW-103000-WP-358	10/30/2000	1.316	0.22	113	6.78	12.75	1.64
WN-2C	GW-103100-WP-378	10/31/2000	1.292	0.27	169	6.62	12.91	2.6
WN-2C	GW-110100-WP-391	11/1/2000	1.248	0.24	151	6.66	13.06	1.2
WN-2C	GW-110200-WP-411	11/2/2000	1.221	0.28	117	6.64	13.06	1.67
WN-2C	GW-110300-WP-424	11/3/2000	1.094	0.22	158	6.69	13.01	1.98
WN-2C	GW-110400-WP-437	11/4/2000	1.077	0.24	181	6.72	12.65	2.45
WN-2C	GW-110500-WP-457	11/5/2000	1.118	0.18	124	6.69	13.07	8.26
WN-2C	GW-110600-WP-465	11/6/2000	1.17	0.33	172	6.68	12.83	1.87
WN-2C	GW-110700-WP-483	11/7/2000	1.081	0.17	166	6.75	12.78	2.6
WN-2C	GW-110800-WP-496	11/8/2000	1.154	0.3	180	6.70	12.81	3.08
WN-2C	GW-110900-WP-510	11/9/2000	1.043	0.19	171	6.77	12.36	2.25
WN-2C	GW-111000-WP-523	11/10/2000	1.115	0.34	190	6.79	12.25	2.25
WN-2C	GW-111100-WP-537	11/11/2000	1.082	0.26	162	6.57	1277	1.46

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	Sample Name	Date	Conductivity (ms/cm)[1]	Dissolved Oxygen (mg/L)[2]	ORP (millivolts)	pH (std. units)[3]	Temperature (Celsius)	Turbidity (NTU)[4]
WN-2C	GW-111200-WP-550	11/12/2000	1.117	0.27	178	6.60	12.54	0.94
WN-2C	GW-111300-WP-569	11/13/2000	1.156	0.32	154	6.52	11.43	1.92
WN-2C	GW-111400-WP-583	11/14/2000	1.157	0.25	181	6.53	12.07	1.26
WN-2C	GW-111500-WP-596	11/15/2000	1.081	0.18	143	6.65	11.99	1.48
WN-2C	GW-111600-WP-616	11/16/2000	1.121	0.26	176	6.51	12.1	1.3
WN-2C	GW-111700-WP-629	11/17/2000	1.02	0.17	141	6.61	12.05	2.24
WN-2C	GW-111800-WP-643	11/18/2000	1.02	0.20	142	6.60	12.01	2.14
WN-2C	GW-111900-WP-661	11/19/2000	1.266	0.23	83	6.57	12.03	1.86
WN-2C	GW-112000-WP-675	11/20/2000	1.133	0.28	-82	7.61	11.6	1.48
WN-2C	GW-112700-WP-690	11/27/2000	1.253	0.11	-133	7.65	11.59	1.3
WN-2C	GW-121800-WP-706	12/18/2000	1.228	0.19	134	6.73	10.42	1.8
WN-2D	GW-100800-WP-030	10/8/2000	15.4	0.35	124	8.80	11.25	7.47
WN-2D	GW-101100-WP-068	10/11/2000	5.64	0.43	107	8.71	11.55	12.6
WN-2D	GW-101300-WP-096	10/13/2000	4.38	0.51	156	8.57	12.54	3.89
WN-2D	GW-101500-WP-124	10/15/2000	3.8	0.28	108	8.59	11.54	2.33
WN-2D	GW-101800-WP-163	10/18/2000	3.53	0.15	80	8.56	11.91	3.39
WN-2D	GW-102000-WP-188	10/20/2000	2.49	0.19	103	8.45	12.13	4.28
WN-2D	GW-102200-WP-208	10/22/2000	2.28	0.2	131	8.46	12.01	5.72
WN-2D	GW-102300-WP-229	10/23/2000	2.65	0.27	139	8.42	12.45	6.36
WN-2D	GW-102400-WP-246	10/24/2000	2.18	0.26	170	8.23	12.35	6.54
WN-2D	GW-102500-WP-259	10/25/2000	2.05	0.29	157	8.18	12.3	6.92
WN-2D	GW-102600-WP-278	10/26/2000	1.88	0.28	169	8.07	12.49	8.54
WN-2D	GW-102700-WP-297	10/27/2000	1.64	0.16	291	7.86	12.49	5.42
WN-2D	GW-102800-WP-316	10/28/2000	1.63	0.34	212	7.59	12.26	3.89
WN-2D	GW-102900-WP-335	10/29/2000	1.5	0.12	89	8.14	12.5	5.37
WN-2D	GW-103000-WP-359	10/30/2000	1.53	0.17	73	7.61	12.83	3.32
WN-2D	GW-103100-WP-379	10/31/2000	1.56	0.27	146	7.18	12.97	2.24
WN-2D	GW-110100-WP-392	11/1/2000	1.382	0.12	80	7.68	13.24	4.65
WN-2D	GW-110200-WP-412	11/2/2000	1.483	0.25	99	7.13	13.15	1.78
WN-2D	GW-110300-WP-425	11/3/2000	1.427	0.25	140	6.95	13.23	1.74
WN-2D	GW-110400-WP-438	11/4/2000	1.261	0.32	147	7.40	12.94	4.14
WN-2D	GW-110500-WP-458	11/5/2000	1.254	0.13	96	7.21	13.14	3.77
WN-2D	GW-110600-WP-466	11/6/2000	1.38	0.33	162	7.00	12.84	2.48
WN-2D	GW-110700-WP-484	11/7/2000	1.316	0.16	140	7.14	13.04	10.2
WN-2D	GW-110800-WP-497	11/8/2000	1.308	0.25	165	7.02	12.89	4.57
WN-2D	GW-110900-WP-511	11/9/2000	1.149	0.17	135	7.62	12.42	8.3
WN-2D	GW-111000-WP-524	11/10/2000	1.297	0.33	174	7.09	12.3	5.24
WN-2D	GW-111100-WP-538	11/11/2000	1.215	0.21	141	7.03	12.79	4.91

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
WN-2D	GW-111200-WP-551	11/12/2000	1.283	0.22	158	6.96	12.52	1.86
WN-2D	GW-111300-WP-570	11/13/2000	1.254	0.28	141	6.95	11.91	2.5
WN-2D	GW-111400-WP-584	11/14/2000	1.195	0.17	150	7.08	12.08	6.55
WN-2D	GW-111500-WP-597	11/15/2000	1.055	0.13	138	6.58	10.79	4.22
WN-2D	GW-111600-WP-617	11/16/2000	1.2	0.22	150	7.10	12.6	6.6
WN-2D	GW-111700-WP-630	11/17/2000	1.089	0.16	131	7.31	11.92	4.75
WN-2D	GW-111800-WP-644	11/18/2000	1.089	0.19	136	7.34	11.90	4.78
WN-2D	GW-111900-WP-662	11/19/2000	1.292	0.19	69	6.87	11.85	1.62
WN-2D	GW-112000-WP-676	11/20/2000	1.47	0.24	-97	7.89	11.21	3.22
WN-2D	GW-112700-WP-691	11/27/2000	1.281	0.07	-193	8.66	11.16	4.62
WN-2D	GW-121800-WP-707	12/18/2000	1.227	0.13	93	8.06	10.36	5.53
WN-2E	GW-100800-WP-031	10/8/2000	18.3	0.28	121	8.77	11.22	32.7
WN-2E	GW-101100-WP-069	10/11/2000	19	0.29	105	8.81	11.41	13.5
WN-2E	GW-101300-WP-097	10/13/2000	18.8	0.56	143	8.78	12.48	12.9
WN-2E	GW-101500-WP-125	10/15/2000	18.2	0.58	117	8.84	11.7	6.28
WN-2E	GW-101800-WP-164	10/18/2000	16.1	0.14	59	8.92	11.82	14
WN-2E	GW-102000-WP-189	10/20/2000	8.9	0.15	81	9.04	12.13	13.3
WN-2E	GW-102200-WP-209	10/22/2000	3.13	0.28	118	9.18	12	18.5
WN-2E	GW-102300-WP-230	10/23/2000	2.1	0.35	130	9.05	12.33	25.4
WN-2E	GW-102400-WP-247	10/24/2000	2.96	0.2	149	9.03	12.14	25.6
WN-2E	GW-102500-WP-260	10/25/2000	2.45	0.27	121	9.08	12.25	20.3
WN-2E	GW-102600-WP-279	10/26/2000	3.44	0.11	130	8.99	12.34	20.9
WN-2E	GW-102700-WP-298	10/27/2000	0.982	0.21	196	8.01	12.88	15.3
WN-2E	GW-102800-WP-317	10/28/2000	4.22	0.25	174	8.26	12.08	14.2
WN-2E	GW-102900-WP-336	10/29/2000	3.2	0.1	83	8.94	12.39	10.1
WN-2E	GW-103000-WP-360	10/30/2000	4.65	0.17	22	8.88	12.7	3.32
WN-2E	GW-103100-WP-380	10/31/2000	6.26	0.15	90	8.73	12.89	7.99
WN-2E	GW-110100-WP-393	11/1/2000	6.37	0.07	49	8.71	13.12	8.85
WN-2E	GW-110200-WP-413	11/2/2000	4.82	0.1	37	8.76	12.86	9.59
WN-2E	GW-110300-WP-426	11/3/2000	5.02	0.27	72	8.75	12.8	11.9
WN-2E	GW-110400-WP-439	11/4/2000	6.1	0.29	100	8.76	12.75	11.7
WN-2E	GW-110500-WP-459	11/5/2000	7.18	0.1	31	8.76	12.91	7.62
WN-2E	GW-110600-WP-467	11/6/2000	9.83	0.2	105	8.79	12.62	8.74
WN-2E	GW-110700-WP-485	11/7/2000	9.74	0.12	76	8.84	12.72	11.7
WN-2E	GW-110800-WP-498	11/8/2000	8.87	0.15	101	8.82	12.83	12.6
WN-2E	GW-110900-WP-512	11/9/2000	8.96	0.1	91	8.86	12.06	10.8
WN-2E	GW-111000-WP-525	11/10/2000	11.71	0.29	114	8.91	12.13	8.21
WN-2E	GW-111100-WP-539	11/11/2000	9.86	0.14	84	8.64	12.5	5.05

TABLE 4.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
WN-2E	GW-111200-WP-552	11/12/2000	11	0.12	99	8.70	12.27	7.22
WN-2E	GW-111300-WP-571	11/13/2000	6.88	0.19	86	8.67	11.71	10.2
WN-2E	GW-111400-WP-585	11/14/2000	9.26	0.14	107	8.75	11.62	8.61
WN-2E	GW-111500-WP-598	11/15/2000	12.97	0.14	70	8.71	11.42	16.4
WN-2E	GW-111600-WP-618	11/16/2000	9.3	0.19	110	8.69	11.65	8.65
WN-2E	GW-111700-WP-631	11/17/2000	12.63	0.08	97	8.79	11.5	10.4
WN-2E	GW-111800-WP-645	11/18/2000	12.63	0.12	99	8.74	11.49	9.98
WN-2E	GW-111900-WP-663	11/19/2000	13.89	0.07	-19	8.78	11.69	8.15
WN-2E	GW-112000-WP-677	11/20/2000	1.212	0.1	-178	9.10	11.07	8.68
WN-2E	GW-112700-WP-692	11/27/2000	9.4	0.05	-239	9.58	11.05	4.67
WN-2E	GW-121800-WP-708	12/18/2000	15.6	0.1	-20	9.01	10.33	3.12
WN-3A	GW-100200-WP-006	10/2/2000	1.08	0.14	166	6.48	14.32	-
WN-3A	GW-100400-WP-012	10/4/2000	1.021	0.74	149	6.72	14.16	-
WN-3A	GW-100500-WP-019	10/5/2000	-	7.76	225	6.69	13.91	-
WN-3A	GW-100900-WP-036	10/9/2000	0.934	0.67	214	6.77	13.4	30
WN-3A	GW-101600-WP-137	10/16/2000	0.883	0.4	221	6.70	14.26	0.86
WN-3A	GW-101900-WP-175	10/19/2000	0.899	0.33	202	6.76	14.36	1.19
WN-3A	GW-102200-WP-215	10/22/2000	0.93	0.23	161	6.86	14.23	1.24
WN-3A	GW-103000-WP-361	10/30/2000	0.825	0.2	90	6.80	14.03	1.41
WN-3A	GW-110200-WP-398	11/2/2000	0.824	0.37	252	6.70	13.9	1.15
WN-3A	GW-110500-WP-444	11/5/2000	0.822	0.36	319	6.75	13.83	1.27
WN-3A	GW-111300-WP-556	11/13/2000	0.791	0.34	274	6.50	13.18	2.91
WN-3A	GW-111600-WP-603	11/16/2000	0.769	0.28	232	6.57	13.09	0.58
WN-3A	GW-112700-WP-682	11/27/2000	0.884	0.27	20	7.60	12.95	0.52
WN-3A	GW-112700-WP-688	11/27/2000	0.805	0.1	-149	7.84	12.71	0.58
WN-3A	GW-121800-WP-710	12/18/2000	0.874	0.14	119	6.85	11.56	0.46
WN-3B	GW-100200-WP-005	10/2/2000	2.61	0.21	112	8.18	12.83	-
WN-3B	GW-100400-WP-011	10/4/2000	2.41	0.94	111	7.87	12.75	-
WN-3B	GW-100500-WP-018	10/5/2000	-	9.89	145	7.77	12.6	-
WN-3B	GW-100900-WP-035	10/9/2000	1.66	0.59	210	7.30	12.1	30
WN-3B	GW-101600-WP-138	10/16/2000	1.67	0.28	192	7.34	12.9	10.8
WN-3B	GW-101900-WP-176	10/19/2000	1.58	0.31	188	7.17	13.3	6.16
WN-3B	GW-102200-WP-216	10/22/2000	1.52	0.24	163	7.08	13.29	3.68
WN-3B	GW-110200-WP-399	11/2/2000	1.373	0.33	226	6.92	13.02	0.94
WN-3B	GW-110500-WP-445	11/5/2000	1.323	0.27	295	6.92	13.04	3.46
WN-3B	GW-111300-WP-557	11/13/2000	1.261	0.32	272	6.71	12.29	3.26
WN-3B	GW-111600-WP-604	11/16/2000	1.309	0.28	207	6.80	12.29	0.85
WN-3B	GW-111900-WP-650	11/19/2000	1.33	0.26	221	6.83	12.04	1.93

TABLE 4.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
WN-3B	GW-112700-WP-683	11/27/2000	1.425	0.19	-52	7.78	12.22	0.64
WN-3B	GW-121800-WP-711	12/18/2000	1.367	0.14	76	7.07	11.58	0.58
WN-3C	GW-100200-WP-004	10/2/2000	6.35	0.08	70	8.40	12.59	-
WN-3C	GW-100400-WP-010	10/4/2000	4.87	1.18	67	8.78	12.38	4.98
WN-3C	GW-100500-WP-017	10/5/2000	4.41	0.91	100	8.79	12.05	-
WN-3C	GW-100900-WP-034	10/9/2000	3.49	0.43	183	8.86	11.52	2.25
WN-3C	GW-101600-WP-139	10/16/2000	3.59	0.27	124	8.85	12.33	3.68
WN-3C	GW-101900-WP-177	10/19/2000	3.15	0.21	108	8.93	12.78	1.43
WN-3C	GW-102200-WP-217	10/22/2000	3.07	0.27	98	8.94	12.71	1.67
WN-3C	GW-103000-WP-363	10/30/2000	3.12	0.18	30	8.80	12.6	2.34
WN-3C	GW-110200-WP-400	11/2/2000	2.7	0.23	144	8.80	12.44	1.25
WN-3C	GW-110500-WP-446	11/5/2000	2.59	0.15	210	8.80	12.49	1.5
WN-3C	GW-111300-WP-558	11/13/2000	2.43	0.25	200	8.49	11.59	2.21
WN-3C	GW-111600-WP-605	11/16/2000	2.58	0.26	98	8.68	11.69	1.43
WN-3C	GW-111900-WP-651	11/19/2000	2.5	0.22	145	8.66	11.59	1.22
WN-3C	GW-112700-WP-684	11/27/2000	3.35	0.08	-135	9.57	11.7	1.97
WN-3C	GW-121800-WP-709	12/18/2000	4.01	0.19	98	9.06	11.03	2.05
WN-3D	GW-100200-WP-003	10/2/2000	13.72	0.07	35	8.69	12.24	-
WN-3D	GW-100400-WP-009	10/4/2000	14.7	0.57	48	8.81	12.08	4.98
WN-3D	GW-100500-WP-016	10/5/2000	14.32	0.44	88	8.83	11.93	-
WN-3D	GW-100900-WP-033	10/9/2000	13.51	0.82	178	8.93	11.16	1.88
WN-3D	GW-101600-WP-140	10/16/2000	13.56	0.25	147	8.94	12.12	2.25
WN-3D	GW-101900-WP-178	10/19/2000	12.98	0.07	106	8.97	12.76	2.05
WN-3D	GW-102200-WP-218	10/22/2000	13.44	0.13	105	9.05	12.46	1.88
WN-3D	GW-103000-WP-364	10/30/2000	13.55	0.1	45	8.93	12.24	2.78
WN-3D	GW-110200-WP-401	11/2/2000	12.45	0.12	154	8.93	12.6	1.51
WN-3D	GW-110500-WP-447	11/5/2000	12.21	0.1	214	8.97	12.14	1.83
WN-3D	GW-111300-WP-559	11/13/2000	11.56	0.15	196	8.81	11.41	7.02
WN-3D	GW-111600-WP-606	11/16/2000	12.5	0.29	104	8.88	11.41	1.52
WN-3D	GW-111900-WP-652	11/19/2000	12.21	0.13	137	8.92	11.45	2.07
WN-3D	GW-112700-WP-685	11/27/2000	13.29	0.04	-135	9.74	11.46	1.63
WN-3D	GW-121800-WP-712	12/18/2000	13.29	0.07	35	9.19	10.87	2.09
WN-3E	GW-100200-WP-001	10/2/2000	18.1	0.19	71	8.61	12.47	-
WN-3E	GW-100400-WP-008	10/4/2000	18.4	2.07	92	8.68	12.08	14.2
WN-3E	GW-100500-WP-015	10/5/2000	18.3	0.34	125	8.72	11.86	-
WN-3E	GW-100900-WP-032	10/9/2000	18.2	0.84	200	8.80	10.91	2.71
WN-3E	GW-101600-WP-141	10/16/2000	18	0.34	117	8.82	11.86	3.09
WN-3E	GW-101900-WP-179	10/19/2000	18	0.08	66	8.83	12.27	6.65

TABLE 4.4

GROUNDWATER RESULTS FOR FIELD PARAMETERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Conductivity (ms/cm)* [1]	*Dissolved Oxygen (mg/L)* [2]	*ORP (millivolts)*	*pH (std. units)* [3]	*Temperature (Celsius)*	*Turbidity (NTU)* [4]
WN-3E	GW-102200-WP-219	10/22/2000	18.5	0.17	98	8.91	12.36	3.98
WN-3E	GW-103000-WP-365	10/30/2000	19.2	0.1	52	8.81	12.14	3.17
WN-3E	GW-110200-WP-402	11/2/2000	18.1	0.11	65	8.77	12.02	2.4
WN-3E	GW-110500-WP-448	11/5/2000	18	0.1	207	8.81	12.02	4.55
WN-3E	GW-111300-WP-560	11/13/2000	16.8	0.17	201	8.63	11.35	17.8
WN-3E	GW-111600-WP-607	11/16/2000	18.6	0.3	88	8.74	10.69	4.63
WN-3E	GW-111900-WP-653	11/19/2000	18.8	0.08	122	8.77	11.16	3.57
WN-3E	GW-112700-WP-686	11/27/2000	20.9	0.06	-175	9.60	11.57	2.16
WN-3E	GW-121800-WP-713	12/18/2000	20.6	0.007	-0.61	9.05	10.5	2.42

[1] ms/cm - millisiemens per centimeter
[2] milligrams per liter
[3] std. units - standard units
[4] NTU - nephelomedric turbity units

TABLE 4.5

MEASURED FLOW RATES
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	DATE	EW-1	EW-2	EW-3	EW-4	RW-1	RW-2	RW-3	RW-4	RW-5	RW-6
					PHASE I OF PILOT TEST- CONTAMINANT MASS TEST						
Started E-Unit @ 13:23	10/02/00	OFF	OFF	OFF	NM	OFF	OFF	OFF	OFF	OFF	OFF
	10/03/00	OFF	OFF	OFF	2,995.0	OFF	OFF	OFF	OFF	OFF	OFF
	10/04/00	OFF	OFF	OFF	2,730.0	OFF	OFF	OFF	OFF	OFF	OFF
	10/05/00	OFF	OFF	OFF	3,029.0	OFF	OFF	OFF	OFF	OFF	OFF
	10/06/00	OFF	OFF	OFF	2,798.0	OFF	OFF	OFF	OFF	OFF	OFF
	10/07/00	OFF	OFF	OFF	2,790.0	OFF	OFF	OFF	OFF	OFF	OFF
	10/08/00	OFF	OFF	OFF	2,720.0	OFF	OFF	OFF	OFF	OFF	OFF
					2,843.7	*EW-4 Average Pumping Rate (ml/min) for Stage I*					
Shutdown E- Unit @ 08:35	10/09/00										
Started ER-Unit @ 08:55	10/09/00	1,000.0	909.0	968.0	OFF	508.0	508.0	455.0	N/A	N/A	536.0
	10/10/00	1,034.0	1,071.0	937.5	OFF	492.0	500.0	484.0	577.0	484.0	577.0
	10/11/00	1,034.0	909.0	909.0	OFF	500.0	500.0	666.0	600.0	666.0	576.0
	10/12/00	1,077.0	1,034.0	968.0	OFF	566.0	588.0	577.0	612.0	566.0	577.0
	10/13/00	968.0	937.5	909.0	OFF	588.0	588.0	600.0	625.0	577.0	600.0
	10/14/00	938.0	968.0	938.0	OFF	577.0	536.0	526.0	577.0	500.0	600.0
	10/15/00	938.0	833.0	857.0	OFF	556.0	545.0	545.0	556.0	517.0	600.0
Started Eunit @ 10:26	10/16/00	1,034.5	1,064.0	1,053.0	2,129.0	508.0	536.0	484.0	574.0	469.0	566.0
	10/17/00	1,053.0	1,119.0	1,038.0	2,041.0	568.0	596.0	618.0	611.0	639.6	601.2
	10/18/00	938.0	909.0	882.0	NM	556.0	588.0	508.0	600.0	485.0	577.0
	10/19/00	990.0	1,010.0	990.0	2,014.0	629.0	658.0	617.0	605.0	617.0	606.0
	10/20/00	1,042.0	1,083.0	1,056.0	2,154.0	603.0	622.0	547.0	542.0	557.0	540.5
	10/21/00	1,020.0	1,172.0	1,075.0	2,143.0	602.0	614.0	540.5	540.5	540.5	540.5
	10/22/00	1,024.0	1,234.0	1,111.0	2,155.0	564.0	605.0	539.0	535.0	540.0	535.0
Average Pumping Rate (ml/min)		*1,006.5*	*1,018.0*	*978.0*		*558.4*	*570.3*	*550.5*	*581.1*	*550.6*	*573.7*
					2,106.0	*EW-4 Average Pumping Rate (ml/min) for Stage II*					
Shutdown E & ER- Units @ 08:00	10/23/00										

TABLE 4.5

MEASURED FLOW RATES
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

	DATE	EW-1	EW-2	EW-3	EW-4	RW-1	RW-2	RW-3	RW-4	RW-5	RW-6
					PHASE II OF PILOT TEST- TRACER TEST						
Started ER-Unit @ 11:00	10/24/00	1,003.0	965.0	1,042.0	OFF	176.0	200.0	166.7	909.0	882.0	1,034.0
	10/25/00	937.0	983.6	1,041.6	OFF	197.3	194.8	194.8	909.0	967.0	937.5
	10/26/00	997.1	1,030.9	1,045.3	OFF	197.1	201.7	196.8	964.6	914.6	999.9
	10/27/00	968.0	1,000.0	1,071.0	OFF	194.0	200.0	196.0	938.0	938.0	988.0
	10/28/00	911.6	1,010.1	1,045.3	OFF	200.0	199.0	199.0	877.0	809.0	914.0
	10/29/00	1,111.0	1,153.0	1,071.0	OFF	214.0	214.0	213.0	1,071.0	1,071.0	1,111.0
Started E-Unit @ 08:40	10/30/00	1,007.0	1,060.0	1,020.0	1,256.0	211.0	219.0	202.0	987.0	965.0	1,003.0
	10/31/00	1,068.0	1,075.0	1,087.0	1,411.0	182.9	211.0	191.0	971.0	967.0	1,007.0
	11/01/00	1,111.0	1,071.0	1,111.0	NM	185.0	203.0	192.0	968.0	1,000.0	968.0
	11/02/00	1,136.4	1,045.3	1,167.3	1,401.0	NM	NM	NM	NM	NM	NM
	11/03/00	833.0	909.0	938.0	NM	214.0	220.0	210.0	882.3	882.3	946.3
	11/04/00	833.0	732.0	882.0	NM	213.0	219.0	211.0	882.0	857.0	938.0
	11/05/00	1,027.4	1,045.3	1,094.9	1,605.9	211.3	222.2	202.7	968.0	943.4	1,023.9
					1,418.5	*EW-4 Average Pumping Rate (ml/min) for Stage III*					
Shutdown E- Unit @ 08:20	11/06/00	970.8	983.6	1,003.3	OFF	NM	NM	NM	NM	NM	NM
	11/07/00	1,006.3	999.0	1,031.2	OFF	206.9	204.0	191.0	961.2	952.0	970.0
	11/08/00	999.9	952.3	1,030.9	OFF	206.6	210.2	201.3	914.6	986.8	955.4
	11/09/00	1,038.0	1,030.9	1,063.8	OFF	205.9	208.9	201.8	906.3	940.4	911.8
	11/10/00	1,190.4	1,098.9	1,200.0	OFF	214.2	218.4	206.1	887.5	946.3	934.5
	11/11/00	1,153.0	1,111.0	1,153.0	OFF	217.0	220.0	220.0	938.0	909.0	909.0
	11/12/00	1,010.0	949.0	1,060.0	OFF	214.0	219.0	203.0	955.0	896.0	993.0
Started E-Unit @ 08:40	11/13/00	920.2	909.0	1,045.2	770.0	196.0	204.0	187.5	810.8	793.6	852.2
	11/14/00	895.5	940.4	1,016.9	787.4	208.3	215.8	201.3	952.3	993.3	996.6
	11/15/00	1,428.5	1,293.1	1,369.8	744.5	224.8	230.0	215.2	884.9	996.6	925.9
	11/16/00	1,071.0	1,111.0	1,071.0	NM	208.0	216.0	204.0	909.0	909.0	938.0
	11/17/00	1,071.0	1,071.0	1,071.0	765.0	210.0	211.0	205.0	938.0	938.0	938.0
	11/18/00	1,071.0	1,071.0	1,071.0	760.0	207.0	207.0	205.0	938.0	909.0	938.0
	11/19/00	1,056.0	1,058.0	1,024.0	677.0	227.0	231.0	217.0	958.5	993.4	986.8
Average Pumping Rate (ml/min)		*1,030.6*	*1,024.4*	*1,067.7*		*205.7*	*212.0*	*201.3*	*931.2*	*934.4*	*964.8*
Shutdown E- Unit @ 10:15	11/20/00				*750.7*	*EW-4 Average Pumping Rate (ml/min) for Stage IV*					
Shutdown ER-Unit @ 11:55											

TABLE 4.6

TAP WATER MONITORING RESULTS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Date	*pH (standard units)*	*Conductivity (ms/cm)* [1]	*Temperature (centigrade)*	*Dissolved Oxygen (mg/L)* [2]	*ORP (mv)* [3]	*Residual Chlorine (mg/L)* [2]
October 2000						
10/10/00	7.38	0.262	13.80	8.66	391	0.8
10/12/00	7.41	0.259	15.97	8.44	437	0.8
10/14/00	7.30	0.256	15.63	8.52	425	0.8
10/15/00	7.74	0.261	15.33	8.92	286	0.8
10/17/00	7.43	0.260	15.12	8.83	304	0.6
10/18/00	7.54	0.261	17.10	8.02	283	0.8
10/21/00	7.47	0.257	15.07	8.43	298	0.6
10/24/00	7.56	0.263	16.25	6.53	414	0.6
10/29/00	7.83	0.261	14.40	7.30	176	0.8
10/31/00	7.52	0.265	15.50	7.52	383	0.6
November 2000						
11/2/00	7.49	0.249	15.83	8.22	214	0.6
11/4/00	7.50	0.251	14.25	8.43	119	0.8
11/7/00	7.28	0.257	12.52	10.43	321	0.6
11/9/00	7.76	0.255	10.78	9.41	166	0.6
11/11/00	7.58	0.265	10.47	9.02	42.0	0.6
11/14/00	7.66	0.261	10.41	9.23	95.0	0.6
11/16/00	8.33	0.269	8.33	13.14	33.0	0.6
11/18/00	7.52	0.302	8.26	14.10	35.0	0.6

[1] ms/cm - millisiemens per centimeter
[2] mg/L - milligrams per liter
[3] mv - millivolts

TABLE 5.1

SUMMARY OF AVERAGE GROUNDWATER ELEVATIONS AND HYDRAULIC GRADIENTS - E/R UNIT WAUKEGAN MANUFACTURED GAS AND COKE PLAN WAUKEGAN, ILLINOIS

Phase I		*Phase II*	
Well Location	*Average Groundwater Elevation (feet AMSL)*	*Well Location*	*Average Groundwater Elevation (feet AMSL)*
EW-1	580.57	EW-1	580.27
EW-2	580.82	EW-2	580.49
EW-3	580.26	EW-3	579.27
RW-1	581.76	RW-1	581.27
RW-2	581.75	RW-2	581.26
RW-3	581.78	RW-3	581.29
RW-4	581.86	RW-4	582.07
RW-5	581.97	RW-5	582.33
RW-6	581.73	RW-6	581.79
WN-1A	581.46	WN-1A	581.16
WN-1B	581.45	WN-1B	581.15
WN-1C	581.39	WN-1C	581.08
WN-1D	581.36	WN-1D	581.02
WN-1E	581.33	WN-1E	580.98
WN-2A	581.46	WN-2A	581.21
WN-2B	581.43	WN-2B	581.18
WN-2C	581.32	WN-2C	581.06
WN-2D	581.12	WN-2D	580.84
WN-2E	581.07	WN-2E	580.81

Average Horizontal Gradient (feet/foot)

	Phase I	*Phase II*
RW-2 - EW-1	0.1152	0.0971
RW-5 - EW-1	0.1368	0.2020
RW-3 - EW-2	0.0949	0.0784
RW-6 - EW-2	0.0893	0.1275
RW-1 - EW-3	0.1463	0.1961
RW-4 - EW-3	0.1569	0.2745

TABLE 5.2

SUMMARY OF AVERAGE GROUNDWATER ELEVATIONS AND HYDRAULIC GRADIENTS - E UNIT
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well Location	*Average Groundwater Elevation (feet AMSL) (2.81/min)*	*Average Groundwater Elevation (feet AMSL) (2.11/min)*	*Average Groundwater Elevation (feet AMSL) (1.41/min)*	*Average Groundwater Elevation (feet AMSL) (0.75/min)*
EW-4	580.11	580.04	580.05	580.97
WN-3A	581.73	581.28	581	581.37
WN-3B	581.65	581.24	580.97	581.36
WN-3C	581.57	581.18	580.91	581.34
WN-3D	581.49	581.11	580.86	581.31
WN-3E	581.51	581.13	580.89	581.33
Average Horizontal Hydraulic Gradient (feet/foot)				
WN-3A - EW-4	0.324	0.248	0.19	0.08
WN-3B - EW-4	0.308	0.24	0.184	0.078
WN-3C - EW-4	0.292	0.228	0.172	0.074
WN-3D - EW-4	0.276	0.214	0.162	0.068
WN-3E - EW-4	0.28	0.218	0.168	0.072

TABLE 6.1

ANALYSIS OF GROUNDWATER FROM WAUKEGAN
TREATED WITH FENTON REAGENT AT pH 3.8

Parameter (mg/L)	*RAW*	*H_2O_2 = 150 mg/L*			*H_2O_2 = 300 mg/L*		
		Fe = 60 mg/L	*Fe = 120 mg/L*	*Fe = 180 mg/L*	*Fe = 60 mg/L*	*Fe = 120 mg/L*	*Fe = 180 mg/L*
pH (Std. Units)	9.06	-	-	-	-	-	-
TSS	4	150	235	279	190	275	309
BOD	1770	-	-	-	-	-	-
TOC	850	-	-	-	-	-	-
COD	3240	-	-	-	-	-	-
Dissolved COD	-	2600	2990	3030	2780	2720	2800
Dissolved Thiocyanate	408	379	370	369	322	335	336
DOC	-	777	715	773	685	719	720
NH3-N	1890	-	-	-	-	-	-
Dissolved NH3-N	-	1780	1760	1810	1790	1780	1790
TKN	1890	-	-	-	-	-	-
Total Phosphorus	<0.10	-	-	-	-	-	-
Alkalinity	1490	-	-	-	-	-	-
Phenols	617	-	-	-	-	-	-
Dissolved Phenols	-	580	520	578	480	471	522
Dissolved Aluminum	<0.40	<0.40	0.53	0.45	0.69	0.81	0.53
Dissolved Antimony	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	9.02	-	-	-	-	-	-
Dissolved Arsenic	7.64	2.40	1.42	1.14	2.78	1.91	0.80
Dissolved Barium	0.043	0.056	0.359	0.404	0.370	0.347	0.396
Dissolved Beryllium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Boron	0.34	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Cadmium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Calcium	9.03	11.8	11.3	11.6	11.1	11.3	12.1
Dissolved Chromium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Copper	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042
Dissolved Cobalt	<0.040	<0.040	<0.040	0.095	<0.040	<0.040	0.063
Iron	2.31	-	-	-	-	-	-
Dissolved Iron	2.09	494	684	962	354	668	1000
Dissolved Lead	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Magnesium	10.1	-	-	-	-	-	-
Dissolved Magnesium	7.8	9.22	9.60	9.52	9.08	9.33	10.5
Dissolved Manganese	0.099	0.609	0.830	1.16	0.441	0.818	1.23
Dissolved Molybdenum	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Dissolved Nickel	<0.12	<0.12	<0.12	0.281	0.278	0.191	0.298
Dissolved Potassium	4.4	4.6	5.8	6.2	6.0	6.5	6.4
Dissolved Selenium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Silver	<0.08	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Dissolved Sodium	45.2	378	295	259	904	713	52.3
Dissolved Strontium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Vanadium	0.946	0.435	0.378	0.167	0.369	0.434	2.29
Dissolved Zinc	0.670	0.281	0.615	0.689	0.575	0.651	0.717

TABLE 6.2

ANALYSIS OF GROUNDWATER FROM WAUKEGAN
TREATED WITH FENTON REAGENT AT pH 5.5

Parameter (mg/L)	*RAW*	*H_2O_2 = 150 mg/L*			*H_2O_2 = 300 mg/L*		
		Fe = 60 mg/L	*Fe = 120 mg/L*	*Fe = 180 mg/L*	*Fe = 60 mg/L*	*Fe = 120 mg/L*	*Fe = 180 mg/L*
pH (Std. Units)	9.06	-	-	-	-	-	-
TSS	4	600	522	600	430	594	626
BOD	1770	-	-	-	-	-	-
TOC	850	-	-	-	-	-	-
COD	3240	-	-	-	-	-	-
Dissolved COD	-	2870	2760	2910	2500	2600	2850
Dissolved Thiocyanate	408	386	370	382	332	347	352
DOC	-	760	653	744	721	700	673
NH3-N	1890	-	-	-	-	-	-
Dissolved NH3-N	-	1720	1730	1710	1690	1710	1700
TKN	1890	-	-	-	-	-	-
Total Phosphorus	<0.10	-	-	-	-	-	-
Alkalinity	1490	-	-	-	-	-	-
Phenols	617	-	-	-	-	-	-
Dissolved Phenols	-	560	592	572	270	402	352
Dissolved Aluminum	<0.40	0.44	0.65	<0.40	0.61	1.24	<0.40
Dissolved Antimony	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	9.02	-	-	-	-	-	-
Dissolved Arsenic	7.64	<0.40	<0.40	<0.40	<0.40	0.45	<0.40
Dissolved Barium	0.043	0.604	0.523	0.466	0.155	0.133	0.379
Dissolved Beryllium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Boron	0.34	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Cadmium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Calcium	9.03	12.5	11.9	12.7	14.3	15.3	11.2
Dissolved Chromium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Copper	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042
Dissolved Cobalt	<0.040	<0.040	<0.040	0.075	<0.040	<0.040	0.060
Iron	2.31	-	-	-	-	-	-
Dissolved Iron	2.09	280	604	991	268	552	912
Dissolved Lead	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Magnesium	10.1	-	-	-	-	-	-
Dissolved Magnesium	7.8	9.62	10.1	11.2	9.60	10.7	10.2
Dissolved Manganese	0.099	0.615	0.924	1.40	0.442	0.900	1.26
Dissolved Molybdenum	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Dissolved Nickel	<0.12	0.150	0.187	0.268	<0.12	<0.12	0.341
Dissolved Potassium	4.4	6.5	6.7	6.6	4.5	5	6.3
Dissolved Selenium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Silver	<0.08	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Dissolved Sodium	45.2	51.0	128	49.6	78.8	42.3	123
Dissolved Strontium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Vanadium	0.946	0.185	<0.080	0.244	0.268	1.65	0.788
Dissolved Zinc	0.670	0.681	0.791	0.892	0.221	0.315	0.758

TABLE 6.3

ANALYSIS OF GROUNDWATER FROM WAUKEGAN
TREATED WITH FENTON REAGENT AT pH 7.5

Parameter (mg/L)	*RAW*	*H_2O_2 = 150 mg/L*			*H_2O_2 = 300 mg/L*		
		Fe = 60 mg/L	*Fe = 120 mg/L*	*Fe = 180 mg/L*	*Fe = 60 mg/L*	*Fe = 120 mg/L*	*Fe = 180 mg/L*
pH (Std. Units)	9.06	-	-	-	-	-	-
TSS	4	130	270	288	190	265	320
BOD	1770	-	-	-	-	-	-
TOC	850	-	-	-	-	-	-
COD	3240	-	-	-	-	-	-
Dissolved COD	-	2690	3020	3030	2840	2790	2800
Dissolved Thiocyanate	408	354	330	359	316	328	330
DOC	-	780	732	757	680	710	720
NH3-N	1890	-	-	-	-	-	-
Dissolved NH3-N	-	1780	1760	1810	1790	1780	1790
TKN	1890	-	-	-	-	-	-
Total Phosphorus	<0.10	-	-	-	-	-	-
Alkalinity	1490	-	-	-	-	-	-
Phenols	617	-	-	-	-	-	-
Dissolved Phenols	-	610	540	578	480	461	422
Dissolved Aluminum	<0.40	<0.40	0.53	0.45	0.69	0.81	0.53
Dissolved Antimony	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	9.02	-	-	-	-	-	-
Dissolved Arsenic	7.64	2.80	2.23	2.18	2.78	1.91	1.22
Dissolved Barium	0.043	0.056	0.359	0.404	0.370	0.347	0.396
Dissolved Beryllium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Boron	0.34	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Cadmium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Calcium	9.03	11.8	11.3	11.6	11.1	11.3	12.1
Dissolved Chromium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Copper	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042
Dissolved Cobalt	<0.040	<0.040	<0.040	0.095	<0.040	<0.040	0.063
Iron	2.31	-	-	-	-	-	-
Dissolved Iron	2.09	494	684	962	354	668	1000
Dissolved Lead	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Magnesium	10.1	-	-	-	-	-	-
Dissolved Magnesium	7.8	9.22	9.60	9.52	9.08	9.33	10.5
Dissolved Manganese	0.099	0.609	0.830	1.16	0.441	0.818	1.23
Dissolved Molybdenum	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Dissolved Nickel	<0.12	<0.12	<0.12	0.281	0.278	0.191	0.298
Dissolved Potassium	4.4	4.6	5.8	6.2	6.0	6.5	6.4
Dissolved Selenium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Silver	<0.08	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Dissolved Sodium	45.2	378	295	259	904	713	52.3
Dissolved Strontium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Vanadium	0.946	0.455	0.378	0.17	0.369	0.434	2.29
Dissolved Zinc	0.667	0.281	0.615	0.689	0.575	0.651	0.717

TABLE 6.4

ANALYSIS OF GROUNDWATER FROM WAUKEGAN
TREATED WITH HUMATES

Parameter (*mg/L*)	*RAW*	*Humates dose (mg/L)*										
		100	*200*	*400*	*1000*	*2000*	*3000*	*4000*	*5000*	*6000*	*8000*	*10000*
pH (Std. Units)	9.06	-	-	-	-	-	-	-	-	-	-	-
TSS	4	-	-	-	-	-	-	-	-	-	-	-
BOD	1770	-	-	-	-	-	-	-	-	-	-	-
TOC	850	-	-	-	-	-	-	-	-	-	-	-
COD	3240	-	-	-	-	-	-	-	-	-	-	-
Dissolved COD	-	3130	3250	3250	3110	3110	3090	3130	3230	3070	3210	3190
Dissolved Thiocyanate	408	399	390	394	398	411	394	435	412	412	411	417
NH3-N	1890	-	-	-	-	-	-	-	-	-	-	-
Dissolved NH3-N	-	1800	1770	1760	1850	1820	1710	1750	1810	1780	1720	1740
TKN	1890	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	<0.10	-	-	-	-	-	-	-	-	-	-	-
Alkalinity	1490	-	-	-	-	-	-	-	-	-	-	-
Phenols	617	-	-	-	-	-	-	-	-	-	-	-
Dissolved Phenols	-	699	1610	848	733	1140	971	2800	1910	1090	2380	1760
Dissolved Aluminum	<0.40	1.04	0.66	0.43	0.40	0.83	8.26	0.80	0.77	0.91	0.55	1.24
Dissolved Antimony	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	9.02	-	-	-	-	-	-	-	-	-	-	-
Dissolved Arsenic	7.64	8.33	8.23	8.42	8.14	7.79	7.37	8.07	7.40	6.98	7.34	6.72
Dissolved Barium	0.043	0.068	0.060	0.050	0.045	0.053	0.066	0.763	0.052	0.696	0.0478	0.925
Dissolved Beryllium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Boron	0.34	0.53	0.82	0.49	0.51	0.42	0.50	0.61	0.48	0.55	0.58	0.58
Dissolved Cadmium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Calcium	9.03	13.5	13.6	17.0	19.0	38.1	49.4	53.2	57.2	60.0	71.5	59.4
Dissolved Chromium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Copper	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	0.329	<0.042	<0.042	<0.042	0.0693	<0.042
Dissolved Cobalt	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Iron	2.31	-	-	-	-	-	-	-	-	-	-	-
Dissolved Iron	2.09	2.33	2.46	2.27	1.78	3.46	6.92	3.22	2.87	3.50	1.49	5.93
Dissolved Lead	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Magnesium	10.1	-	-	-	-	-	-	-	-	-	-	-
Dissolved Magnesium	7.8	9.43	9.68	9.02	9.97	10.2	11.5	12.2	12.6	13.1	15.6	16.2
Dissolved Manganese	0.099	0.045	0.046	0.029	0.034	<0.020	0.071	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Molybdenum	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Dissolved Nickel	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	0.345	<0.12	<0.12	0.206	0.192	<0.12
Dissolved Potassium	4.4	4.8	5.6	4.9	4.6	4.7	5.4	6.2	5.4	6.0	5.6	6.6
Dissolved Selenium	<0.20	<0.20	<0.20	<0.20	0.394	0.278	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Silver	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Dissolved Sodium	45.2	48.0	51.1	52.2	47.4	53.3	58.5	69.3	63.5	72.1	80.4	86.0
Dissolved Strontium	<0.20	<0.20	<0.20	0.23	<0.20	0.45	0.70	0.55	0.46	0.75	0.82	0.81
Dissolved Vanadium	0.946	0.317	1.03	0.568	0.360	0.514	0.639	0.469	0.219	0.559	0.452	0.204
Dissolved Zinc	0.067	<0.10	<0.10	<0.10	<0.10	<0.10	0.429	0.102	<0.10	0.113	0.120	0.136

TABLE 6.5

ANALYSIS OF GROUNDWATER FROM WAUKEGAN TREATED WITH HUMATES AND HYDROGEN PEROXIDE AT pH 7.5

Parameter (mg/L)	*RAW*	*pH = 7.5*			*H_2O_2 = 300 mg/L*		
		Humates dose (mg/L)					
		200	*500*	*1000*	*1500*	*2000*	*4000*
pH (Std. Units)	9.06	-	-	-	-	-	-
TSS	4	44	146	366	469	370	1320
BOD	1770	-	-	-	-	-	-
TOC	850	-	-	-	-	-	-
COD	3240	-	-	-	-	-	-
Dissolved COD	-	2950	2930	3010	3010	2890	2970
Dissolved Thiocyanate	408	358	369	355	278	356	389
NH3-N	1890	-	-	-	-	-	-
Dissolved NH3-N	-	1770	1750	1760	1730	1680	1670
TKN	1890	-	-	-	-	-	-
Total Phosphorus	<0.10	-	-	-	-	-	-
Alkalinity	1490	-	-	-	-	-	-
DOC	-	770	838	806	810	792	852
Phenols	617	-	-	-	-	-	-
Dissolved Phenols	-	565	565	576	569	689	469
Dissolved Aluminum	<0.40	<0.40	0.50	1.72	0.65	0.42	0.92
Dissolved Antimony	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	9.02	-	-	-	-	-	-
Dissolved Arsenic	7.64	8.04	8.17	7.48	7.34	7.70	7.40
Dissolved Barium	0.043	0.724	0.713	0.028	0.666	0.734	0.664
Dissolved Beryllium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Boron	0.34	0.64	0.59	0.29	0.44	0.47	0.38
Dissolved Cadmium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Calcium	9.03	20.5	23.7	35.4	46.5	38.1	61.9
Dissolved Chromium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Copper	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042
Dissolved Cobalt	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Iron	2.31	-	-	-	-	-	-
Dissolved Iron	2.09	2.04	2.74	2.76	4.42	2.01	3.85
Dissolved Lead	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Magnesium	10.1	-	-	-	-	-	-
Dissolved Magnesium	7.8	10.2	9.35	9.82	11.6	11.7	13.7
Dissolved Manganese	0.099	0.043	0.066	0.028	0.027	0.028	<0.020*
Dissolved Molybdenum	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Dissolved Nickel	<0.12	0.138	0.162	0.419	<0.12	<0.12	0.174
Dissolved Potassium	4.4	6.5	6.2	4.8	5.7	6.5	6.1
Dissolved Selenium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Silver	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Dissolved Sodium	45.2	57.1	54.5	47.7	59.7	61.0	66.0
Dissolved Strontium	<0.20	<0.20	<0.20	<0.20	0.434	0.284	0.644
Dissolved Vanadium	0.946	0.613	0.673	0.633	0.478	0.465	0.312
Dissolved Zinc	0.067	0.341	0.344	0.090	0.239	0.386	0.302

TABLE 6.6

ANALYSIS OF GROUNDWATER FROM WAUKEGAN
COMPARISON OF TREATMENT WITH HUMATES AND HYDROGEN PEROXIDE
WITH AND WITHOUT IRON

Parameter (mg/L)	*RAW*	*pH=7.5 H_2O_2=300 mg/L*					
		500 mg/L Humates		*1000 mg/L Humates*		*2000 mg/L Humates*	
		0 mg/L Fe	*60 mg/L Fe*	*0 mg/L Fe*	*60 mg/L Fe*	*0 mg/L Fe*	*60 mg/L Fe*
pH (Std. Units)	9.06	-	-	-	-	-	-
TSS	4	-	-	-	-	-	-
BOD	1770	-	-	-	-	-	-
TOC	850	-	-	-	-	-	-
COD	3240	-	-	-	-	-	-
Dissolved COD	-	2970	2850	2990	3050	2970	2890
Dissolved Thiocyanate	408	334	370	354	401	352	385
NH3-N	1890	-	-	-	-	-	-
Dissolved NH3-N	-	1760	1720	1770	1740	1770	1690
TKN	1890	-	-	-	-	-	-
Total Phosphorus	<0.10	-	-	-	-	-	-
Alkalinity	1490	-	-	-	-	-	-
DOC	-	814	820	865	769	838	852
Phenols	617	-	-	-	-	-	-
Dissolved Phenols	-	1290	590	618	534	756	510
Dissolved Aluminum	<0.40	1.60	0.46	3.35	0.63	1.32	0.87
Dissolved Antimony	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	9.02	-	-	-	-	-	-
Dissolved Arsenic	7.64	7.69	<0.40	7.65	<0.40	7.07	<0.40
Dissolved Barium	0.043	0.642	0.663	0.796	0.725	0.755	0.709
Dissolved Beryllium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Boron	0.34	0.39	0.36	0.34	0.40	0.39	0.39
Dissolved Cadmium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Calcium	9.03	28.6	22.8	38.2	28.3	52.3	53.2
Dissolved Chromium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Copper	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042
Dissolved Cobalt	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Iron	2.31	-	-	-	-	-	-
Dissolved Iron	2.09	8.83	3.36	10.1	8.27	6.37	8.64
Dissolved Lead	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Magnesium	10.1	-	-	-	-	-	-
Dissolved Magnesium	7.8	9.44	9.53	10.8	9.38	11.5	12.1
Dissolved Manganese	0.099	0.033	0.055	0.060	0.041	<0.020	0.049
Dissolved Molybdenum	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Dissolved Nickel	<0.12	0.189	<0.12	<0.12	<0.12	0.205	<0.12
Dissolved Potassium	4.4	6.1	6.4	5.8	6.4	6.2	6.4
Dissolved Selenium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Silver	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Dissolved Sodium	45.2	56.2	55.7	53.7	59.8	61.2	64.4
Dissolved Strontium	<0.20	0.24	<0.20	0.31	0.307	0.48	0.602
Dissolved Vanadium	0.946	1.18	0.137	0.743	0.187	0.100	0.087
Dissolved Zinc	0.067	0.180	0.169	0.102	0.136	0.145	0.184

TABLE 6.7

ANALYSES OF RAW AND PRETREATED GROUNDWATER
FROM WAUKEGAN SITE

Parameter	*Date/Sampled*											
(mg/L)	*Nov. 3, 2000*		*Nov. 27, 2000*		*Dec. 18, 2000*		*Dec. 18, 2000*		*Dec. 29, 2000*		*Jan. 12, 2001*	
	Raw	*Treated*	*Raw*	*Treated*	*Raw*	*Treated*	*Raw*	*Treated*	*Raw*	*Treated*	*Raw*	*Treated*
pH	9.6	7.36	8.87	7.68	9.2	7.43	9.2	7.43	9.2	7.43	9.2	7.43
TSS	4	3	2	3	4	4	4	4	8	3	4	6
VSS	3	3	2	3	4	4	4	4	8	3	4	6
COD	3240	2890	3270	2700	3210	2680	3210	2680	3250	2700	3210	2680
TOC	850	769	855	773	843	728	843	728	850	730	843	728
Phenols	617	534	465	360	502	348	502	348	510	452	502	348
Arsenic	7.7	<0.4	8.36	1.7	8.12	0.92	8.12	0.92	8.12	1.96	8.12	0.92
Thiocyanate	401	385	422	392	412	364	412	364	412	403	412	364
NO3-N	1890	1890	1800	1660	1800	1760	1800	1760	1880	1800	1800	1760
GC/MS Acid/Base Neutral (*) (µg/L)												
2,4-Dimethylphenol	7300	6000	7300	5900	7100	5700	7260	5800	NA	NA	7100	5700
phenol	41000	24000	43000	26000	40000	22000	40000	21000	NA	NA	40000	22000
GC/MS VOC (*) (µg/L)												
Benzene	1130	40	1110	36	1100	38	1200	41	NA	NA	1100	36
Dichloromethane	3	1.9	3.2	1.9	3.1	1.8	3.1	2.1	NA	NA	3.4	1.75
Toluene	24	7.3	23	6.2	26	6.6	26	6.2	NA	NA	29	6.2
o-Xylene	1.9	0.6	1.8	0.6	2.1	0.8	2.1	0.8	NA	NA	2.3	0.8
p+m-Xylene	3.2	1.1	3.2	0.9	3.2	0.8	3.2	0.8	NA	NA	3.2	0.9

Note:

(*) Only detected compounds reported.

TABLE 6.8

ANALYSES OF SUPERNATANT DURING ACCLIMATIZATION
WAUKEGAN GROUNDWATER TREATABILITY

Parameter	*Sample date*					
(mg/L)	*15-Nov*	*17-Nov*	*20-Nov*	*22-Nov*	*24-Nov*	*27-Nov*
pH (St Units)	7.36	6.89	6.96	7.08	6.98	7.12
TSS	13500	12900	12300	11800	11600	11400
VSS	10100	10500	9800	9800	9400	9000
SCOD	140	230	260	320	410	618
Phenols	<0.2	<0.2	0.14	<0.02	0.016	0.012
NH3-N	11.8	28	56	122	180	295
NO3-N	38	164	186	188	202	216

TABLE 6.9

ANALYSES OF EFFLUENT DURING INITIAL BIOLOGICAL TEST (1 SBR)
WAUKEGAN GROUNDWATER TREATABILITY

Sample/Date	*Parameter (mg/L)*																	
	pH(St Unit)	*TSS*	*VSS*	*COD*	*TOC*	*DOC*	*Phenols*	*Arsenic*	*Thiocyanate*	*NH3-N*	*NO3-N*	*GC/MS Acid/Base Neutral (µg/L)*		*GC/MS VOC (µg/L)*				
												2,4-dimethylphenol	*phenol*	*benzene*	*DCA*	*toluene*	*o-xylene*	*p&m-xylene*
Raw/pretreated	7.68	3	3	2700	753	744	360	1.7	392	1660	0.5	5900	26000	36	1.9	6.2	0.6	0.9
7-Dec	7.06	4600	3700	5100	940	756	5.09	1.7	< 20	538	196	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0
10-Dec	7.02	3600	2400	3300	960	640	1.06	1.3	<20	512	202	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0
13-Dec	6.98	2300	1200	1920	260	133	0.9	1.2	<20	523	212	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0
15-Dec	6.77	2375	1175	161	64	58	0.73	1.14	<20	736	153	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0
17-Dec	6.91	800	533	175	75	75	0.02	0.85	<20	787	173	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0
19-Dec	6.88	300	267	200	66	45	<0.02	0.38	<20	1100	149	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0
21-Dec	6.85	40	40	300	52	42	<0.2	0.14	<20	1020	134	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0
Raw/pretreated	7.43	4	4	2800	728	348	358	0.96	370	1800	0.5	5800	24000	36	1.8	6.4	0.9	0.9
23-Dec	6.94	106	61	125	87	56	<0.02	0.08	<20	920	143	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0
29-Dec	6.97	1000	900	2580	152	124	<0.02	0.78	<20	1470	149	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0
3-Jan	6.93	1200	800	880	236	146	<0.02	<0.08	<20	1280	158	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0
5-Jan	6.98	26	22	970	67	57	<0.02	<0.08	<20	1180	122	<10	<20	<0.5	<0.5	<0.5	<0.5	<1.0

TABLE 6.10

ANALYSES OF EFFLUENT DURING BIOLOGICAL TEST (2 SBR)
WAUKEGAN GROUNDWATER TREATABILITY

Sample/Date	Parameter (mg/L)											GC/MS Acid/Base Neutral (µg/L)		GC/MS VOC (µg/L)				
	pH(St Unit)	TSS	VSS	COD	TOC	DOC	Phenols	Arsenic	Thiocyanate	NH3-N	NO3-N	2,4-dimethylphenol	phenol	benzene	DCA	toluene	o-xylene	p&m-xylene
Raw/pretreated	7.43	26	22	2800	728	648	358	0.96	370	1880	0.5	5980	24000	36	1.8	6.5	0.9	1.2
5-Jan																		
Reactor # 1	6.98	26	22	970	67	57	<0.02	<0.08	<20	1600	122	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
Reactor # 2	6.09	1100	700	2790	1070	96	<0.02	<0.08	<20	236	53	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
8-Jan																		
Reactor # 1	6.76	66	52	980	128	96	<0.02	0.76	<20	1180	112	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
Reactor # 2	6.91	1190	800	809	215	85	<0.02	0.21	<20	656	182	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
10-Jan																		
Reactor # 1	6.88	1200	670	1600	170	92	<0.02	0.76	<20	1210	96	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
Reactor # 2	6.9	330	210	820	206	93	<0.02	0.62	<20	686	188	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
13-Jan																		
Reactor # 1	5.97	110	76	970	126	102	0.046	<0.08	<20	1130	98	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
Reactor # 2	6.78	15	8	970	67	57	0.037	<0.08	<20	720	123	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
15-Jan																		
Reactor # 1	6.82	102	86	990	138	109	0.04	<0.08	<20	1230	102	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
Reactor # 2	6.97	15	12	970	68	57	0.037	<0.08	<20	680	125	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
18-Jan																		
Reactor # 2	6.93	16	16	880	68	64	0.028	<0.08	<20	631	124	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
20-Jan																		
Reactor # 2	6.9	18	12	970	91	83	0.045	0.03	<20	831	124	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
23-Jan																		
Reactor # 2	6.95	16	12	1030	96	88	0.055	0.03	<20	760	122	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
25-Jan																		
Reactor # 2	6.79	32	21	865	75	65	0.05	<0.08	<20	790	94	NA	NA	NA	NA	NA	NA	NA
27-Jan																		
Reactor # 2	6.89	33	20	840	94	85	0.05	<0.08	<20	726	122	NA	NA	NA	NA	NA	NA	NA
30-Jan																		
Reactor # 1	6.56	128	86	990	143	112	0.05	<0.08	<20	593	138	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0
Reactor # 2	6.79	33	27	602	86	80	0.046	<0.08	<20	335	82	<10	<10	<0.5	<0.5	<0.5	<0.5	<1.0

APPENDICES

APPENDIX A

GENERAL FIELD PROTOCOLS

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1.0 GENERAL FIELD PROCEDURES

The following sections outline the general protocols followed during implementation of the Pilot Project at the Site.

2.0 DECONTAMINATION PROCEDURES

2.1 DRILLING EQUIPMENT

Upon mobilization of the drill rig, Geoprobe, or cone penetrometer test rig to the Site and prior to subsurface explorations, the equipment was thoroughly steam-cleaned to remove oil, grease, mud, and other foreign matter. Before explorations at each subsequent testing location, the augers, cutting bits, probes, samplers, drill steel, and associated equipment were decontaminated to prevent cross contamination from the previous drilling activities. Equipment decontamination was accomplished by flushing and wiping the components to remove all visible sediments followed by:

i) steam-cleaning and/or high pressure washing with potable water to remove particulate matter and surface films; and

ii) rinsing thoroughly with potable water.

A decontamination pad was constructed for cleaning of drilling rigs and other equipment. The decontamination pad facilitated capture of cleaning fluids for proper management. Collected decontamination fluids were managed in accordance with the protocols described in Section 6.0.

2.2 SAMPLING EQUIPMENT

Sampling equipment was decontaminated prior to field use and after each sample was collected to prevent cross-contamination between samples. Whenever practicable, dedicated sampling equipment was used to minimize the potential for sample cross contamination. Decontamination of equipment used for collection of samples for laboratory analyses was performed as follows:

i) wash with potable water and Alconox™, Liquinox™ or similar low-phosphate detergent using a brush, if necessary, to remove all visible foreign matter;

ii) rinse thoroughly with potable water;

iii) rinse thoroughly with distilled water; and

iv) allow the equipment to air dry on a clean plastic sheet as long as possible.

Following the final rinse, equipment was visually inspected to verify that it was free of soil particulates and other solid material that could contribute to possible sample cross-contamination.

Similarly, well casings and screens for monitoring wells, extraction wells and reinjection wells were thoroughly cleaned prior to use using the following procedure:

i) steam-cleaning and/or high pressure washing with potable water to remove particulate matter and surface films;

ii) rinse thoroughly with potable water; and

iii) air dry as long as possible and wrap in clean plastic sheeting for delivery to installation site.

Fluids used for cleaning were not recycled. Collected decontamination fluids were managed in accordance with the protocols described in Section 6.0.

3.0 PILOT UNIT CONSTRUCTION

3.1 EXTRACTION AND REINJECTION WELL INSTALLATION

Extraction and reinjection wells were installed using hollow-stem auger drilling methods. Specific installation protocols for the extraction/reinjection wells are described below:

i) Drilling equipment and well construction materials were decontaminated prior to use as discussed in Section 2.1.

ii) The boreholes were advanced to the target depth using 4.25-inch inside diameter hollow-stem augers.

iii) Continuous split-spoon samples were collected at extraction well locations EW-2 and EW-4, since these borings were the pilot borings.

iv) The boreholes for the remaining extraction/reinjection wells were advanced without collecting formation samples. The lead auger was fitted with an expendable knockout plug to prevent the entry of sand.

v) The borehole was advanced to the target depth and potable water was added to the augers to minimize sand heave. The knockout plug was pushed off the bottom of the lead auger when the desired depth was reached.

vi) A nominal 2-inch diameter (No. 10 slot) polyvinyl chloride (PVC) well screen, 5 feet in length, attached to a sufficient length of 2-inch diameter schedule 40 PVC riser pipe to extend to approximately 2 feet above the ground surface was placed into the borehole through the augers.

vii) A filter sand pack consisting of No. 30 silica sand was installed to a minimum height of 2 feet above the top of the well screen as the augers were removed.

viii) A minimum 2-foot thick seal consisting of 3/8-inch bentonite chips was placed on top of the sand pack.

ix) The remaining borehole annulus was sealed to within 2 feet of the surface using bentonite chips.

x) The upper 2 feet of the annulus was filled with drilling cuttings.

xi) The well heads were fitted with a watertight, lockable cap.

A geologist described collected soil samples in accordance with the Unified Soil Classification System (USCS).

3.2 MONITORING WELL NESTS

Monitoring well nests were installed using hollow-stem auger drilling methods. Monitoring well clusters were constructed at the surface using precleaned well materials (see Section 2.1). Each individual monitoring well was constructed of 0.75-inch nominal diameter PVC well materials attached to 12-inch lengths of No. 10 slot PVC well screen. The monitoring well screens were wrapped in filter cloth prior to installation to minimize the intrusion of silt into the well annulus. Clustered groundwater monitoring wells were installed using the following procedures.

i) Prior to set up at the borehole location, drilling equipment and well construction materials were decontaminated prior to use as discussed in Section 1.1.

ii) The borehole was advanced to the target depth using 6.25-inch inside diameter hollow-stem augers. The lead auger was fitted with an expendable knockout plug to prevent the entry of sand.

iii) The borehole was advanced approximately 1 foot into the glacial till formation and potable water was added to the augers to minimize sand heave. The knockout plug was pushed off the bottom of the lead auger when the desired depth was reached.

iv) The deepest individual well pipe and screen E was then inserted into the augers such that the deepest monitoring well rested at the glacial till/upper sand unit interface. A filter sand pack consisting of No. 30 silica sand was installed around the individual well screen over an interval that extended from 6-inches below the well screen to a height of approximately 1 foot above the top of the well screen as the augers were removed.

v) A 6-inch thick bentonite chip seal was then installed above the sand pack for the lower well.

vi) This process continued for each successively shallower well. Bentonite seals ranged in thickness from 6-inches to 2 feet in thickness.

vii) Individual well pipes were labeled to avoid possible confusion between nested monitoring wells. Well cluster pipes were labeled with the letters A, B, C, D, and E designating the shallowest to the deepest well in the cluster. The base of the well screens were positioned so that the base of the D well screen was set 3 feet above that of the E well screen, the C well screen was set 3 feet above the D well screen, the B well screen was set 4.5 feet above the C well screen, and the A well screen was set 6.5 feet above the B well screen.

viii) The upper 2.5 feet of the borehole annulus was sealed to the surface using a bentonite grout mixture.

3.3 WELL DEVELOPMENT

Prior to collecting samples or beginning the operational phase of the Pilot Project, the monitoring, extraction and reinjection wells were developed. Well development protocols are described below:

i) The well was surged using a precleaned small-diameter bailer for a period of at least ten minutes.

ii) Water was purged from the well using a precleaned electronic submersible pump and or a peristaltic pump. Purged water was managed as described in Section 5.0.

iii) The pH, temperature, turbidity, and conductivity of the purged groundwater were measured using field instruments. These instruments were calibrated daily according to the manufacturer's specifications. Additionally, observations such as color, odor, and clarity of the purged water were recorded.

iv) Development continued until the turbidity and silt content of the monitoring wells were reduced to the greatest extent practicable and three consistent readings of pH, temperature, and conductivity were recorded.

v) Well development was considered complete when three consecutive readings were within ±0.5 standard units for pH, within ±0.5° Celsius (C) for temperature, and within ±10 percent for conductivity.

vi) Total well depths were measured and recorded following development of the extraction and reinjection wells.

3.4 PRE- AND POST-PILOT PROJECT GROUNDWATER MONITORING

Groundwater samples were collected in accordance with the protocol described below:

i) A new pair of disposable nitrile gloves was used for each sample.

ii) The depth to water in each well was measured to the nearest 0.01 foot using an electronic water level meter.

iii) Prior to sampling, each well was purged using a dedicated section of polyethylene tubing and a peristaltic pump. Purge rates were kept below one liter per minute to ensure turbidity and drawdown were minimized.

iv) Field measurements of pH, conductivity, oxidation-reduction potential (ORP), dissolved oxygen (DO), turbidity, and temperature of the water were obtained during the purging of each well. Field instruments were calibrated in accordance with manufacturer's specifications. Purging was considered complete when three consecutive readings were within ±0.5 standard units for pH, within ±0.5°C for temperature, and within ±10 percent for conductivity or a maximum of three well volumes were purged.

v) After purging the required volume, groundwater samples were collected. Containers were filled using techniques that minimize sample agitation. Groundwater samples were collected from the equipment used to purge the well as described above. Groundwater samples were collected in order of decreasing analyte volatility.

vi) Samples were labeled with a unique sample identification and placed into an iced cooler, pending sample pickup by the project laboratory.

4.0 FIELD LOG DOCUMENTATION

A field book or appropriate field forms were used to record information collected during the Pilot Project. The field logbook is a bound document with consecutively numbered pages. The entries for each day were begun on a new page, which was dated. All entries were made only in indelible ink. Corrections were made by marking through the error with a single line, to remain legible, and initialing this action followed by writing the correction.

Upon completion of the fieldwork or during periods when fieldwork is not scheduled, the field logbooks are maintained in CRA's Chicago office. Ultimately, after completion of all stages of fieldwork, the logbooks will be maintained in the document file in CRA's Chicago, Illinois office.

The following information was recorded in the field logbook or on appropriate field forms for each sample collected:

i) Site location identification;

ii) unique sample identification number;

iii) date and time (in 2400-hour time format) of sample collection;

iv) weather conditions;

v) designation as to the type of sample (groundwater, soil, etc.);

vi) designation as to the means of collection (grab, bailer, etc.);

vii) name of sampler;

viii) analyses to be performed on sample;

ix) any other relevant comments such as odor, staining, texture, filtering, preservation, etc.; and

x) sample location.

Records of equipment maintenance and calibration, and observations on equipment performance were also recorded in the field logbook. Alternatively, CRA utilized standard forms to record information such as stratigraphy, well construction, and well sampling.

5.0 SAMPLE HANDLING AND DOCUMENTATION PROTOCOLS

5.1 SAMPLE LABELING

Each sample was labeled with a unique sample number that facilitated tracking and cross-referencing of sample information. The sample numbering system used is described as follows:

Example: GW-MMDDYY-XX-001

where:

GW	-	designates types of sample (GW-groundwater, S-soil, SD-sediment, SW-surface water)
MMDDYY	-	designates date of collection presented as month/day/year
XX	-	designates sampler's initials
001	-	designates sequential number starting with 001 at the start of the project

Field blank and field duplicate samples also were numbered with a unique sample number, consistent with the numbering system described above, to prevent laboratory bias of field QC samples.

5.2 SAMPLE CONTAINERS AND HANDLING

Water samples collected during the Pilot Project were analyzed for TCL VOCs, TCL semivolatile organic compounds (SVOCs), ammonia, bromide, nitrate, total cyanide, thiocyanate, alkalinity, total arsenic, total phenol, and total suspended solids by En Chem Inc. of Madison, Wisconsin. Table 3.5 of the Pilot Project Report summarizes the analytical methods for the Pilot Project. Required sample containers, sample preservation methods, maximum holding times, and filling instructions were provided in the QAPP. All samples were placed in appropriate sample containers, labeled, and properly sealed. Sample labels identified the sample containers. Sample labels included sample number, date of collection, and analyses to be performed. Samples were cushioned within the shipping coolers by the use of bubble pack. Samples were kept cool by the use of plastic bags of ice, as required.

Samples were shipped by laboratory courier on a regular basis to the project laboratory. The exception to this was samples that were collected on a Saturday, Sunday or holiday. For samples collected on a Sunday or holiday, additional ice was placed in the coolers, as required, and the coolers were sealed and were kept under surveillance by a CRA representative or, when not under direct surveillance by CRA personnel, samples collected were kept locked in the office trailer. Immediately prior to shipment, on the next business day, the CRA representative checked the samples to ensure that the samples had been stored appropriately and had not been tampered with.

The sample custodian checked the contents of the cooler with those samples listed on the chain-of-custody form. If damage or discrepancies were noticed, they were recorded in the remark column of the chain-of-custody form, dated and signed. They were reported to the laboratory supervisor who would inform the laboratory manager and QA officer.

5.3 CHAIN-OF-CUSTODY FORMS

Chain-of-custody records were used to track all samples from time of sampling to the arrival of samples at the laboratory. Each shipping container being sent to the laboratory contained a chain-of-custody form. The chain-of-custody form consists of four copies, which are distributed to the sampler, to the shipper, to the contract laboratory, and to the office file of the engineer. The sampler and shipper maintain their copies while the other two copies are enclosed in a waterproof enclosure within the sample container. The laboratory, upon receiving the samples, completed the remaining copies. The laboratory will maintain one copy for its records. The executed original was returned to the engineer with the data deliverables package.

5.4 QUALITY CONTROL

In accordance with the approved Work Plan, QC samples were not collected during operation of the E/R and E Units. QC samples were only collected during the pre-test and post-test monitoring described in Section 3.4. The level of QC effort is discussed in the QAPP.

6.0 WASTE HANDLING PROTOCOLS

Wastes generated during the investigation included general refuse, soil cuttings from soil borings and monitoring wells, decontamination fluids, extracted groundwater, drilling fluids, and monitoring well purging fluids. General refuse, including plastic sheeting, buckets, paper bags, etc., were disposed of in waste receptacles. Daily refuse and personal protective equipment (PPE) were collected in plastic bags and disposed of as necessary to keep the Pilot Project area neat. Soil cuttings from monitoring, extraction, and reinjection well installations were placed into labeled 55-gallon drums and staged adjacent to the remedial investigation drum storage area.

Decontamination and well development fluids were initially staged in labeled 55-gallon drums. Following collection of the treatability sample, these fluids were transferred into one of four holding frac tanks.

B

APPENDIX B

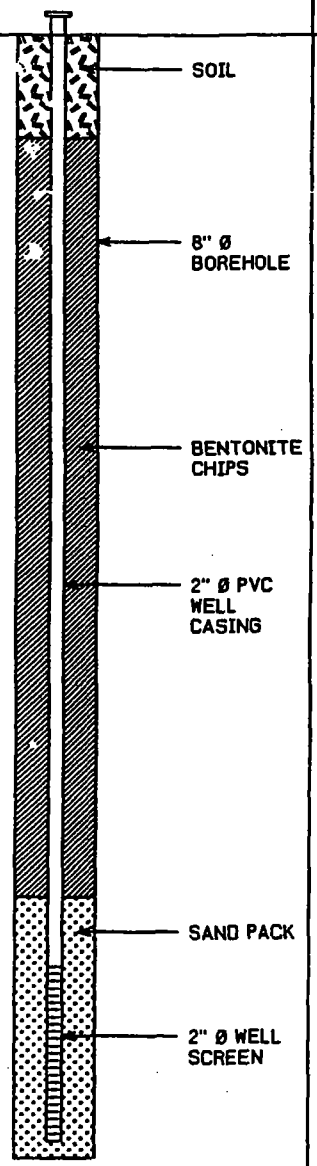
STRATIGRAPHIC AND INSTRUMENTATION LOGS

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(CL-03)
Page 1 of 1

PROJECT NAME: WAUKEGAN MANUFACTURED GAS AND COKE PLANT
HOLE DESIGNATION: EW-1
PROJECT NUMBER: 15670
DATE COMPLETED: AUGUST 3, 2000
CLIENT: WCP COMMITTEE
DRILLING METHOD: 4 1/4" HSA
LOCATION: WAUKEGAN, ILLINOIS
CRA SUPERVISOR: W. POCHRON
DRILLING CONTRACTOR: BOART LONGYEAR
DRILLER: RANDY RADKEY

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	*587.08* *584.7*					
	REFER TO THE STRATTIGRAPHIC AND INSTRUMENTATION LOG FOR EW-2 FOR STRATIGRAPHIC DETAILS						
32.5	END OF HOLE @ 32.5ft BGS	*552.2*					



SCREEN DETAILS
Screened Interval:
27.0 to 32.0ft BGS
Length: 5.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
25.0 to 32.5ft BGS
Material: Sand #30

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(CL-04)
Page 1 of 1

PROJECT NAME: WAUKEGAN MANUFACTURED GAS AND COKE PLANT
HOLE DESIGNATION: EW-3
PROJECT NUMBER: 15670
DATE COMPLETED: AUGUST 4, 2000
CLIENT: WCP COMMITTEE
DRILLING METHOD: 4 1/4" HSA
LOCATION: WAUKEGAN, ILLINOIS
CRA SUPERVISOR: W. POCHRON
DRILLING CONTRACTOR: BOART LONGYEAR
DRILLER: RANDY RADKEY

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	*587.26* *584.8*					
2.5	REFER TO THE STRATTIGRAPHIC AND INSTRUMENTATION LOG FOR EW-2 FOR STRATIGRAPHIC DETAILS		SOIL				
5.0			8" Ø BOREHOLE				
7.5							
10.0							
12.5			BENTONITE CHIPS				
15.0							
17.5			2" Ø PVC WELL CASING				
20.0							
22.5							
25.0			SAND PACK				
27.5							
30.0			2" Ø WELL SCREEN				
32.5	END OF HOLE @ 32.5ft BGS	*552.3*					
35.0							
37.5							

SCREEN DETAILS
Screened Interval:
27.0 to 32.0ft BGS
Length: 5.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
25.0 to 32.5ft BGS
Material: Sand #30

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(CL-07)
Page 1 of 1

PROJECT NAME: WAUKEGAN MANUFACTURED GAS AND COKE PLANT HOLE DESIGNATION: RW-2
PROJECT NUMBER: 15670 DATE COMPLETED: AUGUST 8, 2000
CLIENT: WCP COMMITTEE DRILLING METHOD: 4 1/4" HSA
LOCATION: WAUKEGAN, ILLINOIS CRA SUPERVISOR: W. POCHRON
DRILLING CONTRACTOR: BOART LONGYEAR DRILLER: RANDY RADKEY

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	*587.28* *585.0*					
-2.5 -5.0 -7.5 -10.0 -12.5 -15.0 -17.5 -20.0 -22.5 -25.0 -27.5 -30.0 -32.5 -35.0 -37.5	REFER TO THE STRATTIGRAPHIC AND INSTRUMENTATION LOG FOR EW-2 FOR STRATIGRAPHIC DETAILS		SOIL 8" Ø BOREHOLE BENTONITE CHIPS 2" Ø PVC WELL CASING SAND PACK 2" Ø WELL SCREEN				
	END OF HOLE @ 33.0ft BGS	*552.0*					

SCREEN DETAILS
Screened Interval:
27.0 to 32.0ft BGS
Length: 5.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
25.0 to 33.0ft BGS
Material: Sand #30

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(CL-09)
Page 1 of 1

PROJECT NAME: WAUKEGAN MANUFACTURED GAS AND COKE PLANT
HOLE DESIGNATION: RW-4
PROJECT NUMBER: 15670
DATE COMPLETED: AUGUST 8, 2000
CLIENT: WCP COMMITTEE
DRILLING METHOD: 4 1/4" HSA
LOCATION: WAUKEGAN, ILLINOIS
CRA SUPERVISOR: W. POCHRON
DRILLING CONTRACTOR: BOART LONGYEAR
DRILLER: RANDY RADKEY

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	*587.19* *584.7*					
-2.5 -5.0 -7.5 -10.0 -12.5 -15.0 -17.5 -20.0 -22.5 -25.0 -27.5 -30.0 -32.5	REFER TO THE STRATTIGRAPHIC AND INSTRUMENTATION LOG FOR EW-2 FOR STRATIGRAPHIC DETAILS		SOIL 8" Ø BOREHOLE BENTONITE CHIPS 2" Ø PVC WELL CASING SAND PACK 2" Ø WELL SCREEN				
-35.0 -37.5	END OF HOLE @ 33.0ft BGS	*551.7*	SCREEN DETAILS Screened Interval: 27.0 to 32.0ft BGS Length: 5.0ft Diameter: 2" Slot Size: #10 Material: PVC Sand Pack: 25.0 to 33.0ft BGS Material: Sand #30				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(CL-11)
Page 1 of 1

PROJECT NAME: WAUKEGAN MANUFACTURED GAS AND COKE PLANT
HOLE DESIGNATION: RW-6
PROJECT NUMBER: 15670
DATE COMPLETED: AUGUST 8, 2000
CLIENT: WCP COMMITTEE
DRILLING METHOD: 4 1/4" HSA
LOCATION: WAUKEGAN, ILLINOIS
CRA SUPERVISOR: W. POCHRON
DRILLING CONTRACTOR: BOART LONGYEAR
DRILLER: RANDY RADKEY

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	*587.36* *585.0*					
-2.5	REFER TO THE STRATTIGRAPHIC AND INSTRUMENTATION LOG FOR EW-2 FOR STRATIGRAPHIC DETAILS		SOIL				
-5.0			8" Ø BOREHOLE				
-7.5							
-10.0							
-12.5			BENTONITE CHIPS				
-15.0							
-17.5			2" Ø PVC WELL CASING				
-20.0							
-22.5							
-25.0			SAND PACK				
-27.5							
-30.0			2" Ø WELL SCREEN				
-32.5							
	END OF HOLE @ 33.0ft BGS	*552.0*					
-35.0							
-37.5							

SCREEN DETAILS
Screened Interval:
27.0 to 32.0ft BGS
Length: 5.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
25.0 to 33.0ft BGS
Material: Sand #30

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: WAUKEGAN MANUFACTURED GAS AND COKE PLANT
PROJECT NUMBER: 15670
CLIENT: WCP COMMITTEE
LOCATION: WAUKEGAN, ILLINOIS
DRILLING CONTRACTOR: BOART LONGYEAR

HOLE DESIGNATION: WN-2
DATE COMPLETED: AUGUST 3, 2000
DRILLING METHOD: 6 1/4" HSA
CRA SUPERVISOR: S. CORIER
DRILLER: R. RADKEY

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUNDSURFACE ELEVATION	584.7	E D C B A				

REFER TO THE STRATIGRAPHIC AND INSTRUMENTATION LOG FOR EW-2 FOR STRATIGRAPHIC DETAILS

2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
22.5
25.0
27.5
30.0
32.5
35.0
37.5

CONSTRUCTION DETAILS

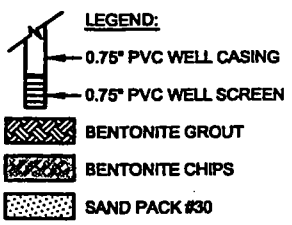
WN-2A — TOP OF CASING 586.78
Screened Interval: 13.5 to 14.5 ft. BGS
Length: 1.0 ft.
Diameter: 0.75"
Slot Size #10
Material: PVC
Sand Pack: 12.5 to 15.0 ft. BGS
Material: SAND #30

WN-2B — TOP OF CASING 586.82
Screened Interval: 20.0 21.0 ft. BGS
Length: 1.0 ft.
Diameter: 0.75"
Slot Size #10
Material: PVC
Sand Pack: 19.0 to 21.5 ft. BGS
Material: SAND #30

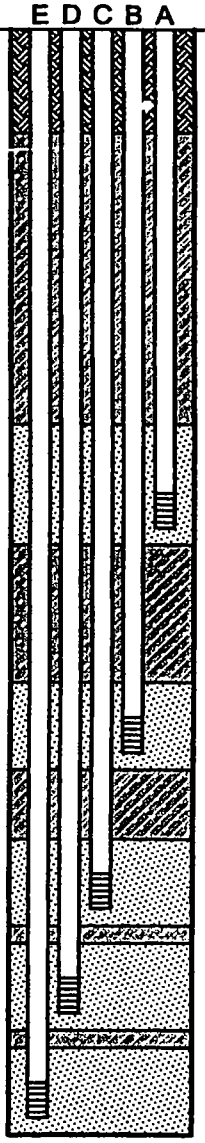
WN-2C — TOP OF CASING 586.87
Screened Interval: 24.5 to 25.5 ft. BGS
Length: 1.0 ft.
Diameter: 0.75"
Slot Size #10
Material: PVC
Sand Pack: 23.5 to 26.0 ft. BGS
Material: SAND #30

WN-2D — TOP OF CASING 586.86
Screened Interval: 27.5 to 28.5 ft. BGS
Length: 1.0 ft.
Diameter: 0.75"
Slot Size #10
Material: PVC
Sand Pack: 26.5 to 29.0 ft. BGS
Material: SAND #30

WN-2E — TOP OF CASING 587.03
Screened Interval: 30.5 to 31.5 ft. BGS
Length: 1.0 ft.
Diameter: 0.75"
Slot Size #10
Material: PVC
Sand Pack: 29.5 to 32.0 ft. BGS
Material: SAND #30



NOTE:
WELL SCREENS WRAPPED WITH FILTER FABRIC



NOTE: MEASURING POINT ELEVATION MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

PROJECT NAME: WAUKEGAN MANUFACTURED GAS AND COKE PLANT
PROJECT NUMBER: 15670
CLIENT: WCP COMMITTEE
LOCATION: WAUKEGAN, ILLINOIS
DRILLING CONTRACTOR: BOART LONGYEAR

HOLE DESIGNATION: WN-3
DATE COMPLETED: AUGUST 7, 2000
DRILLING METHOD: 6 1/4" HSA
CRA SUPERVISOR: S. CORDIER
DRILLER: R. RADKEY

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	GROUNDSURFACE ELEVATION	584.7	E D C B A				

REFER TO THE STRATIGRAPHIC AND INSTRUMENTATION LOG FOR EW-4 FOR STRATIGRAPHIC DETAILS

2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
22.5
25.0
27.5
30.0
32.5
35.0
37.5

CONSTRUCTION DETAILS

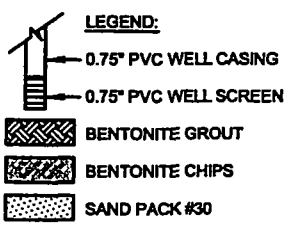
WN-3A — TOP OF CASING 587.24
Screened Interval: 12.0 to 13.0 ft. BGS
Length: 1.0 ft.
Diameter: 0.75"
Slot Size #10
Material: PVC
Sand Pack: 11.0 to 13.5 ft. BGS
Material: SAND #30

WN-3B — TOP OF CASING 587.22
Screened Interval: 18.5 to 19.5 ft. BGS
Length: 1.0 ft.
Diameter: 0.75"
Slot Size #10
Material: PVC
Sand Pack: 17.5 to 20.0 ft. BGS
Material: SAND #30

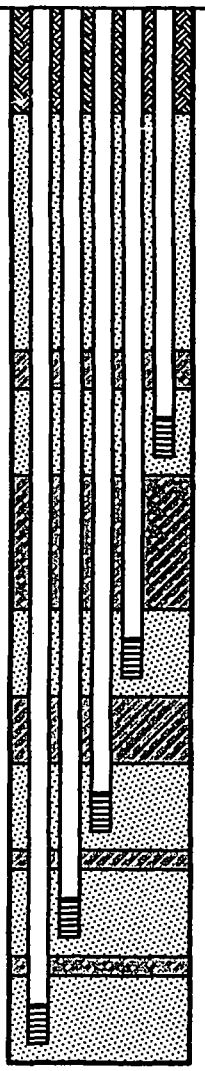
WN-3C — TOP OF CASING 587.22
Screened Interval: 23.0 to 24.0 ft. BGS
Length: 1.0 ft.
Diameter: 0.75"
Slot Size #10
Material: PVC
Sand Pack: 22.0 to 24.0 ft. BGS
Material: SAND #30

WN-3D — TOP OF CASING 587.21
Screened Interval: 26.0 to 27.0 ft. BGS
Length: 1.0 ft.
Diameter: 0.75"
Slot Size #10
Material: PVC
Sand Pack: 25.0 to 27.5 ft. BGS
Material: SAND #30

WN-3E — TOP OF CASING 587.23
Screened Interval: 29.0 to 30.0 ft. BGS
Length: 1.0 ft.
Diameter: 0.75"
Slot Size #10
Material: PVC
Sand Pack: 28.0 to 31.0 ft. BGS
Material: SAND #30



NOTE:
WELL SCREENS WRAPPED WITH FILTER FABRIC



NOTE: MEASURING POINT ELEVATION MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

APPENDIX C

- EN CHEM LABORATORY REPORTS
- APPENDIX C GRAPHS
- APPENDIX L GRAPHS
- APPENDIX M GRAPHS
- APPENDIX N GRAPHS
- APPENDIX O GRAPHS
- APPENDIX P GRAPHS
- LABORATORY QA/QC REPORTS – SEE ATTACHMENT 1

COMPACT DISK FILE INDEX
WAUKEGAN MANUFACTURED GAS COKE PLANT SITE
WAUKEGAN, ILLINOIS

Title	*Folder*	*Filename*	*File Path*
WN1,2/EW1,2,3 BROMIDE	15670-AppC-Graphs	15670-AppC-Bromide.xls	\15670-RPT6-CDFiles\15670-App-C Electronic Files\15670-AppC-Graphs\15670-AppC-Bromide.xls
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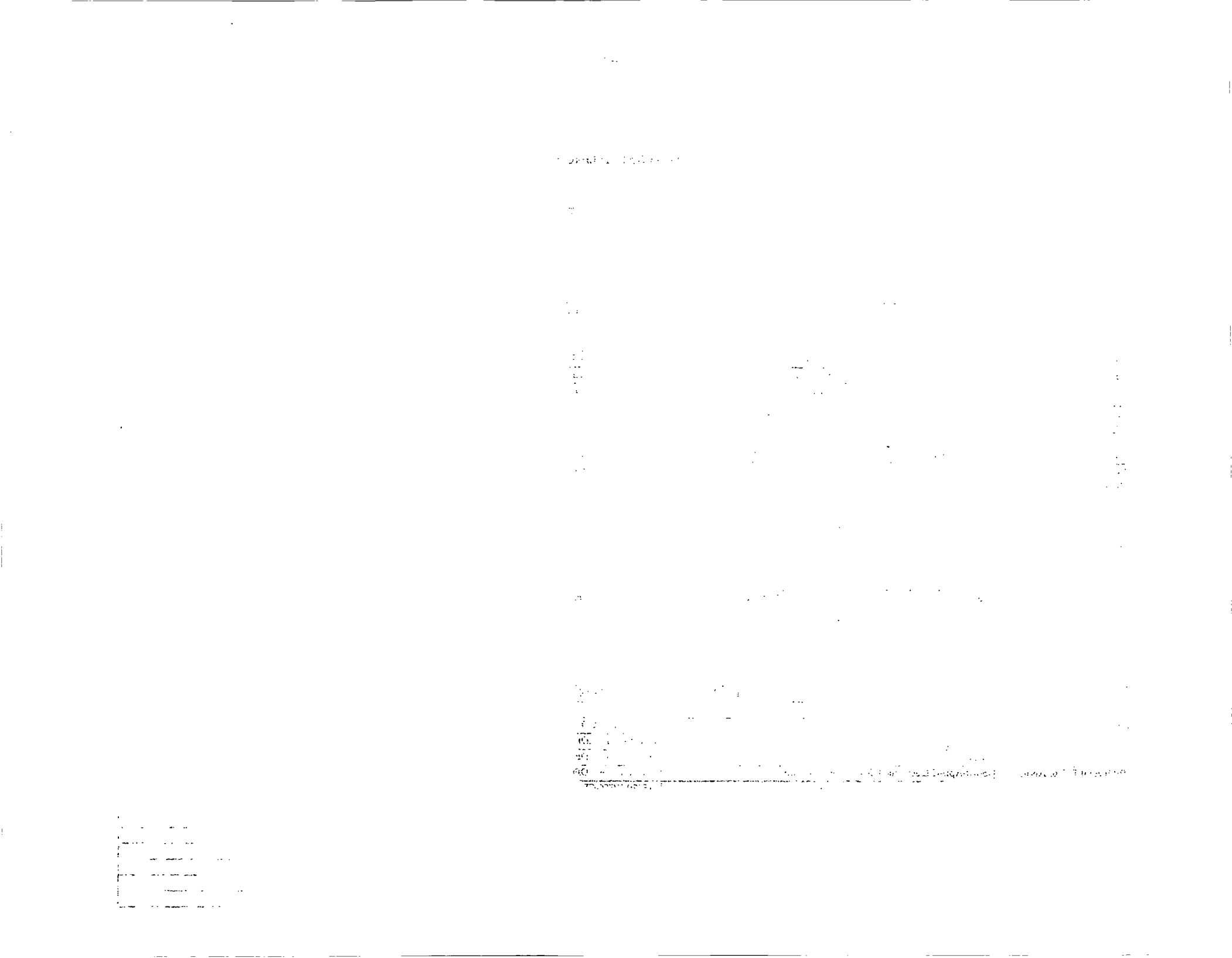

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APPENDIX D

DATA VALIDATION MEMORANDUM

CONESTOGA-ROVERS & ASSOCIATES

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MEMORANDUM

TO: Alan Van Norman REF. NO.: 15670

FROM: Steve Castagneri/lg/2 DATE: January 19, 2001

C.C.: Steve Day, Steve Wanner

RE: **Data Quality Assessment and Validation for the Goundwater Samples Collected from the Waukegan Manufactured Gas and Coke Plant Site in Waukegan, Illinois**

The following details a data quality assessment and validation for the groundwater samples collected October 2 through December 18, 2000 from the Waukegan Manufactured Gas and Coke Plant Site in Waukegan, Illinois. The samples identified in Table 1 were analyzed for the parameters listed in Table 2 by Enchem Inc. of Madison, Wisconsin. The analytical methods are identified in Table 2. The quality assurance criteria used to assess the data were established by the methods and the quality assurance project plan[1].

Holding Time Periods

The holding time periods are presented in Table 3. Table 4 presents the qualified data resulting from violation of required holding time periods.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by the data from concurrent preparation and analysis of method blank samples. 1,2-Dichloroethane, trichloroethene, bis (2-ethylhexyl) phthalate, and acetone were detected in three method blank samples. However these compounds were not detected in the associated samples or the sample concentration was greater than 10 times the concentration found in the method blank and data qualification was not required. Target analytes were not detected in the remaining method blank samples.

Preparation Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by the data from concurrent preparation and analysis of preparation blank samples for the inorganic analyses. Target analytes were not detected in the preparation blank samples.

[1] Application of quality assurance criteria was consistent with the relevant criteria in "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-99/008, October 1999 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", EPA-540/R-94-013, February 1994.

REGISTERED COMPANY FOR ISO 9001 ENGINEERING DESIGN

Surrogate Compound Analyses

Individual sample performance for the organic analyses was monitored by assessing surrogate compound percent recovery data. The surrogate compound percent recovery data for the majority of the SVOC analyses could not be assessed as the surrogates were diluted out as a result of high concentrations of target analytes. Data qualification in this instance is not required. The remaining surrogate compound percent recovery data were acceptable.

Laboratory Control Sample (LCS)/Duplicate LCS Analyses

LCS and Duplicate LCS sample analyses were performed to monitor the accuracy and precision of the laboratory preparation and analysis methods. Table 5 presents the qualified data resulting from violation of LCS/Duplicate LCS percent recovery and relative percent difference (RPD) acceptance criteria. The remaining LCS and Duplicate LCS percent recovery and RPD data were acceptable.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Sample Analyses

To assess the accuracy and precision of the analytical methods relative to the sample matrices, MS/MSD percent recoveries and RPDs were determined.

The SVOC MS/MSD sample data could not be assessed as a result of high concentration of SVOCs in the MS/MSD samples. Data qualification of these samples was not required. Several inorganic MS/MSD samples had native concentrations of target analytes present at concentrations greater than four times the spike concentration; therefore, the percent recovery data for these samples were not further evaluated. The percent recoveries for several analytes exceeded the upper acceptance limit in select organic MS/MSD samples. However, these analytes were not detected in the associated samples and data qualification was not required. Table 6 presents the qualified data resulting from violation of MS/MSD percent recovery acceptance criteria. The remaining MS/MSD percent recovery and RPD data were acceptable.

Laboratory Duplicate Sample Analyses - Inorganics

The precision of the inorganics methods was monitored by assessing the RPD data from laboratory duplicate sample analyses. Table 7 presents the qualified data resulting from violation of duplicate RPD acceptance criteria. The remaining laboratory duplicate RPD data were acceptable.

Field Quality Assurance/Quality Control (QA/QC)

The field QA/QC consisted of 29 trip blank samples and four field duplicate sample sets.

To monitor potential sample cross-contamination by VOCs during sample transportation and storage, trip blank samples were submitted to the laboratory for VOC analysis with each shipping cooler containing VOC samples. Acetone was detected in one trip blank sample; therefore the acetone data for the associated sample, GW-112000-WP-667, should be qualified as not detected (U) at the reported acetone concentration (53 µg/L). Target analytes were not detected in the remaining trip blank samples.

Overall precision for the sampling and analysis event was monitored by the results of field duplicate sample sets. Table 8 summarizes detected analyte data from the field duplicate sample sets. The RPD

ılculated for total phenolics from field duplicate sample set GW-100200-WP-001/002 exceeded the advisory limit and the data should be qualified as estimated (J). In addition, the RPD calculated for phenol from field duplicate sample set GW-100800-WP-026/027 exceeded the advisory limit and the data should be qualified as estimated (J). Furthermore, the RPD for arsenic from field duplicate set GW-112700-WP-686/687 exceeded the advisory limit and should be qualified as estimated (J). The remaining RPD data were acceptable.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision and are suitable for their intended use with the qualifications noted.

Attachments

TABLE 1

SAMPLE IDENTIFICATION NUMBERS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample ID	*Sample ID*	*Sample ID*	*Sample ID*
GW-100200-WP-001	GW-100900-WP-044	GW-101300-WP-102	GW-101700-WP-154
GW-100200-WP-002	GW-100900-WP-048	GW-101400-WP-103	GW-101800-WP-155
GW-100200-WP-003	GW-100900-WP-049	GW-101400-WP-104	GW-101800-WP-156
GW-100200-WP-004	GW-101000-WP-050	GW-101400-WP-105	GW-101800-WP-157
GW-100200-WP-005	GW-101000-WP-051	GW-101400-WP-106	GW-101800-WP-158
GW-100200-WP-006	GW-101000-WP-052	GW-101400-WP-107	GW-101800-WP-159
GW-100200-WP-007	GW-101000-WP-053	GW-101400-WP-108	GW-101800-WP-160
GW-100400-WP-008	GW-101000-WP-054	GW-101400-WP-109	GW-101800-WP-161
GW-100400-WP-009	GW-101000-WP-058	GW-101400-WP-110	GW-101800-WP-162
GW-100400-WP-010	GW-101000-WP-059	GW-101400-WP-114	GW-101800-WP-163
GW-100400-WP-011	GW-101100-WP-060	GW-101400-WP-115	GW-101800-WP-164
GW-100400-WP-012	GW-101100-WP-061	GW-101500-WP-116	GW-101800-WP-170
GW-100500-WP-013	GW-101100-WP-062	GW-101500-WP-117	GW-101900-WP-171
GW-100500-WP-014	GW-101100-WP-063	GW-101500-WP-118	GW-101900-WP-172
GW-100500-WP-015	GW-101100-WP-064	GW-101500-WP-119	GW-101900-WP-173
GW-100500-WP-016	GW-101100-WP-065	GW-101500-WP-120	GW-101900-WP-174
GW-100500-WP-017	GW-101100-WP-066	GW-101500-WP-121	GW-101900-WP-175
GW-100500-WP-018	GW-101100-WP-067	GW-101500-WP-122	GW-101900-WP-176
GW-100500-WP-019	GW-101100-WP-068	GW-101500-WP-123	GW-101900-WP-177
GW-100700-WP-020	GW-101100-WP-069	GW-101500-WP-124	GW-101900-WP-178
GW-100800-WP-021	GW-101100-WP-070	GW-101500-WP-125	GW-101900-WP-179
GW-100800-WP-022	GW-101100-WP-071	GW-101500-WP-129	GW-101900-WP-180
GW-100800-WP-023	GW-101100-WP-072	GW-101500-WP-130	GW-101900-WP-181
GW-100800-WP-024	GW-101100-WP-076	GW-101600-WP-131	GW-101900-WP-182
GW-100800-WP-025	GW-101100-WP-077	GW-101600-WP-132	GW-101900-WP-183
GW-100800-WP-026	GW-101200-WP-078	GW-101600-WP-133	GW-101900-WP-184
GW-100800-WP-027	GW-101200-WP-079	GW-101600-WP-134	GW-102000-WP-185
GW-100800-WP-028	GW-101200-WP-080	GW-101600-WP-135	GW-102000-WP-186
GW-100800-WP-029	GW-101200-WP-081	GW-101600-WP-136	GW-102000-WP-187
GW-100800-WP-030	GW-101200-WP-082	GW-101600-WP-137	GW-102000-WP-188
GW-100800-WP-031	GW-101200-WP-086	GW-101600-WP-138	GW-102000-WP-189
GW-100900-WP-032	GW-101200-WP-087	GW-101600-WP-139	GW-102000-WP-190
GW-100900-WP-033	GW-101300-WP-088	GW-101600-WP-140	GW-102000-WP-191
GW-100900-WP-034	GW-101300-WP-089	GW-101600-WP-141	GW-102000-WP-192
GW-100900-WP-035	GW-101300-WP-090	GW-101600-WP-145	GW-102000-WP-193
GW-100900-WP-036	GW-101300-WP-091	GW-101600-WP-146	GW-102000-WP-194
GW-100900-WP-037	GW-101300-WP-092	GW-101700-WP-147	GW-102000-WP-195
GW-100900-WP-038	GW-101300-WP-093	GW-101700-WP-148	GW-102100-WP-196
GW-100900-WP-039	GW-101300-WP-094	GW-101700-WP-149	GW-102100-WP-197
GW-100900-WP-040	GW-101300-WP-095	GW-101700-WP-150	GW-102100-WP-198
GW-100900-WP-041	GW-101300-WP-096	GW-101700-WP-151	GW-102100-WP-199
GW-100900-WP-042	GW-101300-WP-097	GW-101700-WP-152	GW-102100-WP-200
GW-100900-WP-043	GW-101300-WP-101	GW-101700-WP-153	GW-102100-WP-201

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WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample ID	*Sample ID*	*Sample ID*	*Sample ID*
GW-102100-WP-202	GW-102400-WP-245	GW-102700-WP-298	GW-103000-WP-354
GW-102100-WP-203	GW-102400-WP-2464	GW-102700-WP-299	GW-103000-WP-355
GW-102100-WP-204	GW-102400-WP-247	GW-102700-WP-300	GW-103000-WP-356
GW-102200-WP-205	GW-102400-WP-248	GW-102700-WP-301	GW-103000-WP-357
GW-102200-WP-206	GW-102400-WP-249	GW-102700-WP-302	GW-103000-WP-358
GW-102200-WP-207	GW-102400-WP-250	GW-102800-WP-308	GW-103000-WP-359
GW-102200-WP-208	GW-102500-WP-251	GW-102800-WP-309	GW-103000-WP-360
GW-102200-WP-209	GW-102500-WP-252	GW-102800-WP-310	GW-103000-WP-361
GW-102200-WP-210	GW-102500-WP-253	GW-102800-WP-311	GW-103000-WP-362
GW-102200-WP-211	GW-102500-WP-254	GW-102800-WP-312	GW-103000-WP-363
GW-102200-WP-212	GW-102500-WP-255	GW-102800-WP-313	GW-103000-WP-364
GW-102200-WP-213	GW-102500-WP-256	GW-102800-WP-314	GW-103000-WP-365
GW-102200-WP-214	GW-102500-WP-257	GW-102800-WP-315	GW-103100-WP-371
GW-102200-WP-215	GW-102500-WP-258	GW-102800-WP-316	GW-103100-WP-372
GW-102200-WP-216	GW-102500-WP-259	GW-102800-WP-317	GW-103100-WP-373
GW-102200-WP-217	GW-102500-WP-260	GW-102800-WP-318	GW-103100-WP-374
GW-102200-WP-218	GW-102500-WP-261	GW-102800-WP-319	GW-103100-WP-375
GW-102200-WP-219	GW-102500-WP-262	GW-102800-WP-320	GW-103100-WP-376
GW-102200-WP-220	GW-102500-WP-263	GW-102800-WP-321	GW-103100-WP-377
GW-102300-WP-221	GW-102500-WP-264	GW-102900-WP-325	GW-103100-WP-378
GW-102300-WP-222	GW-102600-WP-270	GW-102900-WP-326	GW-103100-WP-379
GW-102300-WP-223	GW-102600-WP-271	GW-102900-WP-327	GW-103100-WP-380
GW-102300-WP-224	GW-102600-WP-272	GW-102900-WP-328	GW-103100-WP-381
GW-102300-WP-225	GW-102600-WP-273	GW-102900-WP-329	GW-103100-WP-382
GW-102300-WP-226	GW-102600-WP-274	GW-102900-WP-330	GW-103100-WP-383
GW-102300-WP-227	GW-102600-WP-275	GW-102900-WP-331	GW-110100-WP-384
GW-102300-WP-228	GW-102600-WP-276	GW-102900-WP-332	GW-110100-WP-385
GW-102300-WP-229	GW-102600-WP-277	GW-102900-WP-333	GW-110100-WP-386
GW-102300-WP-230	GW-102600-WP-278	GW-102900-WP-334	GW-110100-WP-387
GW-102300-WP-231	GW-102600-WP-279	GW-102900-WP-335	GW-110100-WP-388
GW-102300-WP-232	GW-102600-WP-280	GW-102900-WP-336	GW-110100-WP-389
GW-102300-WP-233	GW-102600-WP-281	GW-102900-WP-337	GW-110100-WP-390
GW-102300-WP-234	GW-102600-WP-282	GW-102900-WP-338	GW-110100-WP-391
GW-102300-WP-235	GW-102600-WP-283	GW-102900-WP-339	GW-110100-WP-392
GW-102300-WP-236	GW-102700-WP-289	GW-102900-WP-340	GW-110100-WP-393
GW-102400-WP-237	GW-102700-WP-290	GW-102900-WP-346	GW-110100-WP-394
GW-102400-WP-238	GW-102700-WP-291	GW-103000-WP-347	GW-110100-WP-395
GW-102400-WP-239	GW-102700-WP-292	GW-103000-WP-348	GW-110100-WP-396
GW-102400-WP-240	GW-102700-WP-293	GW-103000-WP-349	GW-110100-WP-397
GW-102400-WP-241	GW-102700-WP-294	GW-103000-WP-350	GW-110200-WP-398
GW-102400-WP-242	GW-102700-WP-295	GW-103000-WP-351	GW-110200-WP-399
GW-102400-WP-243	GW-102700-WP-296	GW-103000-WP-352	GW-110200-WP-400
GW-102400-WP-244	GW-102700-WP-297	GW-103000-WP-353	GW-110200-WP-401

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WAUKEGAN, ILLINOIS

Sample ID	*Sample ID*	*Sample ID*	*Sample ID*
GW-110200-WP-402	GW-110500-WP-445	GW-110700-WP-0488	GW-111100-WP-0531
GW-110200-WP-403	GW-110500-WP-446	GW-110800-WP-0489	GW-111100-WP-0532
GW-110200-WP-404	GW-110500-WP-447	GW-110800-WP-0490	GW-111100-WP-0533
GW-110200-WP-405	GW-110500-WP-448	GW-110800-WP-0491	GW-111100-WP-0534
GW-110200-WP-406	GW-110500-WP-449	GW-110800-WP-0492	GW-111100-WP-0535
GW-110200-WP-407	GW-110500-WP-450	GW-110800-WP-0493	GW-111100-WP-0536
GW-110200-WP-408	GW-110500-WP-451	GW-110800-WP-0494	GW-111100-WP-0537
GW-110200-WP-409	GW-110500-WP-452	GW-110800-WP-0495	GW-111100-WP-0538
GW-110200-WP-410	GW-110500-WP-453	GW-110800-WP-0496	GW-111100-WP-0539
GW-110200-WP-411	GW-110500-WP-454	GW-110800-WP-0497	GW-111100-WP-0540
GW-110200-WP-412	GW-110500-WP-455	GW-110800-WP-0498	GW-111100-WP-0541
GW-110200-WP-413	GW-110500-WP-456	GW-110800-WP-0499	GW-111100-WP-0542
GW-110200-WP-414	GW-110500-WP-457	GW-110800-WP-0500	GW-111200-WP-0543
GW-110200-WP-415	GW-110500-WP-458	GW-110800-WP-0501	GW-111200-WP-0544
GW-110200-WP-416	GW-110500-WP-459	GW-110800-WP-0502	GW-111200-WP-0545
GW-110300-WP-417	GW-110500-WP-460	GW-110900-WP-0503	GW-111200-WP-0546
GW-110300-WP-418	GW-110500-WP-461	GW-110900-WP-0504	GW-111200-WP-0547
GW-110300-WP-419	GW-110500-WP-462	GW-110900-WP-0505	GW-111200-WP-0548
GW-110300-WP-420	GW-110600-WP-0463	GW-110900-WP-0506	GW-111200-WP-0549
GW-110300-WP-421	GW-110600-WP-0464	GW-110900-WP-0507	GW-111200-WP-0550
GW-110300-WP-422	GW-110600-WP-0465	GW-110900-WP-0508	GW-111200-WP-0551
GW-110300-WP-423	GW-110600-WP-0466	GW-110900-WP-0509	GW-111200-WP-0552
GW-110300-WP-424	GW-110600-WP-0467	GW-110900-WP-0510	GW-111200-WP-0553
GW-110300-WP-425	GW-110600-WP-0468	GW-110900-WP-0511	GW-111200-WP-0554
GW-110300-WP-426	GW-110600-WP-0469	GW-110900-WP-0512	GW-111200-WP-0555
GW-110300-WP-427	GW-110600-WP-0470	GW-110900-WP-0513	GW-111300-WP-0556
GW-110300-WP-428	GW-110600-WP-0471	GW-110900-WP-0514	GW-111300-WP-0557
GW-110300-WP-429	GW-110600-WP-0472	GW-110900-WP-0515	GW-111300-WP-0558
GW-110400-WP-430	GW-110600-WP-0473	GW-111000-WP-0516	GW-111300-WP-0559
GW-110400-WP-431	GW-110600-WP-0474	GW-111000-WP-0517	GW-111300-WP-0560
GW-110400-WP-432	GW-110600-WP-0475	GW-111000-WP-0518	GW-111300-WP-0561
GW-110400-WP-433	GW-110700-WP-0476	GW-111000-WP-0519	GW-111300-WP-0562
GW-110400-WP-434	GW-110700-WP-0477	GW-111000-WP-0520	GW-111300-WP-0563
GW-110400-WP-435	GW-110700-WP-0478	GW-111000-WP-0521	GW-111300-WP-0564
GW-110400-WP-436	GW-110700-WP-0479	GW-111000-WP-0522	GW-111300-WP-0565
GW-110400-WP-437	GW-110700-WP-0480	GW-111000-WP-0523	GW-111300-WP-0566
GW-110400-WP-438	GW-110700-WP-0481	GW-111000-WP-0524	GW-111300-WP-0567
GW-110400-WP-439	GW-110700-WP-0482	GW-111000-WP-0525	GW-111300-WP-0568
GW-110400-WP-440	GW-110700-WP-0483	GW-111000-WP-0526	GW-111300-WP-0569
GW-110400-WP-441	GW-110700-WP-0484	GW-111000-WP-0527	GW-111300-WP-0570
GW-110400-WP-442	GW-110700-WP-0485	GW-111000-WP-0528	GW-111300-WP-0571
GW-110400-WP-443	GW-110700-WP-0486	GW-111000-WP-0529	GW-111300-WP-0572
GW-110500-WP-444	GW-110700-WP-0487	GW-111100-WP-0530	GW-111300-WP-0573

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WAUKEGAN, ILLINOIS

Sample ID	*Sample ID*	*Sample ID*	*Sample ID*
GW-111300-WP-0574	GW-111600-WP-0617	GW-111800-WP-0660	GW-121800-WP-0703
GW-111300-WP-0575	GW-111600-WP-0618	GW-111800-WP-0661	GW-121800-WP-0704
GW-111400-WP-0576	GW-111600-WP-0619	GW-111800-WP-0662	GW-121800-WP-0705
GW-111400-WP-0577	GW-111600-WP-0620	GW-111800-WP-0663	GW-121800-WP-0706
GW-111400-WP-0578	GW-111600-WP-0621	GW-111800-WP-0664	GW-121800-WP-0707
GW-111400-WP-0579	GW-111700-WP-0622	GW-111800-WP-0665	GW-121800-WP-0708
GW-111400-WP-0580	GW-111700-WP-0623	GW-111800-WP-0666	GW-121800-WP-0709
GW-111400-WP-0581	GW-111700-WP-0624	GW-112000-WP-0667	GW-121800-WP-0710
GW-111400-WP-0582	GW-111700-WP-0625	GW-112000-WP-0668	GW-121800-WP-0711
GW-111400-WP-0583	GW-111700-WP-0626	GW-112000-WP-0669	GW-121800-WP-0712
GW-111400-WP-0584	GW-111700-WP-0627	GW-112000-WP-0670	GW-121800-WP-0713
GW-111400-WP-0585	GW-111700-WP-0628	GW-112000-WP-0671	GW-121800-WP-0714
GW-111400-WP-0586	GW-111700-WP-0629	GW-112000-WP-0672	
GW-111400-WP-0587	GW-111700-WP-0630	GW-112000-WP-0673	
GW-111400-WP-0588	GW-111700-WP-0631	GW-112000-WP-0674	
GW-111500-WP-0589	GW-111700-WP-0632	GW-112000-WP-0675	
GW-111500-WP-0590	GW-111700-WP-0633	GW-112000-WP-0676	
GW-111500-WP-0591	GW-111700-WP-0634	GW-112000-WP-0677	
GW-111500-WP-0592	GW-111700-WP-0635	GW-112000-WP-0678	
GW-111500-WP-0593	GW-111800-WP-0636	GW-112000-WP-0679	
GW-111500-WP-0594	GW-111800-WP-0637	GW-112000-WP-0680	
GW-111500-WP-0595	GW-111800-WP-0638	GW-112000-WP-0681	
GW-111500-WP-0596	GW-111800-WP-0639	GW-112700-WP-0682	
GW-111500-WP-0597	GW-111800-WP-0640	GW-112700-WP-0683	
GW-111500-WP-0598	GW-111800-WP-0641	GW-112700-WP-0684	
GW-111500-WP-0599	GW-111800-WP-0642	GW-112700-WP-0685	
GW-111500-WP-0600	GW-111800-WP-0643	GW-112700-WP-0686	
GW-111500-WP-0601	GW-111800-WP-0644	GW-112700-WP-0687	
GW-111500-WP-0602	GW-111800-WP-0645	GW-112700-WP-0688	
GW-111600-WP-0603	GW-111800-WP-0646	GW-112700-WP-0689	
GW-111600-WP-0604	GW-111800-WP-0647	GW-112700-WP-0690	
GW-111600-WP-0605	GW-111900-WP-0648	GW-112700-WP-0691	
GW-111600-WP-0606	GW-111800-WP-0649	GW-112700-WP-0692	
GW-111600-WP-0607	GW-111800-WP-0650	GW-112700-WP-0693	
GW-111600-WP-0608	GW-111800-WP-0651	GW-112700-WP-0694	
GW-111600-WP-0609	GW-111800-WP-0652	GW-112700-WP-0695	
GW-111600-WP-0610	GW-111800-WP-0653	GW-112700-WP-0696	
GW-111600-WP-0611	GW-111800-WP-0654	GW-112700-WP-0697	
GW-111600-WP-0612	GW-111800-WP-0655	GW-112700-WP-0698	
GW-111600-WP-0613	GW-111800-WP-0656	GW-121800-WP-0699	
GW-111600-WP-0614	GW-111800-WP-0657	GW-121800-WP-0700	
GW-111600-WP-0615	GW-111800-WP-0658	GW-121800-WP-0701	
GW-111600-WP-0616	GW-111800-WP-0659	GW-121800-WP-0702	

TABLE 2

SUMMARY OF ANALYTICAL METHODS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Parameter	*Analytical Method*[1]
Total Phenolics	EPA 420.2
Arsenic	SW-846 6010B
Ammonia	EPA 350.1
Bromide	EPA 300.0
Volatile Organic Compounds (VOCs)	SW-846 8260B
Semivolatile Organic Compounds (SVOCs)	SW-846 8270C
Nitrate	EPA 300.0
Chemical Oxygen Demand (COD)	EPA 410.4
Total Cyanide	EPA 335.4
Thiocyanate	SM 4500-CN M
Alkalinity	EPA 310.2
Total Suspended Solids (TSS)	EPA 160.2

[1] Methods were referenced from:
EPA - "Methods for Chemical Analysis of Water and Wastes", EPA 600/4-79-040, March 1983.
SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", EPA SW-846, 3rd Edition with Updates I through III, November 1986.
SM - "Standard Methods for the Examination of Water and Wastewater", APHA, 19th Edition, 1995.

TABLE 3

HOLDING TIME PERIODS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN , ILLINOIS

Parameter	*Holding Time Period*
Total Phenolics, Bromide, Ammonia, COD	- 28 days from sample collection to completion of analysis
VOCs, Total Cyanide, Alkalinity	- 14 days from sample collection to completion of analysis
SVOCs	- 7 days from sample collection to extraction - 40 days from extraction to completion of analysis
TSS	- 7 days from sample collection to completion of analysis
Arsenic	- 180 days from sample collection to completion of analysis
Nitrate	- 48 hours from sample collection to completion of analysis
Thiocyanate	- none established

TABLE 4

SUMMARY OF QUALIFIED DATA RESULTING FROM VIOLATION OF REQUIRED HOLDING TIME PERIODS WAUKEGAN MANUFACTURED GAS AND COKE PLANT WAUKEGAN, ILLINOIS

Sample ID	*Analyte*	*Qualifier*[1]
GW-101800-WP-155	Ammonia	J/UJ
GW-101800-WP-156	Ammonia	J/UJ
GW-101800-WP-157	Ammonia	J/UJ
GW-101800-WP-158	Ammonia	J/UJ
GW-101800-WP-159	Ammonia	J/UJ
GW-101900-WP-179	Benzene	J
GW-102000-WP-188	Ammonia	J
GW-102000-WP-189	Ammonia	J
GW-102800-WP-318	Bromide	J/UJ
GW-102800-WP-320	Bromide	J/UJ
GW-102900-WP-325	Bromide	J/UJ
GW-102900-WP-326	Bromide	J/UJ
GW-110200-WP-403	Ammonia	J
	Total Phenolics	J
GW-110200-WP-408	Ammonia	J
	Total Phenolics	J
GW-110300-WP-427	Bromide	J
GW-110600-WP-0474	Benzene	J/UJ
	Toluene	J/UJ
	Ethylbenzene	J/UJ
	Total Xylenes	J/UJ
	Chlorobenzene	J/UJ

TABLE 4

SUMMARY OF QUALIFIED DATA RESULTING FROM VIOLATION OF REQUIRED HOLDING TIME PERIODS WAUKEGAN MANUFACTURED GAS AND COKE PLANT WAUKEGAN, ILLINOIS

Sample ID	*Analyte*	*Qualifier*[1]
GW-110600-WP-0475	Benzene	J/UJ
	Toluene	J/UJ
	Ethylbenzene	J/UJ
	Total Xylenes	J/UJ
	Chlorobenzene	J/UJ
GW-111700-WP-0632	Bromide	J
GW-111700-WP-0633	Bromide	J
GW-111700-WP-0634	Bromide	J
GW-112000-WP-0667	SVOCs	J/UJ
GW-112700-WP-0691	Total Cyanide	J
GW-112700-WP-0692	Total Cyanide	J
GW-112700-WP-0693	Total Cyanide	J
GW-112700-WP-0694	Total Cyanide	J
GW-112700-WP-0695	Total Cyanide	J
GW-112700-WP-0696	Total Cyanide	J
GW-112700-WP-0697	Total Cyanide	J
GW-112700-WP-0698	Total Cyanide	J

[1] The sample results should be qualified as:

J - The associated numerical value is the approximate concentration of the analyte in the sample.

UJ - *The analyte was not detected above the reported sample quantitation limit. However, the* reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 5

SUMMARY OF QUALIFIED DATA RESULTING FROM VIOLATION OF LCS/DUPLICATE LCS PERCENT RECOVERY ACCEPTANCE CRITERIA WAUKEGAN MANUFACTURED GAS AND COKE PLANT WAUKEGAN, ILLINOIS

Sample ID	*Analyte*	*Qualifier*[1]
GW-100700-WP-020	Acenaphthene	UJ
GW-100800-WP-021	Acenaphthene	UJ
GW-100800-WP-022	Acenaphthene	UJ
GW-100800-WP-023	Acenaphthene	UJ
GW-100800-WP-024	Acenaphthene	UJ
GW-100800-WP-025	Acenaphthene	UJ
GW-100800-WP-026	Acenaphthene	UJ
GW-100800-WP-027	Acenaphthene	UJ
GW-100800-WP-028	Acenaphthene	UJ
GW-100800-WP-029	Acenaphthene	UJ
GW-100800-WP-030	Acenaphthene	UJ
GW-100800-WP-031	Acenaphthene	UJ
GW-101100-WP-065	Acenaphthene	UJ
GW-101100-WP-066	Acenaphthene	UJ
GW-101100-WP-067	Acenaphthene	UJ
GW-101100-WP-068	Acenaphthene	UJ

TABLE 5

SUMMARY OF QUALIFIED DATA RESULTING FROM VIOLATION OF LCS/DUPLICATE LCS PERCENT RECOVERY ACCEPTANCE CRITERIA WAUKEGAN MANUFACTURED GAS AND COKE PLANT WAUKEGAN, ILLINOIS

Sample ID	*Analyte*	*Qualifier*[1]
GW-101100-WP-069	Acenaphthene	UJ
GW-101100-WP-070	Acenaphthene	UJ
GW-101100-WP-071	Acenaphthene	UJ
GW-101100-WP-072	Acenaphthene	UJ
GW-101400-WP-114	Total Phenolics	J
GW-101400-WP-115	Total Phenolics	J
GW-101500-WP-116	Total Phenolics	J
GW-101500-WP-117	Total Phenolics	J
GW-101500-WP-118	Total Phenolics	J
GW-101500-WP-119	Total Phenolics	J
GW-101500-WP-120	Total Phenolics	J
GW-101500-WP-121	Total Phenolics	J
GW-101500-WP-122	Total Phenolics	J
GW-101500-WP-123	Total Phenolics	J
GW-101500-WP-124	Total Phenolics	J
GW-101500-WP-125	Total Phenolics	J

TABLE 5

SUMMARY OF QUALIFIED DATA RESULTING FROM VIOLATION OF LCS/DUPLICATE LCS PERCENT RECOVERY ACCEPTANCE CRITERIA WAUKEGAN MANUFACTURED GAS AND COKE PLANT WAUKEGAN, ILLINOIS

Sample ID	*Analyte*	*Qualifier*[1]
GW-101500-WP-128	Total Phenolics	J
GW-101500-WP-129	Total Phenolics	J
GW-101600-WP-131	Total Phenolics	J
GW-101600-WP-132	Total Phenolics	J
GW-101600-WP-133	Total Phenolics	J
GW-101600-WP-134	Total Phenolics	J
GW-101600-WP-135	Total Phenolics	J
GW-101600-WP-136	Total Phenolics	J
GW-101600-WP-137	Total Phenolics	J
GW-101600-WP-138	Total Phenolics	J
GW-101600-WP-139	Total Phenolics	J
GW-101600-WP-140	Total Phenolics	J
GW-101600-WP-141	Total Phenolics	J

1 The sample results should be qualified as:

J - The associated numerical value is the approximate concentration of the analyte in the sample.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6

SUMMARY OF QUALIFIED DATA RESULTING FROM VIOLATION OF MS/MSD PERCENT RECOVERY ACCEPTANCE CRITERIA WAUKEGAN MANUFACTURED GAS AND COKE PLANT WAUKEGAN, ILLINOIS

Sample ID	*Analyte*	*Qualifier*[1]
GW-100500-WP-015	cis-1,3-Dichloropropene	UJ
GW-100700-WP-020	Total Cyanide	J
GW-100800-WP-021	Total Cyanide	J
GW-100800-WP-022	Total Cyanide	UJ
GW-100800-WP-023	Total Cyanide	J
GW-100800-WP-024	Total Cyanide	J
GW-100800-WP-025	Total Cyanide	J
GW-100800-WP-026	Total Cyanide	J
GW-100800-WP-027	Total Cyanide	J
GW-100800-WP-028	Total Cyanide	J
GW-100800-WP-029	Total Cyanide	J
GW-100800-WP-030	Total Cyanide	J
GW-100800-WP-031	Total Cyanide	J
GW-101800-WP-160	Total Cyanide	UJ
GW-101800-WP-161	Total Cyanide	J

TABLE 6

SUMMARY OF QUALIFIED DATA RESULTING FROM VIOLATION OF MS/MSD PERCENT RECOVERY ACCEPTANCE CRITERIA WAUKEGAN MANUFACTURED GAS AND COKE PLANT WAUKEGAN, ILLINOIS

Sample ID	*Analyte*	*Qualifier*[1]
GW-101800-WP-162	Total Cyanide	J
GW-101800-WP-163	Total Cyanide	J
GW-101800-WP-164	Total Cyanide	J
GW-121800-WP-0709	trans-1,3-Dichloropropene	UJ

[1] The sample results should be qualified as:

J - The associated numerical value is the approximate concentration of the analyte in the sample.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 7

SUMMARY OF QUALIFIED DATA RESULTING FROM VIOLATION OF LABORATORY DUPLICATE ANALYSES ACCEPTANCE CRITERIA WAUKEGAN MANUFACTURED GAS AND COKE PLANT WAUKEGAN, ILLINOIS

Sample ID	*Analyte*	*Qualifier*[1]
GW-101800-WP-155	Ammonia	J
GW-101800-WP-156	Ammonia	J
GW-101800-WP-157	Ammonia	J
GW-101800-WP-158	Ammonia	J
GW-101800-WP-159	Ammonia	J
GW-101800-WP-160	Ammonia	J
	Total Cyanide	UJ
GW-101800-WP-161	Ammonia	J
	Total Cyanide	J
GW-101800-WP-162	Ammonia	J
	Total Cyanide	J
GW-101800-WP-163	Ammonia	J
	Total Cyanide	J
GW-101800-WP-164	Ammonia	J
	Total Cyanide	J
GW-102100-WP-196	Total Cyanide	J
GW-102100-WP-199	Total Cyanide	J
GW-102100-WP-201	Total Cyanide	J

TABLE 7

SUMMARY OF QUALIFIED DATA RESULTING FROM VIOLATION OF LABORATORY DUPLICATE ANALYSES ACCEPTANCE CRITERIA WAUKEGAN MANUFACTURED GAS AND COKE PLANT WAUKEGAN, ILLINOIS

Sample ID	*Analyte*	*Qualifier*[1]
GW-102100-WP-202	Total Cyanide	J
GW-102100-WP-203	Total Cyanide	J

[1] The sample results should be qualified as:

J - The associated numerical value is the approximate concentration of the analyte in the sample.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 8

SUMMARY OF DETECTED ANALYTES FROM FIELD DUPLICATE SAMPLE SETS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Analyte	*Investigative Sample* GW-100200-WP-001	*Duplicate Sample* GW-100200-WP-002	*RPD*[1]
Arsenic	12000 µg/L	12000 µg/L	0
Total Cyanide	0.86 mg/L	0.92 mg/L	6.7
Total Phenolics	6800 mg/L	1700 mg/L	120
Thiocyanate	520 mg/L	460 mg/L	12
2-Methylphenol	110000 µg/L	77000 µg/L	35
4-Methylphenol	330000 µg/L	240000 µg/L	32
Naphthalene	630 µg/L	ND[2](50000 µg/L)	NC[3]
Phenol	510000 µg/L	360000 µg/L	34
2-Butanone	73 µg/L	72 µg/L	1.4
Acetone	490 µg/L	480 µg/L	2.1
Benzene	960 µg/L	960 µg/L	0
Styrene	27 µg/L	27 µg/L	0
Toluene	300 µg/L	310 µg/L	3.3
Total Xylenes	130 µg/L	130 µg/L	0

Analyte	*Investigative Sample* GW-100800-WP-026	*Duplicate Sample* GW-100800-WP-027	*RPD*
Arsenic	530 µg/L	520 µg/L	1.9
Tota! Cyanide	0.066 mg/L	0.042 mg/L	40
Ammonia	28 mg/L	24 mg/L	15
Total Phenolics	3.9 mg/L	3.7 mg/L	5.3
2,4-Dimethylphenol	230 µg/L	290 µg/L	23
2-Methylphenol	720 µg/L	980 µg/L	31
4-Methylphenol	880 µg/L	1400 µg/L	46
Phenol	610 µg/L	1400 µg/L	79
Benzene	15 µg/L	15 µg/L	0
Toluene	4.7 µg/L	4.7 µg/L	0
Total Xylenes	4.1 µg/L	4.0 µg/L	2.5
bis (2-Chloroethyl) ether	ND (100 µg/L)	300 µg/L	NC

TABLE 8

SUMMARY OF DETECTED ANALYTES FROM FIELD DUPLICATE SAMPLE SETS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Analyte	*Investigative Sample GW-112700-WP-0686*	*Duplicate Sample GW-112700-WP-0687*	*RPD*
Arsenic	37000 µg/L	19000 µg/L	64
Ammonia	2100 mg/L	2600 mg/L	21
Total Phenolics	1500 mg/L	1200 mg/L	22
Thiocyanate	6900 mg/L	6000 mg/L	14
2,4-Dimethylphenol	27000 µg/L	34000 µg/L	23
2-Methylphenol	92000 µg/L	100000 µg/L	8.3
4-Methylphenol	330000 µg/L	330000 µg/L	0
Phenol	430000 µg/L	540000 µg/L	23
2-Butanone	110 µg/L	110 µg/L	0
Acetone	770 µg/L	770 µg/L	0
Benzene	1100 µg/L	1100 µg/L	0
Styrene	40 µg/L	40 µg/L	0
Toluene	380 µg/L	380 µg/L	0
Total Xylenes	180 µg/L	180 µg/L	0

Analyte	*Investigative Sample GW-112700-WP-0692*	*Duplicate Sample GW-112700-WP-0693*	*RPD*
Arsenic	10,000 µg/L	9800 µg/L	2.0
Total Cyanide	0.31 mg/L	0.52 mg/L	51
Ammonia	970 mg/L	1000 mg/L	3.0
Total Phenolics	590 mg/L	600 mg/L	1.7
Thiocyanate	4600 mg/L	2900 mg/L	45
2-Methylphenol	46000 µg/L	ND (40000 µg/L)	NC
4-Methylphenol	140000 µg/L	140000 µg/L	0
Phenol	210000 µg/L	200000 µg/L	4.9
2-Butanone	46 µg/L	40 µg/L	14
Acetone	310 µg/L	200 µg/L	43
Benzene	500 µg/L	480 µg/L	4.1
Styrene	20 µg/L	20 µg/L	0
Toluene	150 µg/L	150 µg/L	0
Total Xylenes	62 µg/L	61 µg/L	1.6

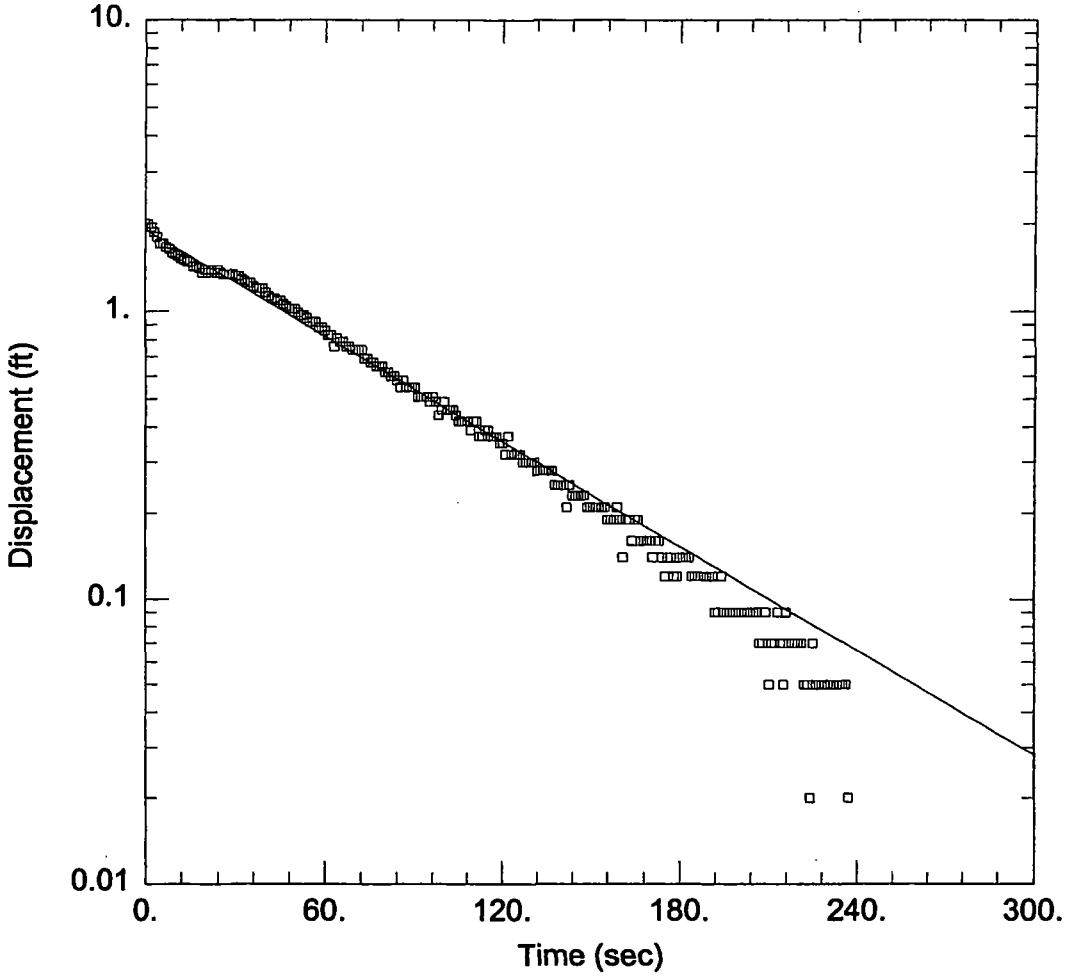
[1] RPD - Relative Percent Difference

[2] ND ( ) - Not detected at the associated value

[3] NC - Not Calculable

APPENDIX E

RESPONSE TEST SUMMARY TABLES, GRAPHS AND WELL LOGS



RESPONSE TEST DATA MW-4D TEST 1

Data Set: U:\MY_DOC~1\15670WCS\MW-4DT1.AQT
Date: 03/06/01 Time: 15:01:15

PROJECT INFORMATION

Company: Conestoga-Rovers & Associates
Client: WCP Group
Project: 15670
Test Location: Waukegan, Illinois
Test Well: MW-4D
Test Date: July 11, 2000

AQUIFER DATA

Saturated Thickness: 29.34 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2. ft
Casing Radius: 0.083 ft
Screen Length: 5. ft
Water Column Height: 29.34 ft
Wellbore Radius: 0.41 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0007933 cm/sec
y0 = 1.914 ft

RESPONSE TEST DATA
MW-4D TEST 1

TIME (seconds)	CHANGE IN HEAD (feet)
1	1.99
2	1.94
3	1.87
4	1.8
5	1.71
6	1.71
7	1.66
8	1.64
9	1.59
10	1.57
11	1.55
12	1.52
13	1.5
14	1.48
15	1.48
16	1.43
17	1.43
18	1.41
19	1.36
20	1.39
21	1.36
22	1.39
23	1.36
24	1.39
25	1.36
26	1.34
27	1.34
28	1.34
29	1.34
30	1.32
31	1.32
32	1.29
33	1.27
34	1.25
35	1.25
36	1.22
37	1.2
38	1.2
39	1.2
40	1.16
41	1.13
42	1.11
43	1.11
44	1.09
45	1.09
46	1.06

RESPONSE TEST DATA
MW-4D TEST 1

TIME (seconds)	CHANGE IN HEAD (feet)
47	1.04
48	1.02
49	1.02
50	1.02
51	0.99
52	0.97
53	0.97
54	0.95
55	0.92
56	0.92
57	0.92
58	0.88
59	0.88
60	0.86
61	0.83
62	0.83
63	0.76
64	0.81
65	0.79
66	0.79
67	0.76
68	0.76
69	0.74
70	0.74
71	0.74
72	0.74
73	0.69
74	0.69
75	0.67
76	0.67
77	0.65
78	0.65
79	0.65
80	0.62
81	0.62
82	0.6
83	0.6
84	0.58
85	0.55
86	0.58
87	0.55
88	0.55
89	0.55
90	0.55
91	0.51
92	0.51
93	0.51

RESPONSE TEST DATA
MW-4D TEST 1

TIME (seconds)	CHANGE IN HEAD (feet)
94	0.51
95	0.49
96	0.51
97	0.49
98	0.44
99	0.46
100	0.49
101	0.46
102	0.46
103	0.46
104	0.44
105	0.42
106	0.42
107	0.42
108	0.42
109	0.39
110	0.42
111	0.42
112	0.37
113	0.37
114	0.39
115	0.39
116	0.37
117	0.37
118	0.37
119	0.35
120	0.35
121	0.32
122	0.37
123	0.32
124	0.32
125	0.32
126	0.32
127	0.3
128	0.3
129	0.3
130	0.3
131	0.3
132	0.28
133	0.28
134	0.28
135	0.28
136	0.28
137	0.28
138	0.25
139	0.25
140	0.25

RESPONSE TEST DATA
MW-4D TEST 1

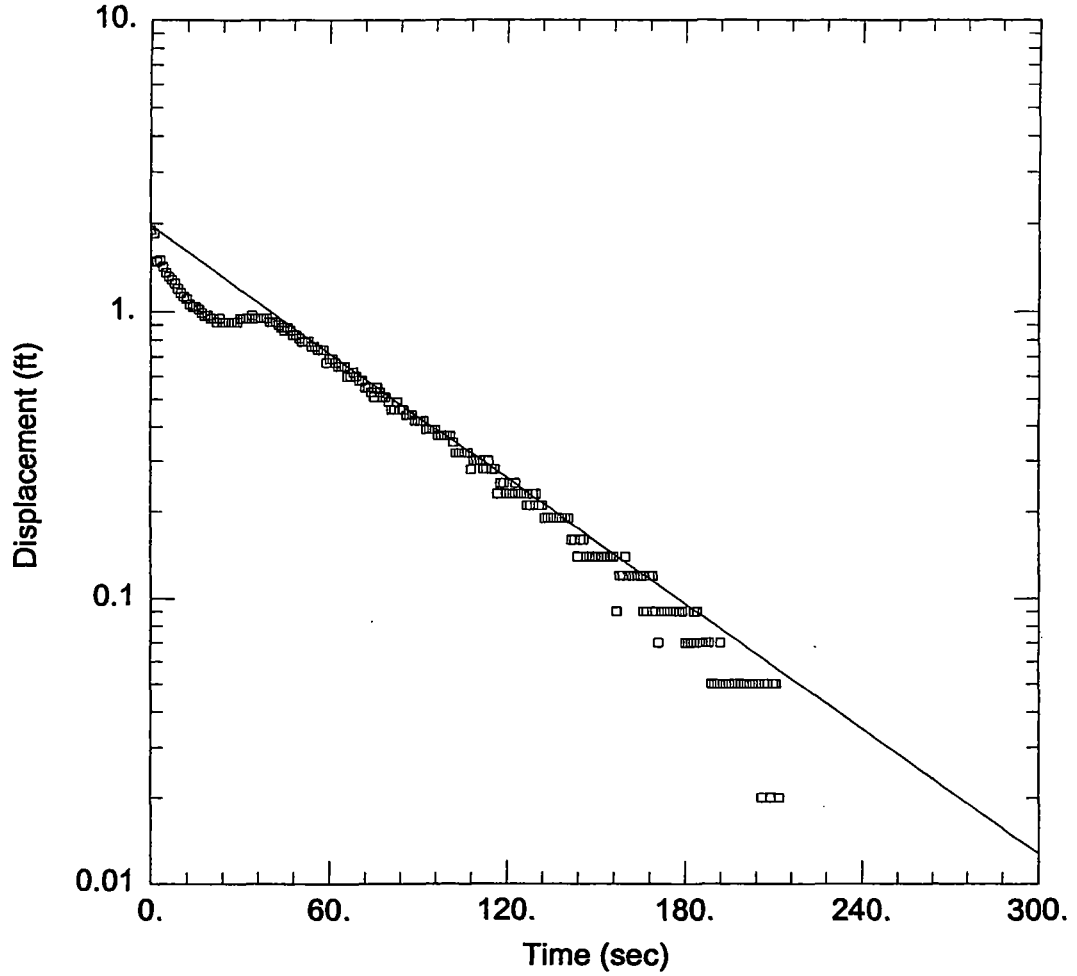
TIME (seconds)	CHANGE IN HEAD (feet)
141	0.25
142	0.21
143	0.25
144	0.23
145	0.23
146	0.23
147	0.23
148	0.23
149	0.21
150	0.21
151	0.21
152	0.21
153	0.21
154	0.21
155	0.21
156	0.19
157	0.19
158	0.19
159	0.21
160	0.19
161	0.14
162	0.19
163	0.19
164	0.16
165	0.19
166	0.19
167	0.16
168	0.16
169	0.16
170	0.16
171	0.14
172	0.16
173	0.16
174	0.14
175	0.12
176	0.14
177	0.14
178	0.12
179	0.12
180	0.14
181	0.14
182	0.14
183	0.14
184	0.12
185	0.12
186	0.12
187	0.12

RESPONSE TEST DATA
MW-4D TEST 1

TIME (seconds)	CHANGE IN HEAD (feet)
188	0.12
189	0.12
190	0.12
191	0.12
192	0.09
193	0.09
194	0.12
195	0.09
196	0.09
197	0.09
198	0.09
199	0.09
200	0.09
201	0.09
202	0.09
203	0.09
204	0.09
205	0.09
206	0.09
207	0.07
208	0.07
209	0.09
210	0.05
211	0.07
212	0.07
213	0.09
214	0.07
215	0.05
216	0.09
217	0.07
218	0.07
219	0.07
220	0.07
221	0.07
222	0.05
223	0.05
224	0.02
225	0.07
226	0.05
227	0.05
228	0.05
229	0.05
230	0.05
231	0.05
232	0.05
233	0.05
234	0.05

RESPONSE TEST DATA
MW-4D TEST 1

TIME (seconds)	CHANGE IN HEAD (feet)
235	0.05
236	0.05
237	0.02



RESPONSE TEST DATA MW-4D TEST 2

Data Set: U:\MY_DOC~1\15670WCS\MW-4DT2.AQT
Date: 03/06/01 Time: 15:01:31

PROJECT INFORMATION

Company: Conestoga-Rovers & Associates
Client: WCP Group
Project: 15670
Test Location: Waukegan, Illinois
Test Well: MW-4D
Test Date: July 11, 2000

AQUIFER DATA

Saturated Thickness: 29.34 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 1.9 ft Water Column Height: 29.34 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.41 ft
Screen Length: 5. ft

SOLUTION

Aquifer Model: Unconfined K = 0.0009496 cm/sec
Solution Method: Bouwer-Rice y0 = 1.975 ft

RESPONSE TEST DATA
MW-4D TEST 2

TIME (seconds)	CHANGE IN HEAD (feet)
1	1.85
2	1.48
3	1.5
4	1.43
5	1.36
6	1.32
7	1.29
8	1.25
9	1.2
10	1.16
11	1.13
12	1.11
13	1.06
14	1.04
15	1.04
16	1.02
17	0.99
18	0.97
19	0.97
20	0.95
21	0.95
22	0.92
23	0.95
24	0.92
25	0.92
26	0.92
27	0.92
28	0.92
29	0.92
30	0.95
31	0.95
32	0.95
33	0.95
34	0.97
35	0.95
36	0.95
37	0.95
38	0.95
39	0.95
40	0.92
41	0.92
42	0.92
43	0.9
44	0.88
45	0.86

RESPONSE TEST DATA
MW-4D TEST 2

TIME (seconds)	CHANGE IN HEAD (feet)
46	0.88
47	0.86
48	0.83
49	0.83
50	0.81
51	0.79
52	0.79
53	0.79
54	0.76
55	0.76
56	0.74
57	0.74
58	0.74
59	0.67
60	0.69
61	0.69
62	0.67
63	0.65
64	0.65
65	0.65
66	0.6
67	0.6
68	0.62
69	0.6
70	0.58
71	0.58
72	0.55
73	0.55
74	0.53
75	0.51
76	0.55
77	0.53
78	0.51
79	0.51
80	0.49
81	0.46
82	0.46
83	0.49
84	0.46
85	0.46
86	0.44
87	0.44
88	0.44
89	0.42
90	0.42
91	0.42
92	0.42

RESPONSE TEST DATA
MW-4D TEST 2

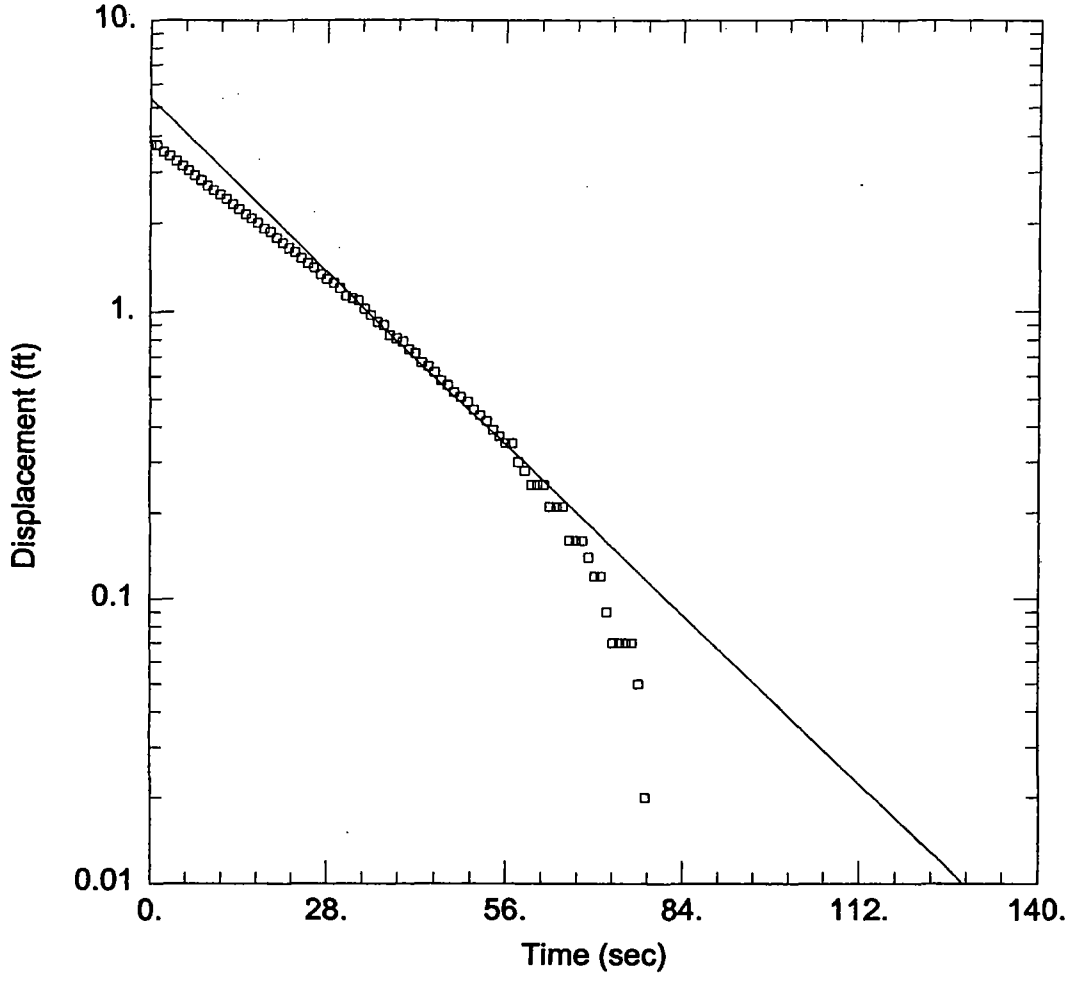
TIME (seconds)	CHANGE IN HEAD (feet)
93	0.39
94	0.39
95	0.39
96	0.39
97	0.37
98	0.37
99	0.37
100	0.37
101	0.37
102	0.35
103	0.32
104	0.32
105	0.32
106	0.32
107	0.32
108	0.28
109	0.3
110	0.3
111	0.3
112	0.28
113	0.28
114	0.3
115	0.28
116	0.28
117	0.23
118	0.25
119	0.25
120	0.23
121	0.23
122	0.23
123	0.25
124	0.23
125	0.23
126	0.23
127	0.21
128	0.21
129	0.23
130	0.23
131	0.21
132	0.21
133	0.19
134	0.19
135	0.19
136	0.19
137	0.19
138	0.19
139	0.19

RESPONSE TEST DATA
MW-4D TEST 2

TIME (seconds)	CHANGE IN HEAD (feet)
140	0.19
141	0.19
142	0.16
143	0.16
144	0.14
145	0.16
146	0.16
147	0.14
148	0.14
149	0.14
150	0.14
151	0.14
152	0.14
153	0.14
154	0.14
155	0.14
156	0.14
157	0.09
158	0.12
159	0.12
160	0.14
161	0.12
162	0.12
163	0.12
164	0.12
165	0.12
166	0.09
167	0.09
168	0.12
169	0.12
170	0.09
171	0.07
172	0.09
173	0.09
174	0.09
175	0.09
176	0.09
177	0.09
178	0.09
179	0.09
180	0.07
181	0.07
182	0.07
183	0.09
184	0.09
185	0.07
186	0.07

RESPONSE TEST DATA
MW-4D TEST 2

TIME (seconds)	CHANGE IN HEAD (feet)
187	0.07
188	0.07
189	0.05
190	0.05
191	0.05
192	0.07
193	0.05
194	0.05
195	0.05
196	0.05
197	0.05
198	0.05
199	0.05
200	0.05
201	0.05
202	0.05
203	0.05
204	0.05
205	0.05
206	0.02
207	0.05
208	0.05
209	0.02
210	0.05
211	0.05
212	0.02



RESPONSE TEST DATA MW-7D TEST 1

Data Set: U:\MY_DOC~1\15670WCS\MW-7DT1.AQT
Date: 03/06/01 Time: 15:01:52

PROJECT INFORMATION

Company: Conestoga-Rovers & Associates
Client: WCP Group
Project: 15670
Test Location: Waukegan, Illinois
Test Well: MW-4D
Test Date: July 11, 2000

AQUIFER DATA

Saturated Thickness: 29.8 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 3.75 ft
Water Column Height: 29.8 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.41 ft
Screen Length: 4.7 ft

SOLUTION

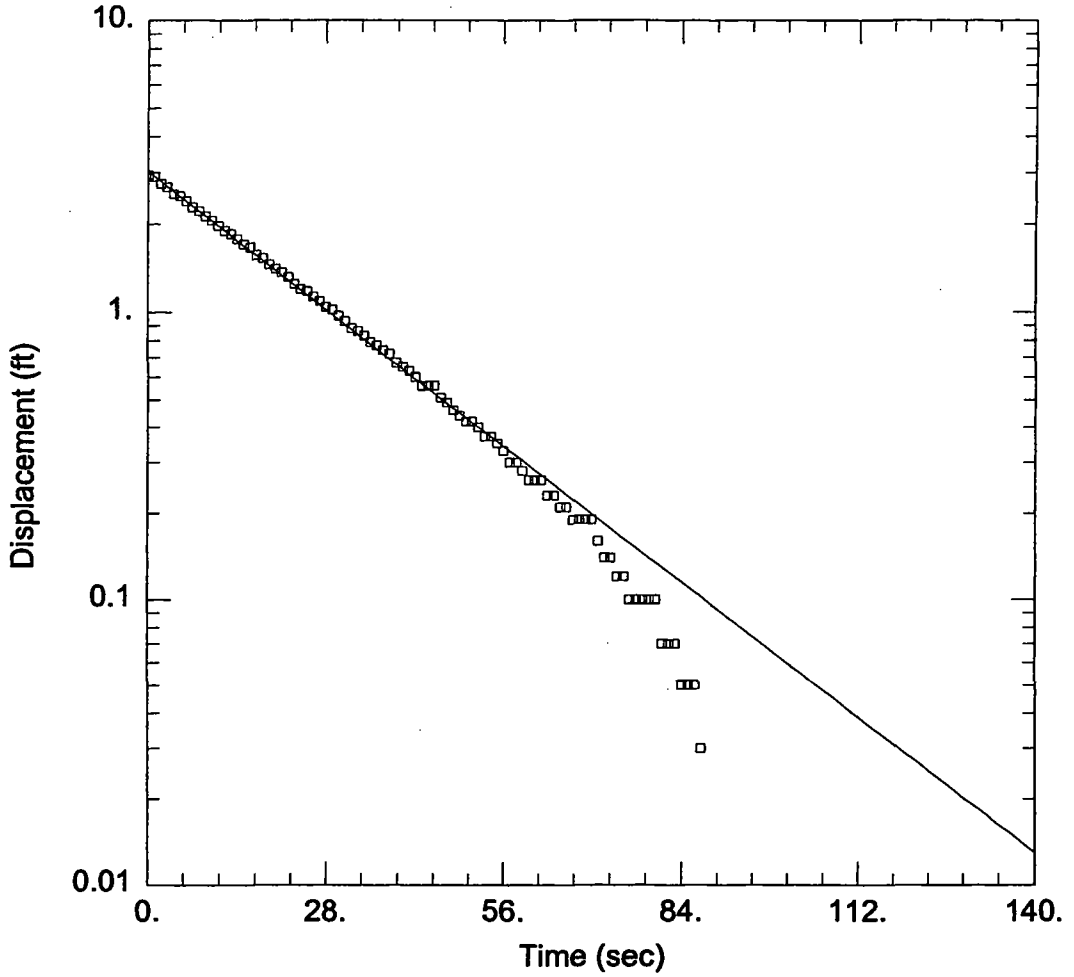
Aquifer Model: Unconfined
K = 0.002922 cm/sec
Solution Method: Bouwer-Rice
y0 = 5.411 ft

RESPONSE TEST DATA
MW-7D TEST 1

TIME (seconds)	CHANGE IN HEAD (feet)
1	3.72
2	3.53
3	3.42
4	3.28
5	3.16
6	3.05
7	2.93
8	2.82
9	2.7
10	2.61
11	2.52
12	2.43
13	2.33
14	2.24
15	2.15
16	2.08
17	2.01
18	1.92
19	1.87
20	1.78
21	1.71
22	1.64
23	1.59
24	1.52
25	1.46
26	1.41
27	1.34
28	1.29
29	1.25
30	1.2
31	1.13
32	1.11
33	1.09
34	1.02
35	0.97
36	0.92
37	0.9
38	0.83
39	0.81
40	0.79
41	0.74
42	0.72
43	0.67
44	0.65
45	0.62

RESPONSE TEST DATA
MW-7D TEST 1

TIME (seconds)	CHANGE IN HEAD (feet)
46	0.58
47	0.56
48	0.53
49	0.51
50	0.49
51	0.46
52	0.44
53	0.42
54	0.39
55	0.37
56	0.35
57	0.35
58	0.3
59	0.28
60	0.25
61	0.25
62	0.25
63	0.21
64	0.21
65	0.21
66	0.16
67	0.16
68	0.16
69	0.14
70	0.12
71	0.12
72	0.09
73	0.07
74	0.07
75	0.07
76	0.07
77	0.05
78	0.02



RESPONSE TEST DATA MW-7D TEST 2

Data Set: U:\MY_DOC~1\15670WCS\MW-7DT2.AQT
Date: 03/06/01 Time: 15:02:07

PROJECT INFORMATION

Company: Conestoga-Rovers & Associates
Client: WCP Group
Project: 15670
Test Location: Waukegan, Illinois
Test Well: MW-4D
Test Date: July 11, 2000

AQUIFER DATA

Saturated Thickness: 29.8 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.95 ft Water Column Height: 29.8 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.41 ft
Screen Length: 4.7 ft

SOLUTION

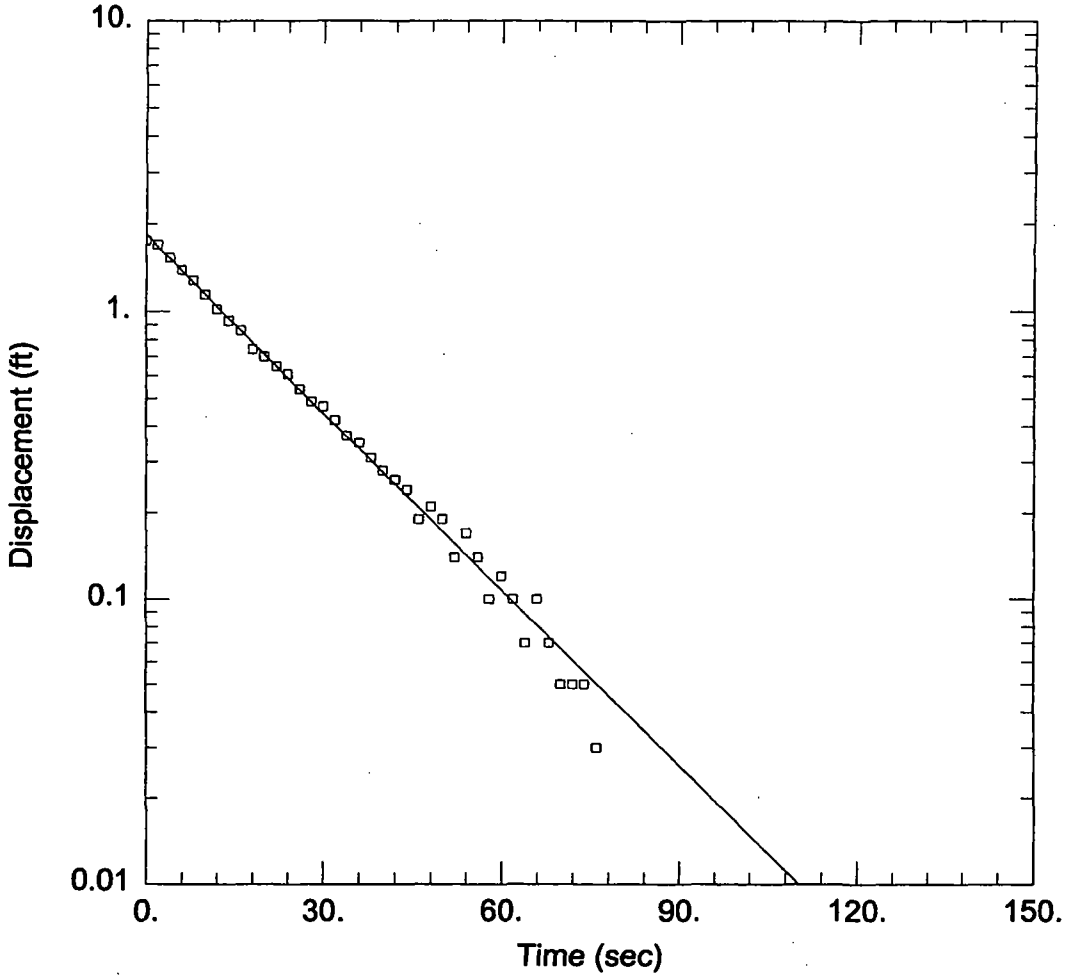
Aquifer Model: Unconfined K = 0.00232 cm/sec
Solution Method: Bouwer-Rice y0 = 3.035 ft

RESPONSE TEST DATA
MW-7D TEST 2

TIME (seconds)	CHANGE IN HEAD (feet)
1	2.91
2	2.75
3	2.68
4	2.54
5	2.5
6	2.4
7	2.29
8	2.22
9	2.13
10	2.06
11	1.97
12	1.9
13	1.85
14	1.78
15	1.71
16	1.67
17	1.57
18	1.53
19	1.46
20	1.41
21	1.37
22	1.32
23	1.25
24	1.2
25	1.18
26	1.13
27	1.09
28	1.04
29	1.02
30	0.97
31	0.93
32	0.88
33	0.86
34	0.83
35	0.79
36	0.77
37	0.74
38	0.72
39	0.67
40	0.65
41	0.63
42	0.6
43	0.56
44	0.56
45	0.56

RESPONSE TEST DATA
MW-7D TEST 2

TIME (seconds)	CHANGE IN HEAD (feet)
46	0.51
47	0.49
48	0.46
49	0.44
50	0.42
51	0.42
52	0.4
53	0.37
54	0.37
55	0.35
56	0.33
57	0.3
58	0.3
59	0.28
60	0.26
61	0.26
62	0.26
63	0.23
64	0.23
65	0.21
66	0.21
67	0.19
68	0.19
69	0.19
70	0.19
71	0.16
72	0.14
73	0.14
74	0.12
75	0.12
76	0.1
77	0.1
78	0.1
79	0.1
80	0.1
81	0.07
82	0.07
83	0.07
84	0.05
85	0.05
86	0.05
87	0.03



RESPONSE TEST DATA MW-8D TEST 1

Data Set: U:\MY_DOC~1\15670WCS\MW-8DT1.AQT
Date: 03/06/01 Time: 15:02:22

PROJECT INFORMATION

Company: Conestoga-Rovers & Associates
Client: WCP Group
Project: 15670
Test Location: Waukegan, Illinois
Test Well: MW-8D
Test Date: July 11, 2000

AQUIFER DATA

Saturated Thickness: 26.38 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

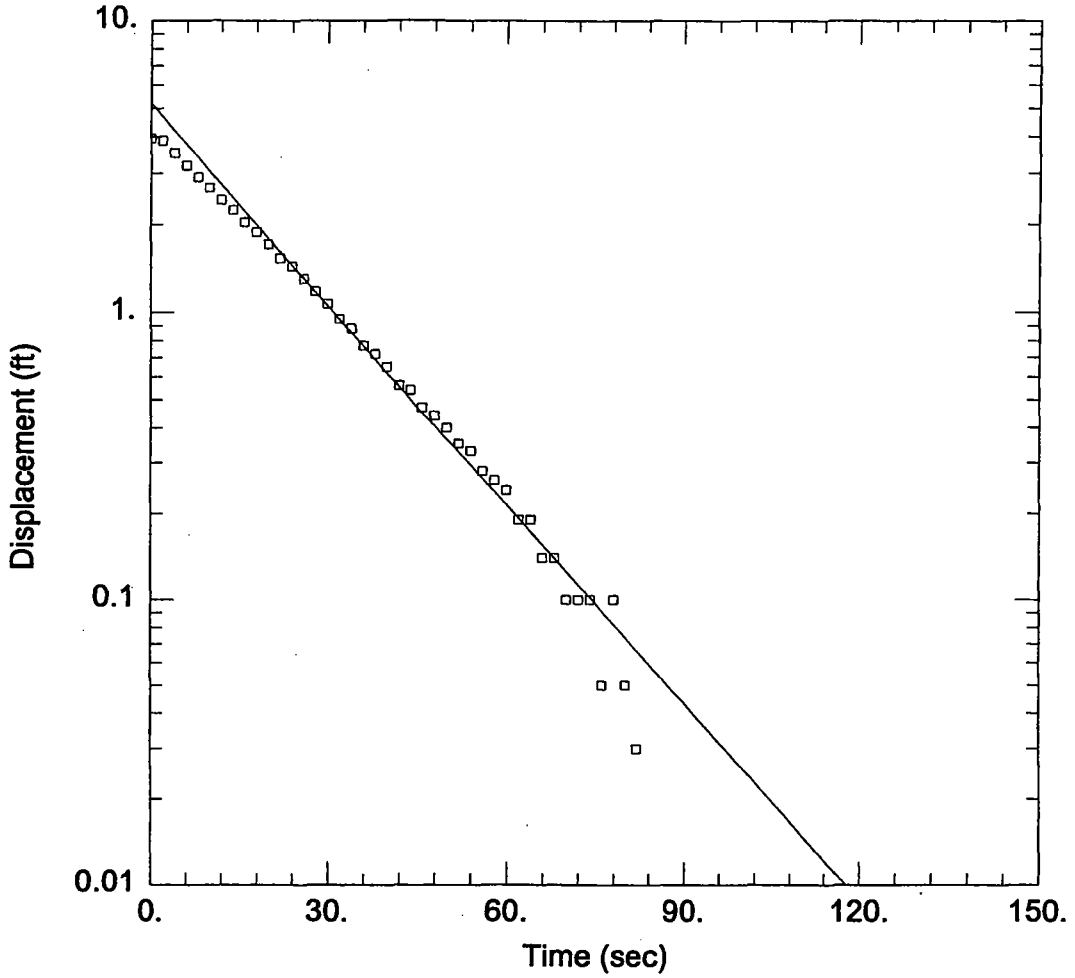
Initial Displacement: 1.75 ft Water Column Height: 26.38 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.41 ft
Screen Length: 5. ft

SOLUTION

Aquifer Model: Unconfined K = 0.002628 cm/sec
Solution Method: Bouwer-Rice y0 = 1.842 ft

RESPONSE TEST DATA
MW-8D TEST 1

TIME (seconds)	CHANGE IN HEAD (feet)
2	1.69
4	1.53
6	1.39
8	1.28
10	1.14
12	1.02
14	0.93
16	0.86
18	0.74
20	0.7
22	0.65
24	0.61
26	0.54
28	0.49
30	0.47
32	0.42
34	0.37
36	0.35
38	0.31
40	0.28
42	0.26
44	0.24
46	0.19
48	0.21
50	0.19
52	0.14
54	0.17
56	0.14
58	0.1
60	0.12
62	0.1
64	0.07
66	0.1
68	0.07
70	0.05
72	0.05
74	0.05
76	0.03



RESPONSE TEST DATA MW-8D TEST 2

Data Set: U:\MY_DOC~1\15670WCS\MW-8DT2.AQT
Date: 03/06/01 Time: 15:02:38

PROJECT INFORMATION

Company: Conestoga-Rovers & Associates
Client: WCP Group
Project: 15670
Test Location: Waukegan, Illinois
Test Well: MW-8D
Test Date: July 11, 2000

AQUIFER DATA

Saturated Thickness: 26.38 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

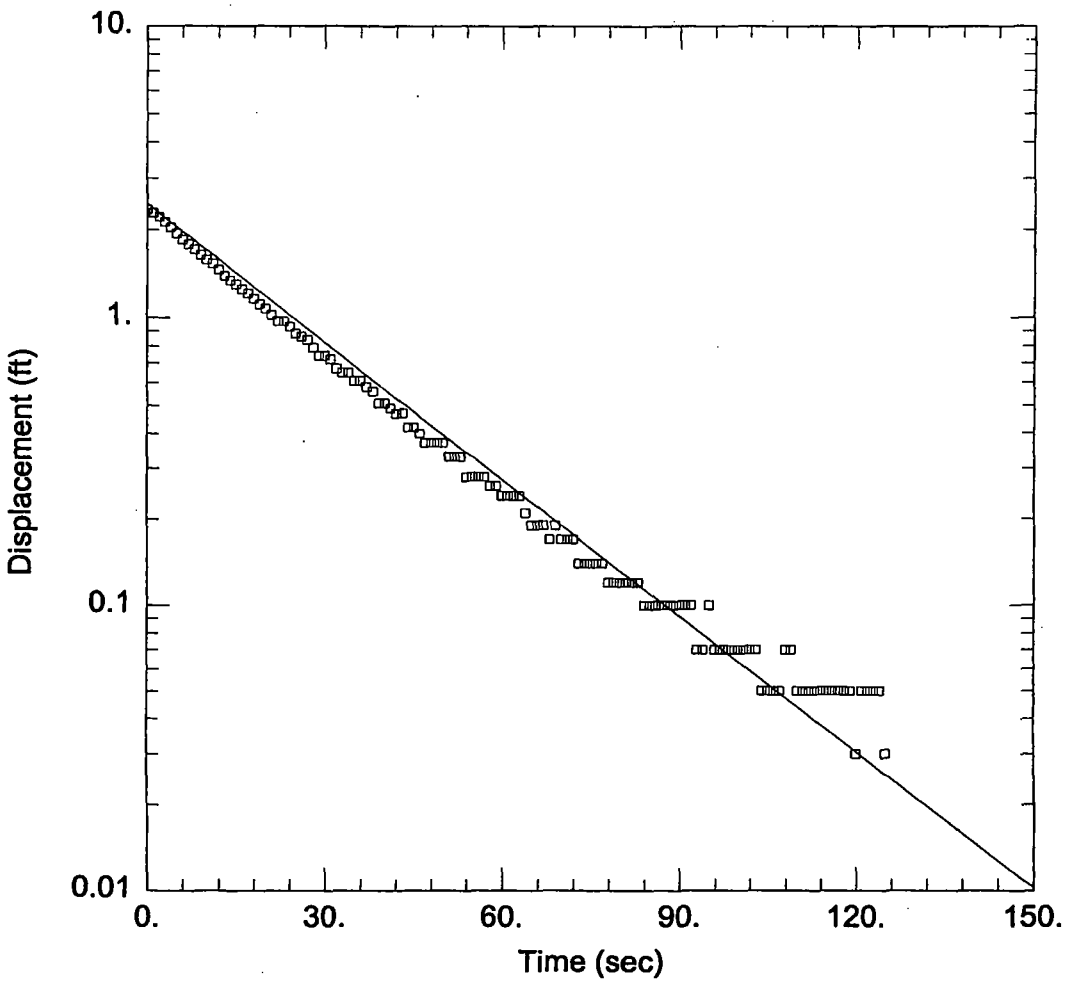
Initial Displacement: 3.95 ft Water Column Height: 26.38 ft
Casing Radius: 0.083 ft Wellbore Radius: 0.41 ft
Screen Length: 5. ft

SOLUTION

Aquifer Model: Unconfined K = 0.002952 cm/sec
Solution Method: Bouwer-Rice y0 = 5.208 ft

RESPONSE TEST DATA
MW-8D TEST 2

TIME (seconds)	CHANGE IN HEAD (feet)
2	3.88
4	3.52
6	3.19
8	2.91
10	2.68
12	2.43
14	2.25
16	2.04
18	1.88
20	1.71
22	1.53
24	1.44
26	1.3
28	1.18
30	1.07
32	0.95
34	0.88
36	0.77
38	0.72
40	0.65
42	0.56
44	0.54
46	0.47
48	0.44
50	0.4
52	0.35
54	0.33
56	0.28
58	0.26
60	0.24
62	0.19
64	0.19
66	0.14
68	0.14
70	0.1
72	0.1
74	0.1
76	0.05
78	0.1
80	0.05
82	0.03



RESPONSE TEST DATA MW-9D TEST 1

Data Set: U:\MY_DOC~1\15670WCS\MW-9DT1.AQT
Date: 03/06/01 Time: 15:02:54

PROJECT INFORMATION

Company: Conestoga-Rovers & Associates
Client: WCP Group
Project: 15670
Test Location: Waukegan, Illinois
Test Well: MW-9D
Test Date: July 11, 2000

AQUIFER DATA

Saturated Thickness: 29. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.35 ft
Water Column Height: 29. ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.41 ft
Screen Length: 4.7 ft

SOLUTION

Aquifer Model: Unconfined
K = 0.002169 cm/sec
Solution Method: Bouwer-Rice
y0 = 2.464 ft

RESPONSE TEST DATA
MW-9D TEST 1

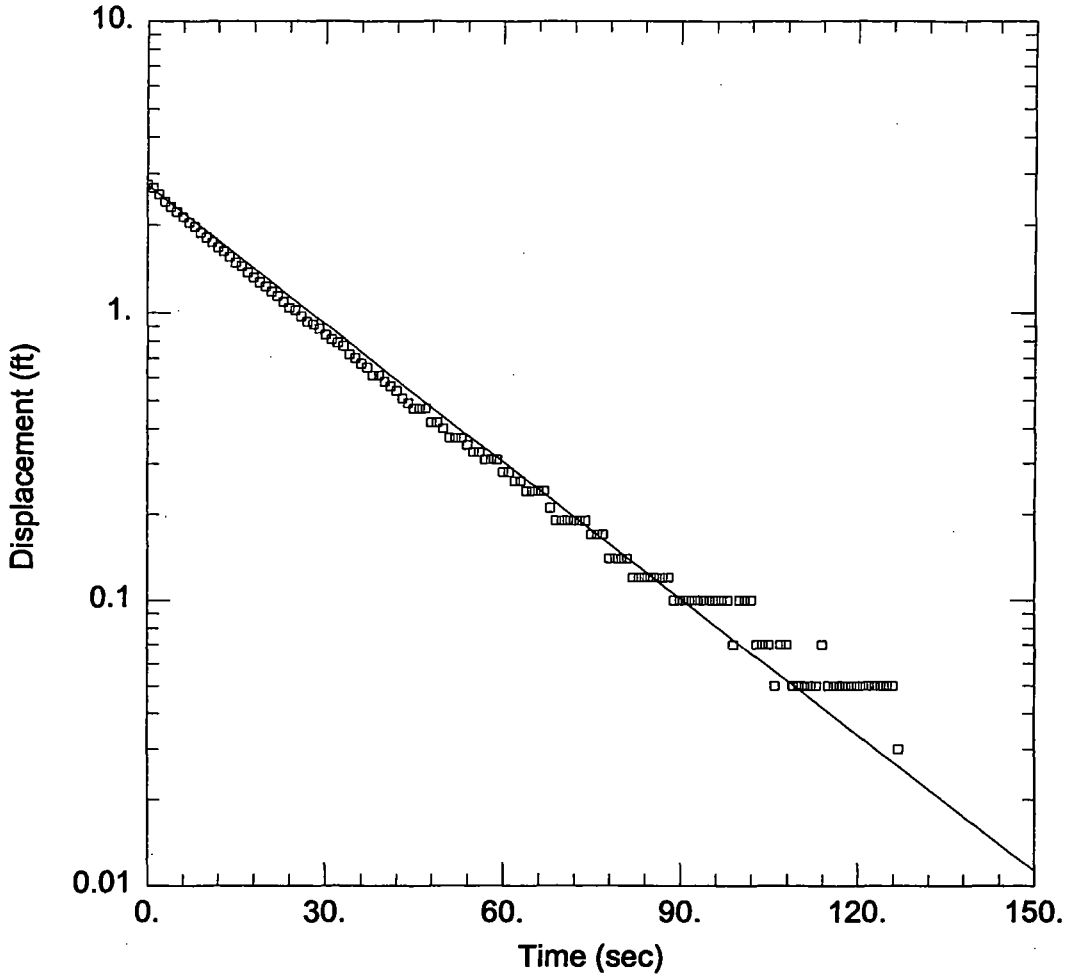
TIME (seconds)	CHANGE IN HEAD (feet)
1	2.29
2	2.22
3	2.13
4	2.04
5	1.94
6	1.85
7	1.78
8	1.71
9	1.64
10	1.58
11	1.53
12	1.46
13	1.39
14	1.34
15	1.3
16	1.25
17	1.21
18	1.16
19	1.11
20	1.07
21	1.02
22	0.97
23	0.97
24	0.93
25	0.88
26	0.86
27	0.84
28	0.79
29	0.74
30	0.74
31	0.72
32	0.67
33	0.65
34	0.65
35	0.61
36	0.61
37	0.58
38	0.56
39	0.51
40	0.51
41	0.49
42	0.47
43	0.47
44	0.42
45	0.42

RESPONSE TEST DATA
MW-9D TEST 1

TIME (seconds)	CHANGE IN HEAD (feet)
46	0.4
47	0.37
48	0.37
49	0.37
50	0.37
51	0.33
52	0.33
53	0.33
54	0.28
55	0.28
56	0.28
57	0.28
58	0.26
59	0.26
60	0.24
61	0.24
62	0.24
63	0.24
64	0.21
65	0.19
66	0.19
67	0.19
68	0.17
69	0.19
70	0.17
71	0.17
72	0.17
73	0.14
74	0.14
75	0.14
76	0.14
77	0.14
78	0.12
79	0.12
80	0.12
81	0.12
82	0.12
83	0.12
84	0.1
85	0.1
86	0.1
87	0.1
88	0.1
89	0.1
90	0.1
91	0.1
92	0.1

RESPONSE TEST DATA
MW-9D TEST 1

TIME (seconds)	CHANGE IN HEAD (feet)
93	0.07
94	0.07
95	0.1
96	0.07
97	0.07
98	0.07
99	0.07
100	0.07
101	0.07
102	0.07
103	0.07
104	0.05
105	0.05
106	0.05
107	0.05
108	0.07
109	0.07
110	0.05
111	0.05
112	0.05
113	0.05
114	0.05
115	0.05
116	0.05
117	0.05
118	0.05
119	0.05
120	0.03
121	0.05
122	0.05
123	0.05
124	0.05
125	0.03



RESPONSE TEST DATA MW-9D TEST 2

Data Set: U:\MY_DOC~1\15670WCS\MW-9DT2.AQT
Date: 03/06/01 Time: 15:03:09

PROJECT INFORMATION

Company: Conestoga-Rovers & Associates
Client: WCP Group
Project: 15670
Test Location: Waukegan, Illinois
Test Well: MW-9D
Test Date: July 11, 2000

AQUIFER DATA

Saturated Thickness: 29. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.75 ft Water Column Height: 29. ft
Casing Radius: 0.083 ft Wellbore Radius: 0.41 ft
Screen Length: 4.7 ft

SOLUTION

Aquifer Model: Unconfined K = 0.002175 cm/sec
Solution Method: Bouwer-Rice y0 = 2.754 ft

RESPONSE TEST DATA
MW-9D TEST 2

TIME (seconds)	CHANGE IN HEAD (feet)
1	2.68
2	2.55
3	2.41
4	2.31
5	2.22
6	2.13
7	2.04
8	1.97
9	1.88
10	1.81
11	1.74
12	1.67
13	1.62
14	1.55
15	1.48
16	1.44
17	1.37
18	1.32
19	1.27
20	1.23
21	1.18
22	1.14
23	1.09
24	1.04
25	1.02
26	0.97
27	0.93
28	0.91
29	0.88
30	0.84
31	0.81
32	0.79
33	0.77
34	0.72
35	0.7
36	0.67
37	0.65
38	0.61
39	0.61
40	0.58
41	0.56
42	0.54
43	0.51
44	0.49
45	0.47

RESPONSE TEST DATA
MW-9D TEST 2

TIME (seconds)	CHANGE IN HEAD (feet)
46	0.47
47	0.47
48	0.42
49	0.42
50	0.4
51	0.37
52	0.37
53	0.37
54	0.35
55	0.33
56	0.33
57	0.31
58	0.31
59	0.31
60	0.28
61	0.28
62	0.26
63	0.26
64	0.24
65	0.24
66	0.24
67	0.24
68	0.21
69	0.19
70	0.19
71	0.19
72	0.19
73	0.19
74	0.19
75	0.17
76	0.17
77	0.17
78	0.14
79	0.14
80	0.14
81	0.14
82	0.12
83	0.12
84	0.12
85	0.12
86	0.12
87	0.12
88	0.12
89	0.1
90	0.1
91	0.1
92	0.1

RESPONSE TEST DATA
MW-9D TEST 2

TIME (seconds)	CHANGE IN HEAD (feet)
93	0.1
94	0.1
95	0.1
96	0.1
97	0.1
98	0.1
99	0.07
100	0.1
101	0.1
102	0.1
103	0.07
104	0.07
105	0.07
106	0.05
107	0.07
108	0.07
109	0.05
110	0.05
111	0.05
112	0.05
113	0.05
114	0.07
115	0.05
116	0.05
117	0.05
118	0.05
119	0.05
120	0.05
121	0.05
122	0.05
123	0.05
124	0.05
125	0.05
126	0.05
127	0.03

APPENDIX F

GROUNDWATER ANALYTICAL RESULTS – E/R UNIT

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-100800-WP-021*	*GW-100900-WP-041*	*GW-101000-WP-050*	*GW-101100-WP-060*	*GW-101200-WP-078*	*GW-101300-WP-088*	*GW-101400-WP-103*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/10/2000*	*10/11/2000*	*10/12/2000*	*10/13/2000*	*10/14/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
1,1,2-Trichloroethane	ug/L	ND(1 0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
1,1-Dichloroethane	ug/L	ND(1 0)	-	ND(1.0)	-	ND(1 0)	-	ND(10)
1,1-Dichloroethene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
1,2-Dichloroethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
1,2-Dichloropropane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
2-Butanone	ug/L	ND(5.0)	-	ND(5.0)	-	ND(5.0)	-	ND(50)
2-Hexanone	ug/L	ND(5.0)	-	ND(5.0)	-	ND(5.0)	-	ND(50)
4-Methyl-2-pentanone	ug/L	ND(5.0)	-	ND(5.0)	-	ND(5.0)	-	ND(50)
Acetone	ug/L	11	-	8.2	-	5 6	-	ND(50)
Benzene	ug/L	53	-	41	-	38	-	29
Bromodichloromethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Bromoform	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Bromomethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Carbon disulfide	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Carbon tetrachloride	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Chlorobenzene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Chlorobromomethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Chloroethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Chloroform	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Chloromethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
cis-1,2-Dichloroethene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
cis-1,3-Dichloropropene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Methylene chloride	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Styrene	ug/L	1.5	-	ND(1.0)	-	1.3	-	ND(10)
Tetrachloroethene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Toluene	ug/L	16	-	14	-	12	-	10
trans-1,2-Dichloroethene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
trans-1,3-Dichloropropene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Trichloroethene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Vinyl chloride	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(10)
Xylene (total)	ug/L	8.6	-	7.5	-	6.5	-	ND(20)
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
1,2-Dichlorobenzene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
1,3-Dichlorobenzene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
1,4-Dichlorobenzene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
2,4,5-Trichlorophenol	ug/L	ND(1300)	-	ND(1300)	-	ND(1300)	-	ND(1300)
2,4,6-Trichlorophenol	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
2,4-Dichlorophenol	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
2,4-Dimethylphenol	ug/L	720	-	610	-	510	-	ND(500)
2,4-Dinitrophenol	ug/L	ND(1300)	-	ND(1300)	-	ND(1300)	-	ND(1300)
2,4-Dinitrotoluene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
2,6-Dinitrotoluene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
2-Chloronaphthalene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
2-Chlorophenol	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)

TABLE F.1

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-100800-WP-021*	*GW-100900-WP-041*	*GW-101000-WP-050*	*GW-101100-WP-060*	*GW-101200-WP-078*	*GW-101300-WP-088*	*GW-101400-WP-103*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/10/2000*	*10/11/2000*	*10/12/2000*	*10/13/2000*	*10/14/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
2-Methylphenol	ug/L	2000	-	1700	-	1200	-	1200
2-Nitroaniline	ug/L	ND(1300)	-	ND(1300)	-	ND(1300)	-	ND(1300)
2-Nitrophenol	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
3,3'-Dichlorobenzidine	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
3-Nitroaniline	ug/L	ND(1300)	-	ND(1300)	-	ND(1300)	-	ND(1300)
4,6-Dinitro-2-methylphenol	ug/L	ND(1300)	-	ND(1300)	-	ND(1300)	-	ND(1300)
4-Bromophenyl phenyl ether	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
4-Chloro-3-methylphenol	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
4-Chloroaniline	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
4-Chlorophenyl phenyl ether	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
4-Methylphenol	ug/L	3300	-	3200	-	2400	-	2400
4-Nitroaniline	ug/L	ND(1300)	-	ND(1300)	-	ND(1300)	-	ND(1300)
4-Nitrophenol	ug/L	ND(1300)	-	ND(1300)	-	ND(1300)	-	ND(1300)
Acenaphthene	ug/L	ND(500) UJ	-	ND(500)	-	ND(500)	-	ND(500)
Acenaphthylene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Anthracene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Benzo(a)anthracene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Benzo(a)pyrene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Benzo(b)fluoranthene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Benzo(g,h,i)perylene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Benzo(k)fluoranthene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
bis(2-Chloroethoxy)methane	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
bis(2-Chloroethyl)ether	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
bis(2-Chloroisopropyl)ether	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
bis(2-Ethylhexyl)phthalate	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Butyl benzylphthalate	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Carbazole	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Chrysene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Dibenz(a,h)anthracene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Dibenzofuran	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Diethyl phthalate	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Dimethyl phthalate	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Di-n-butylphthalate	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Di-n-octyl phthalate	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Fluoranthene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Fluorene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Hexachlorobenzene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Hexachlorobutadiene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Hexachlorocyclopentadiene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Hexachloroethane	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Indeno(1,2,3-cd)pyrene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Isophorone	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Naphthalene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Nitrobenzene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
N-Nitrosodi-n-propylamine	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
N-Nitrosodiphenylamine	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Pentachlorophenol	ug/L	ND(1300)	-	ND(1300)	-	ND(1300)	-	ND(1300)
Phenanthrene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)
Phenol	ug/L	1600	-	1500	-	810	-	650
Pyrene	ug/L	ND(500)	-	ND(500)	-	ND(500)	-	ND(500)

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-100800-WP-021*	*GW-100900-WP-041*	*GW-101000-WP-050*	*GW-101100-WP-060*	*GW-101200-WP-078*	*GW-101300-WP-088*	*GW-101400-WP-103*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/10/2000*	*10/11/2000*	*10/12/2000*	*10/13/2000*	*10/14/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	870	830	740	600	570	570	550
General Chemistry								
Ammonia	mg/L	83	88	76	74	66	55	51
Cyanide (total)	mg/L	0.057 J	-	0.075	-	0.031	-	0.053
Phenolics (Total)	mg/L	15	14	10	8.2	6.4	6.6	3.9
Thiocyanate	mg/L	330	-	300	-	42	-	32

TABLE F.1

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-101500-WP-116*	*GW-101600-WP-131*	*GW-101700-WP-147*	*GW-101800-WP-155*	*GW-101900-WP-180*	*GW-102000-WP-190*	*GW-102100-WP-196*
Sample Date:		*10/15/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,1,2-Trichloroethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,1-Dichloroethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,1-Dichloroethene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,2-Dichloroethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,2-Dichloropropane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
2-Butanone	ug/L	-	-	ND(5.0)	-	ND(5.0)	-	ND(5.0)
2-Hexanone	ug/L	-	-	ND(5.0)	-	ND(5.0)	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	-	ND(5.0)	-	ND(5.0)	-	ND(5.0)
Acetone	ug/L	-	-	ND(5.0)	-	5.7	-	ND(5.0)
Benzene	ug/L	-	-	27	-	26	-	23
Bromodichloromethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Bromoform	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Bromomethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Carbon disulfide	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Carbon tetrachloride	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chlorobenzene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chlorobromomethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chloroethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chloroform	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chloromethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Methylene chloride	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Styrene	ug/L	-	-	ND(1.0)	-	1.1	-	1.0
Tetrachloroethene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Toluene	ug/L	-	-	11	-	11	-	10.0
trans-1,2-Dichloroethene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Trichloroethene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Vinyl chloride	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Xylene (total)	ug/L	-	-	5.9	-	6.1	-	5.6
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
1,2-Dichlorobenzene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
1,3-Dichlorobenzene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
1,4-Dichlorobenzene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
2,4,5-Trichlorophenol	ug/L	-	-	ND(50)	-	ND(250)	-	ND(500)
2,4,6-Trichlorophenol	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
2,4-Dichlorophenol	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
2,4-Dimethylphenol	ug/L	-	-	220	-	120	-	240
2,4-Dinitrophenol	ug/L	-	-	ND(50)	-	ND(250)	-	ND(500)
2,4-Dinitrotoluene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
2,6-Dinitrotoluene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
2-Chloronaphthalene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
2-Chlorophenol	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-101500-WP-116*	*GW-101600-WP-131*	*GW-101700-WP-147*	*GW-101800-WP-155*	*GW-101900-WP-180*	*GW-102000-WP-190*	*GW-102100-WP-196*
Sample Date:		*10/15/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
2-Methylphenol	ug/L	-	-	560	-	750	-	710
2-Nitroaniline	ug/L	-	-	ND(50)	-	ND(250)	-	ND(500)
2-Nitrophenol	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
3,3'-Dichlorobenzidine	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
3-Nitroaniline	ug/L	-	-	ND(50)	-	ND(250)	-	ND(500)
4,6-Dinitro-2-methylphenol	ug/L	-	-	ND(50)	-	ND(250)	-	ND(500)
4-Bromophenyl phenyl ether	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
4-Chloro-3-methylphenol	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
4-Chloroaniline	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
4-Chlorophenyl phenyl ether	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
4-Methylphenol	ug/L	-	-	1100	-	790	-	1300
4-Nitroaniline	ug/L	-	-	ND(50)	-	ND(250)	-	ND(500)
4-Nitrophenol	ug/L	-	-	ND(50)	-	ND(250)	-	ND(500)
Acenaphthene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Acenaphthylene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Anthracene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Benzo(a)anthracene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Benzo(a)pyrene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Benzo(b)fluoranthene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Benzo(g,h,i)perylene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Benzo(k)fluoranthene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
bis(2-Chloroethoxy)methane	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
bis(2-Chloroethyl)ether	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
bis(2-Chloroisopropyl)ether	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Butyl benzylphthalate	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Carbazole	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Chrysene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Dibenz(a,h)anthracene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Dibenzofuran	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Diethyl phthalate	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Dimethyl phthalate	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Di-n-butylphthalate	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Di-n-octyl phthalate	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Fluoranthene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Fluorene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Hexachlorobenzene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Hexachlorobutadiene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Hexachlorocyclopentadiene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Hexachloroethane	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Isophorone	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Naphthalene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Nitrobenzene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
N-Nitrosodi-n-propylamine	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
N-Nitrosodiphenylamine	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Pentachlorophenol	ug/L	-	-	ND(50)	-	ND(250)	-	ND(500)
Phenanthrene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)
Phenol	ug/L	-	-	260	-	820	-	330
Pyrene	ug/L	-	-	ND(20)	-	ND(100)	-	ND(200)

TABLE F.1

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-101500-WP-116*	*GW-101600-WP-131*	*GW-101700-WP-147*	*GW-101800-WP-155*	*GW-101900-WP-180*	*GW-102000-WP-190*	*GW-102100-WP-196*
Sample Date:		*10/15/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	570	540	530	530	580	540	550
General Chemistry								
Ammonia	mg/L	32	40	36	40 J	40	35	28
Cyanide (total)	mg/L	-	-	0.092	-	0.053	-	0.019 J
Phenolics (Total)	mg/L	4.8 J	4.2 J	2.6	4.2	570	4.5	3 0
Thiocyanate	mg/L	-	-	48	-	34	-	24

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-102200-WP-210*	*GW-102500-WP-251*	*GW-102700-WP-289*	*GW-102900-WP-327*	*GW-103100-WP-371*	*GW-110200-WP-404*	*GW-110600-WP-471*
Sample Date:		*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*	*11/6/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1 0)
1,1,2-Trichloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,1-Dichloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,1-Dichloroethene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,2-Dichloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,2-Dichloropropane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
2-Butanone	ug/L	-	-	-	ND(5.0)	-	-	ND(5.0)
2-Hexanone	ug/L	-	-	-	ND(5.0)	-	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	-	-	ND(5.0)	-	-	ND(5.0)
Acetone	ug/L	-	-	-	ND(5.0)	-	-	ND(5.0)
Benzene	ug/L	-	-	-	17	-	-	15
Bromodichloromethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Bromoform	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Bromomethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Carbon disulfide	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Carbon tetrachloride	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Chlorobenzene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Chlorobromomethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Chloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Chloroform	ug/L	-	-	-	ND(1.0)	-	-	ND(1 0)
Chloromethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	-	-	ND(1.0)	-	-	ND(1 0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Methylene chloride	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Styrene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Tetrachloroethene	ug/L	-	-	-	ND(1.0)	-	-	ND(1 0)
Toluene	ug/L	-	-	-	8.1	-	-	6.5
trans-1,2-Dichloroethene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Trichloroethene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Vinyl chloride	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Xylene (total)	ug/L	-	-	-	4.8	-	-	3.9
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	-	ND(100)	-	-	ND(100)
1,2-Dichlorobenzene	ug/L	-	-	-	ND(100)	-	-	ND(100)
1,3-Dichlorobenzene	ug/L	-	-	-	ND(100)	-	-	ND(100)
1,4-Dichlorobenzene	ug/L	-	-	-	ND(100)	-	-	ND(100)
2,4,5-Trichlorophenol	ug/L	-	-	-	ND(250)	-	-	ND(250)
2,4,6-Trichlorophenol	ug/L	-	-	-	ND(100)	-	-	ND(100)
2,4-Dichlorophenol	ug/L	-	-	-	ND(100)	-	-	ND(100)
2,4-Dimethylphenol	ug/L	-	-	-	220	-	-	200
2,4-Dinitrophenol	ug/L	-	-	-	ND(250)	-	-	ND(250)
2,4-Dinitrotoluene	ug/L	-	-	-	ND(100)	-	-	ND(100)
2,6-Dinitrotoluene	ug/L	-	-	-	ND(100)	-	-	ND(100)
2-Chloronaphthalene	ug/L	-	-	-	ND(100)	-	-	ND(100)
2-Chlorophenol	ug/L	-	-	-	ND(100)	-	-	ND(100)

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-102200-WP-210*	*GW-102500-WP-251*	*GW-102700-WP-289*	*GW-102900-WP-327*	*GW-103100-WP-371*	*GW-110200-WP-404*	*GW-110600-WP-471*
Sample Date:		*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*	*11/6/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	-	ND(100)	-	-	ND(100)
2-Methylphenol	ug/L	-	-	-	470	-	-	490
2-Nitroaniline	ug/L	-	-	-	ND(250)	-	-	ND(250)
2-Nitrophenol	ug/L	-	-	-	ND(100)	-	-	ND(100)
3,3'-Dichlorobenzidine	ug/L	-	-	-	ND(100)	-	-	ND(100)
3-Nitroaniline	ug/L	-	-	-	ND(250)	-	-	ND(250)
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	ND(250)	-	-	ND(250)
4-Bromophenyl phenyl ether	ug/L	-	-	-	ND(100)	-	-	ND(100)
4-Chloro-3-methylphenol	ug/L	-	-	-	ND(100)	-	-	ND(100)
4-Chloroaniline	ug/L	-	-	-	ND(100)	-	-	ND(100)
4-Chlorophenyl phenyl ether	ug/L	-	-	-	ND(100)	-	-	ND(100)
4-Methylphenol	ug/L	-	-	-	860	-	-	800
4-Nitroaniline	ug/L	-	-	-	ND(250)	-	-	ND(250)
4-Nitrophenol	ug/L	-	-	-	ND(250)	-	-	ND(250)
Acenaphthene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Acenaphthylene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Anthracene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Benzo(a)anthracene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Benzo(a)pyrene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Benzo(b)fluoranthene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Benzo(g,h,i)perylene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Benzo(k)fluoranthene	ug/L	-	-	-	ND(100)	-	-	ND(100)
bis(2-Chloroethoxy)methane	ug/L	-	-	-	ND(100)	-	-	ND(100)
bis(2-Chloroethyl)ether	ug/L	-	-	-	ND(100)	-	-	ND(100)
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	ND(100)	-	-	ND(100)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	ND(100)	-	-	ND(100)
Butyl benzylphthalate	ug/L	-	-	-	ND(100)	-	-	ND(100)
Carbazole	ug/L	-	-	-	ND(100)	-	-	ND(100)
Chrysene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Dibenz(a,h)anthracene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Dibenzofuran	ug/L	-	-	-	ND(100)	-	-	ND(100)
Diethyl phthalate	ug/L	-	-	-	ND(100)	-	-	ND(100)
Dimethyl phthalate	ug/L	-	-	-	ND(100)	-	-	ND(100)
Di-n-butylphthalate	ug/L	-	-	-	ND(100)	-	-	ND(100)
Di-n-octyl phthalate	ug/L	-	-	-	ND(100)	-	-	ND(100)
Fluoranthene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Fluorene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Hexachlorobenzene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Hexachlorobutadiene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Hexachlorocyclopentadiene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Hexachloroethane	ug/L	-	-	-	ND(100)	-	-	ND(100)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Isophorone	ug/L	-	-	-	ND(100)	-	-	ND(100)
Naphthalene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Nitrobenzene	ug/L	-	-	-	ND(100)	-	-	ND(100)
N-Nitrosodi-n-propylamine	ug/L	-	-	-	ND(100)	-	-	ND(100)
N-Nitrosodiphenylamine	ug/L	-	-	-	ND(100)	-	-	ND(100)
Pentachlorophenol	ug/L	-	-	-	ND(250)	-	-	ND(250)
Phenanthrene	ug/L	-	-	-	ND(100)	-	-	ND(100)
Phenol	ug/L	-	-	-	260	-	-	160
Pyrene	ug/L	-	-	-	ND(100)	-	-	ND(100)

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-102200-WP-210*	*GW-102500-WP-251*	*GW-102700-WP-289*	*GW-102900-WP-327*	*GW-103100-WP-371*	*GW-110200-WP-404*	*GW-110600-WP-471*
Sample Date:		*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*	*11/6/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	500	520	570	600	530	230	550
General Chemistry								
Ammonia	mg/L	21	17	22	21	30	44	18
Cyanide (total)	mg/L	-	-	-	0.059	-	-	0.060
Phenolics (Total)	mg/L	4.4	2.5	3.2	2.3	2.9	3.1	2.2
Thiocyanate	mg/L	-	-	-	14	-	-	9.4

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-110800-WP-489*	*GW-111000-WP-516*	*GW-111300-WP-562*	*GW-111500-WP-589*	*GW-112000-WP-668*	*GW-112700-WP-694*	*GW-121800-WP-699*
Sample Date:		*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	-	-	-	ND(1.0)	ND(1 0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	-	-	ND(1.0)	ND(1 0)
1,1,2-Trichloroethane	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
1,1-Dichloroethane	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	-	-	-	-	-	ND(1.0)	ND(1 0)
1,2-Dichloropropane	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
2-Butanone	ug/L	-	-	-	-	-	ND(5.0)	ND(5.0)
2-Hexanone	ug/L	-	-	-	-	-	ND(5.0)	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	-	-	-	-	ND(5.0)	ND(5.0)
Acetone	ug/L	-	-	-	-	-	ND(5.0)	ND(5.0)
Benzene	ug/L	-	-	-	-	-	12	9.1
Bromodichloromethane	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Bromoform	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Bromomethane	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Carbon disulfide	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Carbon tetrachloride	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Chlorobenzene	ug/L	-	-	-	-	-	ND(1.0)	ND(1 0)
Chlorobromomethane	ug/L	-	-	-	-	-	ND(1.0)	-
Chloroethane	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Chloroform	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Chloromethane	ug/L	-	-	-	-	-	ND(1.0)	1.7
cis-1,2-Dichloroethene	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	-	-	-	-	ND(1.0)	ND(1 0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	ND(1 0)
Ethylbenzene	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Methylene chloride	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Styrene	ug/L	-	-	-	-	-	ND(1.0)	ND(1 0)
Tetrachloroethene	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Toluene	ug/L	-	-	-	-	-	5.7	5.1
trans-1,2-Dichloroethene	ug/L	-	-	-	-	-	ND(1.0)	ND(1 0)
trans-1,3-Dichloropropene	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Trichloroethene	ug/L	-	-	-	-	-	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	-	-	-	-	-	ND(1.0)	ND(2.0)
Xylene (total)	ug/L	-	-	-	-	-	3.8	2.6
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	-	-	-	ND(10)	ND(10)
1,2-Dichlorobenzene	ug/L	-	-	-	-	-	ND(10)	ND(10)
1,3-Dichlorobenzene	ug/L	-	-	-	-	-	ND(10)	ND(10)
1,4-Dichlorobenzene	ug/L	-	-	-	-	-	ND(10)	ND(10)
2,4,5-Trichlorophenol	ug/L	-	-	-	-	-	ND(25)	ND(25)
2,4,6-Trichlorophenol	ug/L	-	-	-	-	-	ND(10)	ND(10)
2,4-Dichlorophenol	ug/L	-	-	-	-	-	ND(10)	ND(10)
2,4-Dimethylphenol	ug/L	-	-	-	-	-	160	120
2,4-Dinitrophenol	ug/L	-	-	-	-	-	ND(25)	ND(25)
2,4-Dinitrotoluene	ug/L	-	-	-	-	-	ND(10)	ND(10)
2,6-Dinitrotoluene	ug/L	-	-	-	-	-	ND(10)	ND(10)
2-Chloronaphthalene	ug/L	-	-	-	-	-	ND(10)	ND(10)
2-Chlorophenol	ug/L	-	-	-	-	-	ND(10)	ND(10)

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-110800-WP-489*	*GW-111000-WP-516*	*GW-111300-WP-562*	*GW-111500-WP-589*	*GW-112000-WP-668*	*GW-112700-WP-694*	*GW-121800-WP-699*
Sample Date:		11/8/2000	11/10/2000	11/13/2000	11/15/2000	11/20/2000	11/27/2000	12/18/2000
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	-	-	-	ND(10)	ND(10)
2-Methylphenol	ug/L	-	-	-	-	-	110	36
2-Nitroaniline	ug/L	-	-	-	-	-	ND(25)	ND(25)
2-Nitrophenol	ug/L	-	-	-	-	-	ND(10)	ND(10)
3,3'-Dichlorobenzidine	ug/L	-	-	-	-	-	ND(10)	ND(10)
3-Nitroaniline	ug/L	-	-	-	-	-	ND(25)	ND(25)
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	-	-	ND(25)	ND(25)
4-Bromophenyl phenyl ether	ug/L	-	-	-	-	-	ND(10)	ND(10)
4-Chloro-3-methylphenol	ug/L	-	-	-	-	-	ND(10)	ND(10)
4-Chloroaniline	ug/L	-	-	-	-	-	ND(10)	ND(10)
4-Chlorophenyl phenyl ether	ug/L	-	-	-	-	-	ND(10)	ND(10)
4-Methylphenol	ug/L	-	-	-	-	-	71	40
4-Nitroaniline	ug/L	-	-	-	-	-	ND(25)	ND(25)
4-Nitrophenol	ug/L	-	-	-	-	-	ND(25)	ND(25)
Acenaphthene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Acenaphthylene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Anthracene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Benzo(a)anthracene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Benzo(a)pyrene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Benzo(b)fluoranthene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Benzo(g,h,i)perylene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Benzo(k)fluoranthene	ug/L	-	-	-	-	-	ND(10)	ND(10)
bis(2-Chloroethoxy)methane	ug/L	-	-	-	-	-	ND(10)	ND(10)
bis(2-Chloroethyl)ether	ug/L	-	-	-	-	-	ND(10)	ND(10)
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	-	-	ND(10)	ND(10)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	-	-	ND(10)	ND(10)
Butyl benzylphthalate	ug/L	-	-	-	-	-	ND(10)	ND(10)
Carbazole	ug/L	-	-	-	-	-	ND(10)	ND(10)
Chrysene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Dibenz(a,h)anthracene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Dibenzofuran	ug/L	-	-	-	-	-	ND(10)	ND(10)
Diethyl phthalate	ug/L	-	-	-	-	-	ND(10)	ND(10)
Dimethyl phthalate	ug/L	-	-	-	-	-	ND(10)	ND(10)
Di-n-butylphthalate	ug/L	-	-	-	-	-	ND(10)	ND(10)
Di-n-octyl phthalate	ug/L	-	-	-	-	-	ND(10)	ND(10)
Fluoranthene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Fluorene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Hexachlorobenzene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Hexachlorobutadiene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Hexachlorocyclopentadiene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Hexachloroethane	ug/L	-	-	-	-	-	ND(10)	ND(10)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Isophorone	ug/L	-	-	-	-	-	ND(10)	ND(10)
Naphthalene	ug/L	-	-	-	-	-	19	17
Nitrobenzene	ug/L	-	-	-	-	-	ND(10)	ND(10)
N-Nitrosodi-n-propylamine	ug/L	-	-	-	-	-	ND(10)	ND(10)
N-Nitrosodiphenylamine	ug/L	-	-	-	-	-	ND(10)	ND(10)
Pentachlorophenol	ug/L	-	-	-	-	-	ND(25)	ND(25)
Phenanthrene	ug/L	-	-	-	-	-	ND(10)	ND(10)
Phenol	ug/L	-	-	-	-	-	13	ND(10)
Pyrene	ug/L	-	-	-	-	-	ND(10)	ND(10)

GROUNDWATER ANALYTICAL RESULTS - WN-1A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*	*WN-1A*
Sample ID:		*GW-110800-WP-489*	*GW-111000-WP-516*	*GW-111300-WP-562*	*GW-111500-WP-589*	*GW-112000-WP-668*	*GW-112700-WP-694*	*GW-121800-WP-699*
Sample Date:		*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	550	520	440	520	480	490	550
General Chemistry								
Ammonia	mg/L	18	15	13	11	10	10	11
Cyanide (total)	mg/L	-	-	-	-	-	0.15 J	0.081
Phenolics (Total)	mg/L	4.6	1.1	0.78	0.93	0.89	0.32	0.19
Thiocyanate	mg/L	-	-	-	-	-	13	4.1

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-100800-WP-022*	*GW-100900-WP-040*	*GW-101000-WP-051*	*GW-101100-WP-061*	*GW-101200-WP-079*	*GW-101300-WP-089*	*GW-101400-WP-104*
Sample Date.		*10/8/2000*	*10/9/2000*	*10/10/2000*	*10/11/2000*	*10/12/2000*	*10/13/2000*	*10/14/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1 0)
1,1,2-Trichloroethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,1-Dichloroethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
2-Butanone	ug/L	ND(5.0)	-	ND(5.0)	-	ND(5.0)	-	ND(5.0)
2-Hexanone	ug/L	ND(5.0)	-	ND(5.0)	-	ND(5.0)	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(5.0)	-	ND(5.0)	-	ND(5 0)	-	ND(5.0)
Acetone	ug/L	12	-	16	-	11	-	5.8
Benzene	ug/L	52	-	69	-	56	-	42
Bromodichloromethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Bromoform	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Bromomethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Carbon disulfide	ug/L	1.0	-	3.0	-	2.0	-	ND(1 0)
Carbon tetrachloride	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chlorobromomethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1 0)
Chloroethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chloroform	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1 0)
Chloromethane	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1 0)	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	1.3	-	1.6	-	1.3	-	1.1
Methylene chloride	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Styrene	ug/L	1.8	-	ND(1.0)	-	1.8	-	1.5
Tetrachloroethene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Toluene	ug/L	16	-	23	-	16	-	13
trans-1,2-Dichloroethene	ug/L	ND(1 0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Trichloroethene	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Vinyl chloride	ug/L	ND(1.0)	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Xylene (total)	ug/L	12	-	15	-	11	-	9.7
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
1,2-Dichlorobenzene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
1,3-Dichlorobenzene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
1,4-Dichlorobenzene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
2,4,5-Trichlorophenol	ug/L	ND(630)	-	ND(1300)	-	ND(1300)	-	ND(1300)
2,4,6-Trichlorophenol	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
2,4-Dichlorophenol	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
2,4-Dimethylphenol	ug/L	510	-	800	-	890	-	580
2,4-Dinitrophenol	ug/L	ND(630)	-	ND(1300)	-	ND(1300)	-	ND(1300)
2,4-Dinitrotoluene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
2,6-Dinitrotoluene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
2-Chloronaphthalene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
2-Chlorophenol	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)

TABLE F.2

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-100800-WP-022*	*GW-100900-WP-040*	*GW-101000-WP-051*	*GW-101100-WP-061*	*GW-101200-WP-079*	*GW-101300-WP-089*	*GW-101400-WP-104*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/10/2000*	*10/11/2000*	*10/12/2000*	*10/13/2000*	*10/14/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
2-Methylphenol	ug/L	1600	-	2600	-	2400	-	1800
2-Nitroaniline	ug/L	ND(630)	-	ND(1300)	-	ND(1300)	-	ND(1300)
2-Nitrophenol	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
3,3'-Dichlorobenzidine	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
3-Nitroaniline	ug/L	ND(630)	-	ND(1300)	-	ND(1300)	-	ND(1300)
4,6-Dinitro-2-methylphenol	ug/L	ND(630)	-	ND(1300)	-	ND(1300)	-	ND(1300)
4-Bromophenyl phenyl ether	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
4-Chloro-3-methylphenol	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
4-Chloroaniline	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
4-Chlorophenyl phenyl ether	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
4-Methylphenol	ug/L	3300	-	6400	-	6500	-	5200
4-Nitroaniline	ug/L	ND(630)	-	ND(1300)	-	ND(1300)	-	ND(1300)
4-Nitrophenol	ug/L	ND(630)	-	ND(1300)	-	ND(1300)	-	ND(1300)
Acenaphthene	ug/L	ND(250) UJ	-	ND(500)	-	ND(500)	-	ND(500)
Acenaphthylene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Anthracene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Benzo(a)anthracene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Benzo(a)pyrene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Benzo(b)fluoranthene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Benzo(g,h,i)perylene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Benzo(k)fluoranthene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
bis(2-Chloroethoxy)methane	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
bis(2-Chloroethyl)ether	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
bis(2-Chloroisopropyl)ether	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
bis(2-Ethylhexyl)phthalate	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Butyl benzylphthalate	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Carbazole	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Chrysene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Dibenz(a,h)anthracene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Dibenzofuran	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Diethyl phthalate	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Dimethyl phthalate	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Di-n-butylphthalate	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Di-n-octyl phthalate	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Fluoranthene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Fluorene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Hexachlorobenzene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Hexachlorobutadiene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Hexachlorocyclopentadiene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Hexachloroethane	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Indeno(1,2,3-cd)pyrene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Isophorone	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Naphthalene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Nitrobenzene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
N-Nitrosodi-n-propylamine	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
N-Nitrosodiphenylamine	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Pentachlorophenol	ug/L	ND(630)	-	ND(1300)	-	ND(1300)	-	ND(1300)
Phenanthrene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)
Phenol	ug/L	7000	-	12000	-	7900	-	5400
Pyrene	ug/L	ND(250)	-	ND(500)	-	ND(500)	-	ND(500)

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-100800-WP-022*	*GW-100900-WP-040*	*GW-101000-WP-051*	*GW-101100-WP-061*	*GW-101200-WP-079*	*GW-101300-WP-089*	*GW-101400-WP-104*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/10/2000*	*10/11/2000*	*10/12/2000*	*10/13/2000*	*10/14/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	670	680	820	740	660	540	500
General Chemistry								
Ammonia	mg/L	110	110	110	120	98	97	88
Cyanide (total)	mg/L	ND(0.010) UJ	-	0.10	-	0.060	-	ND(0.010)
Phenolics (Total)	mg/L	30	47	72	52	49	28	23
Thiocyanate	mg/L	280	-	270	-	98	-	76

TABLE F.2

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-101500-WP-117*	*GW-101600-WP-132*	*GW-101700-WP-148*	*GW-101800-WP-156*	*GW-101900-WP-181*	*GW-102000-WP-191*	*GW-102100-WP-197*
Sample Date:		*10/15/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,1,2-Trichloroethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,1-Dichloroethane	ug/L	-	-	ND(1.0)	-	ND(1 0)	-	ND(1 0)
1,1-Dichloroethene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
1,2-Dichloroethane	ug/L	-	-	ND(1.0)	-	ND(1 0)	-	ND(1.0)
1,2-Dichloropropane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1 0)
2-Butanone	ug/L	-	-	ND(5.0)	-	ND(5.0)	-	ND(5.0)
2-Hexanone	ug/L	-	-	ND(5.0)	-	ND(5.0)	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	-	ND(5.0)	-	ND(5.0)	-	ND(5.0)
Acetone	ug/L	-	-	ND(5.0)	-	ND(5.0)	-	ND(5.0)
Benzene	ug/L	-	-	31	-	26	-	23
Bromodichloromethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Bromoform	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1 0)
Bromomethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Carbon disulfide	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Carbon tetrachloride	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chlorobenzene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1 0)
Chlorobromomethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chloroethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chloroform	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Chloromethane	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	1.0	-	ND(1.0)	-	ND(1.0)
Methylene chloride	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Styrene	ug/L	-	-	1.3	-	1.3	-	1.6
Tetrachloroethene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Toluene	ug/L	-	-	13	-	11	-	14
trans-1,2-Dichloroethene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Trichloroethene	ug/L	-	-	ND(1.0)	-	ND(1.0)	-	ND(1.0)
Vinyl chloride	ug/L	-	-	ND(1.0)	-	ND(1 0)	-	ND(1.0)
Xylene (total)	ug/L	-	-	9.7	-	8.9	-	9.9
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
1,2-Dichlorobenzene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
1,3-Dichlorobenzene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
1,4-Dichlorobenzene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
2,4,5-Trichlorophenol	ug/L	-	-	ND(500)	-	ND(500)	-	ND(1300)
2,4,6-Trichlorophenol	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
2,4-Dichlorophenol	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
2,4-Dimethylphenol	ug/L	-	-	250	-	ND(200)	-	ND(500)
2,4-Dinitrophenol	ug/L	-	-	ND(500)	-	ND(500)	-	ND(1300)
2,4-Dinitrotoluene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
2,6-Dinitrotoluene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
2-Chloronaphthalene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
2-Chlorophenol	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-101500-WP-117*	*GW-101600-WP-132*	*GW-101700-WP-148*	*GW-101800-WP-156*	*GW-101900-WP-181*	*GW-102000-WP-191*	*GW-102100-WP-197*
Sample Date:		*10/15/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
2-Methylphenol	ug/L	-	-	710	-	480	-	890
2-Nitroaniline	ug/L	-	-	ND(500)	-	ND(500)	-	ND(1300)
2-Nitrophenol	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
3,3'-Dichlorobenzidine	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
3-Nitroaniline	ug/L	-	-	ND(500)	-	ND(500)	-	ND(1300)
4,6-Dinitro-2-methylphenol	ug/L	-	-	ND(500)	-	ND(500)	-	ND(1300)
4-Bromophenyl phenyl ether	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
4-Chloro-3-methylphenol	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
4-Chloroaniline	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
4-Chlorophenyl phenyl ether	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
4-Methylphenol	ug/L	-	-	2100	-	1400	-	2400
4-Nitroaniline	ug/L	-	-	ND(500)	-	ND(500)	-	ND(1300)
4-Nitrophenol	ug/L	-	-	ND(500)	-	ND(500)	-	ND(1300)
Acenaphthene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Acenaphthylene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Anthracene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Benzo(a)anthracene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Benzo(a)pyrene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Benzo(b)fluoranthene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Benzo(g,h,i)perylene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Benzo(k)fluoranthene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
bis(2-Chloroethoxy)methane	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
bis(2-Chloroethyl)ether	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
bis(2-Chloroisopropyl)ether	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Butyl benzylphthalate	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Carbazole	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Chrysene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Dibenz(a,h)anthracene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Dibenzofuran	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Diethyl phthalate	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Dimethyl phthalate	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Di-n-butylphthalate	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Di-n-octyl phthalate	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Fluoranthene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Fluorene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Hexachlorobenzene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Hexachlorobutadiene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Hexachlorocyclopentadiene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Hexachloroethane	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Isophorone	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Naphthalene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Nitrobenzene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
N-Nitrosodi-n-propylamine	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
N-Nitrosodiphenylamine	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Pentachlorophenol	ug/L	-	-	ND(500)	-	ND(500)	-	ND(1300)
Phenanthrene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)
Phenol	ug/L	-	-	1800	-	890	-	1700
Pyrene	ug/L	-	-	ND(200)	-	ND(200)	-	ND(500)

TABLE F.2

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-101500-WP-117*	*GW-101600-WP-132*	*GW-101700-WP-148*	*GW-101800-WP-156*	*GW-101900-WP-181*	*GW-102000-WP-191*	*GW-102100-WP-197*
Sample Date:		*10/15/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	460	370	330	330	260	280	230
General Chemistry								
Ammonia	mg/L	59	86	50	70 J	68	69	64
Cyanide (total)	mg/L	-	-	0.10	-	0.049	-	ND(0.010)
Phenolics (Total)	mg/L	15 J	11 J	6.9	6.8	5.8	3.9	3.1
Thiocyanate	mg/L	-	-	45	-	24	-	25

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID.		*GW-102200-WP-211*	*GW-102500-WP-252*	*GW-102700-WP-290*	*GW-102900-WP-328*	*GW-103100-WP-372*	*GW-110200-WP-405*	*GW-110600-WP-472*
Sample Date:		*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*	*11/6/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,1,2-Trichloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,1-Dichloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,1-Dichloroethene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,2-Dichloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
1,2-Dichloropropane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
2-Butanone	ug/L	-	-	-	ND(5.0)	-	-	ND(5.0)
2-Hexanone	ug/L	-	-	-	ND(5.0)	-	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	-	-	ND(5.0)	-	-	ND(5.0)
Acetone	ug/L	-	-	-	ND(5.0)	-	-	ND(5.0)
Benzene	ug/L	-	-	-	24	-	-	26
Bromodichloromethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Bromoform	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Bromomethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Carbon disulfide	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Carbon tetrachloride	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Chlorobenzene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Chlorobromomethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Chloroethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Chloroform	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Chloromethane	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Methylene chloride	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Styrene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Tetrachloroethene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Toluene	ug/L	-	-	-	7.1	-	-	5.9
trans-1,2-Dichloroethene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Trichloroethene	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Vinyl chloride	ug/L	-	-	-	ND(1.0)	-	-	ND(1.0)
Xylene (total)	ug/L	-	-	-	7.4	-	-	6 5
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	-	ND(200)	-	-	ND(100)
1,2-Dichlorobenzene	ug/L	-	-	-	ND(200)	-	-	ND(100)
1,3-Dichlorobenzene	ug/L	-	-	-	ND(200)	-	-	ND(100)
1,4-Dichlorobenzene	ug/L	-	-	-	ND(200)	-	-	ND(100)
2,4,5-Trichlorophenol	ug/L	-	-	-	ND(500)	-	-	ND(250)
2,4,6-Trichlorophenol	ug/L	-	-	-	ND(200)	-	-	ND(100)
2,4-Dichlorophenol	ug/L	-	-	-	ND(200)	-	-	ND(100)
2,4-Dimethylphenol	ug/L	-	-	-	ND(200)	-	-	190
2,4-Dinitrophenol	ug/L	-	-	-	ND(500)	-	-	ND(250)
2,4-Dinitrotoluene	ug/L	-	-	-	ND(200)	-	-	ND(100)
2,6-Dinitrotoluene	ug/L	-	-	-	ND(200)	-	-	ND(100)
2-Chloronaphthalene	ug/L	-	-	-	ND(200)	-	-	ND(100)
2-Chlorophenol	ug/L	-	-	-	ND(200)	-	-	ND(100)

TABLE F.2

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-102200-WP-211*	*GW-102500-WP-252*	*GW-102700-WP-290*	*GW-102900-WP-328*	*GW-103100-WP-372*	*GW-110200-WP-405*	*GW-110600-WP-472*
Sample Date:		*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*	*11/6/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	-	ND(200)	-	-	ND(100)
2-Methylphenol	ug/L	-	-	-	430	-	-	550
2-Nitroaniline	ug/L	-	-	-	ND(500)	-	-	ND(250)
2-Nitrophenol	ug/L	-	-	-	ND(200)	-	-	ND(100)
3,3'-Dichlorobenzidine	ug/L	-	-	-	ND(200)	-	-	ND(100)
3-Nitroaniline	ug/L	-	-	-	ND(500)	-	-	ND(250)
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	ND(500)	-	-	ND(250)
4-Bromophenyl phenyl ether	ug/L	-	-	-	ND(200)	-	-	ND(100)
4-Chloro-3-methylphenol	ug/L	-	-	-	ND(200)	-	-	ND(100)
4-Chloroaniline	ug/L	-	-	-	ND(200)	-	-	ND(100)
4-Chlorophenyl phenyl ether	ug/L	-	-	-	ND(200)	-	-	ND(100)
4-Methylphenol	ug/L	-	-	-	1100	-	-	1200
4-Nitroaniline	ug/L	-	-	-	ND(500)	-	-	ND(250)
4-Nitrophenol	ug/L	-	-	-	ND(500)	-	-	ND(250)
Acenaphthene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Acenaphthylene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Anthracene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Benzo(a)anthracene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Benzo(a)pyrene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Benzo(b)fluoranthene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Benzo(g,h,i)perylene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Benzo(k)fluoranthene	ug/L	-	-	-	ND(200)	-	-	ND(100)
bis(2-Chloroethoxy)methane	ug/L	-	-	-	ND(200)	-	-	ND(100)
bis(2-Chloroethyl)ether	ug/L	-	-	-	ND(200)	-	-	ND(100)
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	ND(200)	-	-	ND(100)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	ND(200)	-	-	ND(100)
Butyl benzylphthalate	ug/L	-	-	-	ND(200)	-	-	ND(100)
Carbazole	ug/L	-	-	-	ND(200)	-	-	ND(100)
Chrysene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Dibenz(a,h)anthracene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Dibenzofuran	ug/L	-	-	-	ND(200)	-	-	ND(100)
Diethyl phthalate	ug/L	-	-	-	ND(200)	-	-	ND(100)
Dimethyl phthalate	ug/L	-	-	-	ND(200)	-	-	ND(100)
Di-n-butylphthalate	ug/L	-	-	-	ND(200)	-	-	ND(100)
Di-n-octyl phthalate	ug/L	-	-	-	ND(200)	-	-	ND(100)
Fluoranthene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Fluorene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Hexachlorobenzene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Hexachlorobutadiene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Hexachlorocyclopentadiene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Hexachloroethane	ug/L	-	-	-	ND(200)	-	-	ND(100)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Isophorone	ug/L	-	-	-	ND(200)	-	-	ND(100)
Naphthalene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Nitrobenzene	ug/L	-	-	-	ND(200)	-	-	ND(100)
N-Nitrosodi-n-propylamine	ug/L	-	-	-	ND(200)	-	-	ND(100)
N-Nitrosodiphenylamine	ug/L	-	-	-	ND(200)	-	-	ND(100)
Pentachlorophenol	ug/L	-	-	-	ND(500)	-	-	ND(250)
Phenanthrene	ug/L	-	-	-	ND(200)	-	-	ND(100)
Phenol	ug/L	-	-	-	400	-	-	240
Pyrene	ug/L	-	-	-	ND(200)	-	-	ND(100)

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-102200-WP-211*	*GW-102500-WP-252*	*GW-102700-WP-290*	*GW-102900-WP-328*	*GW-103100-WP-372*	*GW-110200-WP-405*	*GW-110600-WP-472*
Sample Date:		*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*	*11/6/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	230	280	280	260	260	870	200
General Chemistry								
Ammonia	mg/L	42	42	51	46	42	79	39
Cyanide (total)	mg/L	-	-	-	0.029	-	-	0.043
Phenolics (Total)	mg/L	4 0	4.2	3.9	2.4	3.5	6.5	2.2
Thiocyanate	mg/L	-	-	-	35	-	-	25

TABLE F.2

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-110800-WP-490*	*GW-111000-WP-517*	*GW-111300-WP-563*	*GW-111500-WP-590*	*GW-112700-WP-695*	*GW-121800-WP-700*
Sample Date:		*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*						
Volatiles							
1,1,1-Trichloroethane	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
1,1-Dichloroethane	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
1,2-Dichloropropane	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
2-Butanone	ug/L	-	-	-	-	ND(5.0)	ND(5.0)
2-Hexanone	ug/L	-	-	-	-	ND(5.0)	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	-	-	-	ND(5.0)	ND(5.0)
Acetone	ug/L	-	-	-	-	ND(5 0)	ND(5 0)
Benzene	ug/L	-	-	-	-	21	17
Bromodichloromethane	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Bromoform	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Bromomethane	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Carbon disulfide	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Carbon tetrachloride	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Chlorobenzene	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Chlorobromomethane	ug/L	-	-	-	-	ND(1.0)	-
Chloroethane	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Chloroform	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Chloromethane	ug/L	-	-	-	-	ND(1.0)	1.7
cis-1,2-Dichloroethene	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	ND(1.0)
Ethylbenzene	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Methylene chloride	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Styrene	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Tetrachloroethene	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Toluene	ug/L	-	-	-	-	3.9	3.9
trans-1,2-Dichloroethene	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	-	-	-	ND(1.0)	ND(1 0)
Trichloroethene	ug/L	-	-	-	-	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	-	-	-	-	ND(1.0)	ND(2.0)
Xylene (total)	ug/L	-	-	-	-	5.6	3.8
Semi - Volatiles							
1,2,4-Trichlorobenzene	ug/L	-	-	-	-	ND(30)	ND(20)
1,2-Dichlorobenzene	ug/L	-	-	-	-	ND(30)	ND(20)
1,3-Dichlorobenzene	ug/L	-	-	-	-	ND(30)	ND(20)
1,4-Dichlorobenzene	ug/L	-	-	-	-	ND(30)	ND(20)
2,4,5-Trichlorophenol	ug/L	-	-	-	-	ND(75)	ND(50)
2,4,6-Trichlorophenol	ug/L	-	-	-	-	ND(30)	ND(20)
2,4-Dichlorophenol	ug/L	-	-	-	-	ND(30)	ND(20)
2,4-Dimethylphenol	ug/L	-	-	-	-	71	83
2,4-Dinitrophenol	ug/L	-	-	-	-	ND(75)	ND(50)
2,4-Dinitrotoluene	ug/L	-	-	-	-	ND(30)	ND(20)
2,6-Dinitrotoluene	ug/L	-	-	-	-	ND(30)	ND(20)
2-Chloronaphthalene	ug/L	-	-	-	-	ND(30)	ND(20)
2-Chlorophenol	ug/L	-	-	-	-	ND(30)	ND(20)

TABLE F.2

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-110800-WP-490*	*GW-111000-WP-517*	*GW-111300-WP-563*	*GW-111500-WP-590*	*GW-112700-WP-695*	*GW-121800-WP-700*
Sample Date:		*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*						
2-Methyl naphthalene	ug/L	-	-	-	-	ND(30)	ND(20)
2-Methylphenol	ug/L	-	-	-	-	220	260
2-Nitroaniline	ug/L	-	-	-	-	ND(75)	ND(50)
2-Nitrophenol	ug/L	-	-	-	-	ND(30)	ND(20)
3,3'-Dichlorobenzidine	ug/L	-	-	-	-	ND(30)	ND(20)
3-Nitroaniline	ug/L	-	-	-	-	ND(75)	ND(50)
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	-	ND(75)	ND(50)
4-Bromophenyl phenyl ether	ug/L	-	-	-	-	ND(30)	ND(20)
4-Chloro-3-methylphenol	ug/L	-	-	-	-	ND(30)	ND(20)
4-Chloroaniline	ug/L	-	-	-	-	ND(30)	ND(20)
4-Chlorophenyl phenyl ether	ug/L	-	-	-	-	ND(30)	ND(20)
4-Methylphenol	ug/L	-	-	-	-	260	250
4-Nitroaniline	ug/L	-	-	-	-	ND(75)	ND(50)
4-Nitrophenol	ug/L	-	-	-	-	ND(75)	ND(50)
Acenaphthene	ug/L	-	-	-	-	ND(30)	ND(20)
Acenaphthylene	ug/L	-	-	-	-	ND(30)	ND(20)
Anthracene	ug/L	-	-	-	-	ND(30)	ND(20)
Benzo(a)anthracene	ug/L	-	-	-	-	ND(30)	ND(20)
Benzo(a)pyrene	ug/L	-	-	-	-	ND(30)	ND(20)
Benzo(b)fluoranthene	ug/L	-	-	-	-	ND(30)	ND(20)
Benzo(g,h,i)perylene	ug/L	-	-	-	-	ND(30)	ND(20)
Benzo(k)fluoranthene	ug/L	-	-	-	-	ND(30)	ND(20)
bis(2-Chloroethoxy)methane	ug/L	-	-	-	-	ND(30)	ND(20)
bis(2-Chloroethyl)ether	ug/L	-	-	-	-	ND(30)	ND(20)
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	-	ND(30)	ND(20)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	-	ND(30)	36
Butyl benzylphthalate	ug/L	-	-	-	-	ND(30)	ND(20)
Carbazole	ug/L	-	-	-	-	ND(30)	ND(20)
Chrysene	ug/L	-	-	-	-	ND(30)	ND(20)
Dibenz(a,h)anthracene	ug/L	-	-	-	-	ND(30)	ND(20)
Dibenzofuran	ug/L	-	-	-	-	ND(30)	ND(20)
Diethyl phthalate	ug/L	-	-	-	-	ND(30)	ND(20)
Dimethyl phthalate	ug/L	-	-	-	-	ND(30)	ND(20)
Di-n-butylphthalate	ug/L	-	-	-	-	ND(30)	ND(20)
Di-n-octyl phthalate	ug/L	-	-	-	-	ND(30)	ND(20)
Fluoranthene	ug/L	-	-	-	-	ND(30)	ND(20)
Fluorene	ug/L	-	-	-	-	ND(30)	ND(20)
Hexachlorobenzene	ug/L	-	-	-	-	ND(30)	ND(20)
Hexachlorobutadiene	ug/L	-	-	-	-	ND(30)	ND(20)
Hexachlorocyclopentadiene	ug/L	-	-	-	-	ND(30)	ND(20)
Hexachloroethane	ug/L	-	-	-	-	ND(30)	ND(20)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	-	ND(30)	ND(20)
Isophorone	ug/L	-	-	-	-	ND(30)	ND(20)
Naphthalene	ug/L	-	-	-	-	ND(30)	33
Nitrobenzene	ug/L	-	-	-	-	ND(30)	ND(20)
N-Nitrosodi-n-propylamine	ug/L	-	-	-	-	ND(30)	ND(20)
N-Nitrosodiphenylamine	ug/L	-	-	-	-	ND(30)	ND(20)
Pentachlorophenol	ug/L	-	-	-	-	ND(75)	ND(50)
Phenanthrene	ug/L	-	-	-	-	ND(30)	ND(20)
Phenol	ug/L	-	-	-	-	ND(30)	ND(20)
Pyrene	ug/L	-	-	-	-	ND(30)	ND(20)

TABLE F.2

GROUNDWATER ANALYTICAL RESULTS - WN-1B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*	*WN-1B*
Sample ID:		*GW-110800-WP-490*	*GW-111000-WP-517*	*GW-111300-WP-563*	*GW-111500-WP-590*	*GW-112700-WP-695*	*GW-121800-WP-700*
Sample Date.		*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/27/2000*	*12/18/2000*
Parameter -	*Unit*						
Metals							
Arsenic	ug/L	280	250	200	250	140	140
General Chemistry							
Ammonia	mg/L	32	32	35	25	27	25
Cyanide (total)	mg/L	-	-	-	-	0.12 J	0.065
Phenolics (Total)	mg/L	3.6	2.5	2.1	2.1	1.1	0.68
Thiocyanate	mg/L	-	-	-	-	18	5.5

GROUNDWATER ANALY..AL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-100800-WP-023*	*GW-100900-WP-039*	*GW-101000-WP-052*	*GW-101100-WP-062*	*GW-101200-WP-080*	*GW-101300-WP-090*	*GW-101400-WP-105*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/10/2000*	*10/11/2000*	*10/12/2000*	*10/13/2000*	*10/14/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
1,1-Dichloroethane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
1,1-Dichloroethene	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
1,2-Dichloroethane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
1,2-Dichloropropane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
2-Butanone	ug/L	13	-	12	-	ND(10)	-	15
2-Hexanone	ug/L	ND(10)	-	ND(10)	-	ND(10)	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(10)	-	ND(10)	-	ND(10)	-	ND(5.0)
Acetone	ug/L	68	-	50	-	50	-	90
Benzene	ug/L	250	-	240	-	230	-	240
Bromodichloromethane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Bromoform	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Bromomethane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Carbon disulfide	ug/L	56	-	14	-	7.8	-	18
Carbon tetrachloride	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Chlorobenzene	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Chlorobromomethane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Chloroethane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Chloroform	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1 0)
Chloromethane	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1 0)
cis-1,3-Dichloropropene	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	2.4	-	2.3	-	2.0	-	2.7
Methylene chloride	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Styrene	ug/L	9.9	-	9.5	-	7 6	-	11
Tetrachloroethene	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Toluene	ug/L	110	-	99	-	99	-	160
trans-1,2-Dichloroethene	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1 0)
Trichloroethene	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Vinyl chloride	ug/L	ND(2.0)	-	ND(2.0)	-	ND(2.0)	-	ND(1.0)
Xylene (total)	ug/L	51	-	46	-	40	-	61
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
1,2-Dichlorobenzene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
1,3-Dichlorobenzene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
1,4-Dichlorobenzene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
2,4,5-Trichlorophenol	ug/L	ND(13000)	-	ND(13000)	-	ND(13000)	-	ND(13000)
2,4,6-Trichlorophenol	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
2,4-Dichlorophenol	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
2,4-Dimethylphenol	ug/L	ND(5000)	-	5300	-	ND(5000)	-	6600
2,4-Dinitrophenol	ug/L	ND(13000)	-	ND(13000)	-	ND(13000)	-	ND(13000)
2,4-Dinitrotoluene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
2,6-Dinitrotoluene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
2-Chloronaphthalene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
2-Chlorophenol	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)

TABLE F.3

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-100800-WP-023*	*GW-100900-WP-039*	*GW-101000-WP-052*	*GW-101100-WP-062*	*GW-101200-WP-080*	*GW-101300-WP-090*	*GW-101400-WP-105*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/10/2000*	*10/11/2000*	*10/12/2000*	*10/13/2000*	*10/14/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
2-Methylphenol	ug/L	13000	-	14000	-	7400	-	13000
2-Nitroaniline	ug/L	ND(13000)	-	ND(13000)	-	ND(13000)	-	ND(13000)
2-Nitrophenol	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
3,3'-Dichlorobenzidine	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
3-Nitroaniline	ug/L	ND(13000)	-	ND(13000)	-	ND(13000)	-	ND(13000)
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	-	ND(13000)	-	ND(13000)	-	ND(13000)
4-Bromophenyl phenyl ether	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
4-Chloro-3-methylphenol	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
4-Chloroaniline	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
4-Methylphenol	ug/L	35000	-	40000	-	21000	-	42000
4-Nitroaniline	ug/L	ND(13000)	-	ND(13000)	-	ND(13000)	-	ND(13000)
4-Nitrophenol	ug/L	ND(13000)	-	ND(13000)	-	ND(13000)	-	ND(13000)
Acenaphthene	ug/L	ND(5000) UJ	-	ND(5000)	-	ND(5000)	-	ND(5000)
Acenaphthylene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Anthracene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Benzo(a)anthracene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Benzo(a)pyrene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Benzo(b)fluoranthene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Benzo(g,h,i)perylene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Benzo(k)fluoranthene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
bis(2-Chloroethyl)ether	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Butyl benzylphthalate	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Carbazole	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Chrysene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Dibenz(a,h)anthracene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Dibenzofuran	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Diethyl phthalate	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Dimethyl phthalate	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Di-n-butylphthalate	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Di-n-octyl phthalate	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Fluoranthene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Fluorene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Hexachlorobenzene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Hexachlorobutadiene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Hexachlorocyclopentadiene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Hexachloroethane	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Isophorone	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Naphthalene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Nitrobenzene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
N-Nitrosodiphenylamine	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Pentachlorophenol	ug/L	ND(13000)	-	ND(13000)	-	ND(13000)	-	ND(13000)
Phenanthrene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)
Phenol	ug/L	48000	-	55000	-	26000	-	51000
Pyrene	ug/L	ND(5000)	-	ND(5000)	-	ND(5000)	-	ND(5000)

GROUNDWATER ANAL. .AL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-100800-WP-023*	*GW-100900-WP-039*	*GW-101000-WP-052*	*GW-101100-WP-062*	*GW-101200-WP-080*	*GW-101300-WP-090*	*GW-101400-WP-105*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/10/2000*	*10/11/2000*	*10/12/2000*	*10/13/2000*	*10/14/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	1200	1100	2400	2300	2200	2100	2500
General Chemistry								
Ammonia	mg/L	400	430	510	490	450	440	510
Cyanide (total)	mg/L	0.036 J	-	0.22	-	0.10	-	0.17
Phenolics (Total)	mg/L	200	180	270	160	130	190	230
Thiocyanate	mg/L	770	-	2000	-	550	-	660

TABLE F.3

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-101500-WP-118*	*GW-101500-WP-128*	*GW-101600-WP-133*	*GW-101700-WP-149*	*GW-101800-WP-157*	*GW-101900-WP-182*	*GW-102000-WP-192*
Sample Date:		*10/15/2000*	*10/15/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/19/2000*	*10/20/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
1,1,2-Trichloroethane	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
1,1-Dichloroethane	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
1,1-Dichloroethene	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
1,2-Dichloroethane	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
1,2-Dichloropropane	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
2-Butanone	ug/L	-	-	-	ND(50)	-	10	-
2-Hexanone	ug/L	-	-	-	ND(50)	-	ND(5.0)	-
4-Methyl-2-pentanone	ug/L	-	-	-	ND(50)	-	ND(5 0)	-
Acetone	ug/L	-	-	-	52	-	9.4	-
Benzene	ug/L	-	-	-	360	-	170	-
Bromodichloromethane	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Bromoform	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Bromomethane	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Carbon disulfide	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Carbon tetrachloride	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Chlorobenzene	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Chlorobromomethane	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Chloroethane	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Chloroform	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Chloromethane	ug/L	-	-	-	ND(10)	-	ND(1 0)	-
cis-1,2-Dichloroethene	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
cis-1,3-Dichloropropene	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	-	ND(10)	-	1.5	-
Methylene chloride	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Styrene	ug/L	-	-	-	11	-	6.2	-
Tetrachloroethene	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Toluene	ug/L	-	-	-	210	-	100	-
trans-1,2-Dichloroethene	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
trans-1,3-Dichloropropene	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Trichloroethene	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Vinyl chloride	ug/L	-	-	-	ND(10)	-	ND(1.0)	-
Xylene (total)	ug/L	-	-	-	68	-	36	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
1,2-Dichlorobenzene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
1,3-Dichlorobenzene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
1,4-Dichlorobenzene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
2,4,5-Trichlorophenol	ug/L	-	-	-	ND(2500)	-	ND(2500)	-
2,4,6-Trichlorophenol	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
2,4-Dichlorophenol	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
2,4-Dimethylphenol	ug/L	-	-	-	3000	-	1600	-
2,4-Dinitrophenol	ug/L	-	-	-	ND(2500)	-	ND(2500)	-
2,4-Dinitrotoluene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
2,6-Dinitrotoluene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
2-Chloronaphthalene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
2-Chlorophenol	ug/L	-	-	-	ND(1000)	-	ND(1000)	-

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-101500-WP-118*	*GW-101500-WP-128*	*GW-101600-WP-133*	*GW-101700-WP-149*	*GW-101800-WP-157*	*GW-101900-WP-182*	*GW-102000-WP-192*
Sample Date:		*10/15/2000*	*10/15/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/19/2000*	*10/20/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
2-Methylphenol	ug/L	-	-	-	5300	-	2600	-
2-Nitroaniline	ug/L	-	-	-	ND(2500)	-	ND(2500)	-
2-Nitrophenol	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
3,3'-Dichlorobenzidine	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
3-Nitroaniline	ug/L	-	-	-	ND(2500)	-	ND(2500)	-
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	ND(2500)	-	ND(2500)	-
4-Bromophenyl phenyl ether	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
4-Chloro-3-methylphenol	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
4-Chloroaniline	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
4-Chlorophenyl phenyl ether	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
4-Methylphenol	ug/L	-	-	-	15000	-	8200	-
4-Nitroaniline	ug/L	-	-	-	ND(2500)	-	ND(2500)	-
4-Nitrophenol	ug/L	-	-	-	ND(2500)	-	ND(2500)	-
Acenaphthene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Acenaphthylene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Anthracene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Benzo(a)anthracene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Benzo(a)pyrene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Benzo(b)fluoranthene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Benzo(g,h,i)perylene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Benzo(k)fluoranthene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
bis(2-Chloroethoxy)methane	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
bis(2-Chloroethyl)ether	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Butyl benzylphthalate	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Carbazole	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Chrysene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Dibenz(a,h)anthracene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Dibenzofuran	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Diethyl phthalate	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Dimethyl phthalate	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Di-n-butylphthalate	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Di-n-octyl phthalate	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Fluoranthene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Fluorene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Hexachlorobenzene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Hexachlorobutadiene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Hexachlorocyclopentadiene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Hexachloroethane	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Isophorone	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Naphthalene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Nitrobenzene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
N-Nitrosodi-n-propylamine	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
N-Nitrosodiphenylamine	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Pentachlorophenol	ug/L	-	-	-	ND(2500)	-	ND(2500)	-
Phenanthrene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-
Phenol	ug/L	-	-	-	15000	-	5700	-
Pyrene	ug/L	-	-	-	ND(1000)	-	ND(1000)	-

TABLE F.3

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-101500-WP-118*	*GW-101500-WP-128*	*GW-101600-WP-133*	*GW-101700-WP-149*	*GW-101800-WP-157*	*GW-101900-WP-182*	*GW-102000-WP-192*
Sample Date:		*10/15/2000*	*10/15/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/19/2000*	*10/20/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	2700	2900	2900	2500	2100	1600	280
General Chemistry								
Ammonia	mg/L	310	390	320	170	240 J	140	70
Cyanide (total)	mg/L	-	-	-	0.096	-	ND(0.010)	-
Phenolics (Total)	mg/L	410 J	210 J	150 J	40	4.6	33	4.1
Thiocyanate	mg/L	-	-	-	3100	-	1900	-

GROUNDWATER ANAL. .AL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-102100-WP-198*	*GW-102200-WP-212*	*GW-102500-WP-253*	*GW-102700-WP-291*	*GW-102900-WP-329*	*GW-103100-WP-373*	*GW-110200-WP-406*
Sample Date:		*10/21/2000*	*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
1,1,2-Trichloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
1,1-Dichloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
1,1-Dichloroethene	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
1,2-Dichloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
1,2-Dichloropropane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
2-Butanone	ug/L	ND(50)	-	-	-	ND(5.0)	-	-
2-Hexanone	ug/L	ND(50)	-	-	-	ND(5.0)	-	-
4-Methyl-2-pentanone	ug/L	ND(50)	-	-	-	ND(5.0)	-	-
Acetone	ug/L	ND(50)	-	-	-	5.3	-	-
Benzene	ug/L	210	-	-	-	110	-	-
Bromodichloromethane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Bromoform	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Bromomethane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Carbon disulfide	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Carbon tetrachloride	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Chlorobenzene	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Chlorobromomethane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Chloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Chloroform	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Chloromethane	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
cis-1,2-Dichloroethene	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
cis-1,3-Dichloropropene	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Methylene chloride	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Styrene	ug/L	ND(10)	-	-	-	4.0	-	-
Tetrachloroethene	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Toluene	ug/L	130	-	-	-	74	-	-
trans-1,2-Dichloroethene	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
trans-1,3-Dichloropropene	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Trichloroethene	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Vinyl chloride	ug/L	ND(10)	-	-	-	ND(1.0)	-	-
Xylene (total)	ug/L	43	-	-	-	25	-	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
1,2-Dichlorobenzene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
1,3-Dichlorobenzene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
1,4-Dichlorobenzene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
2,4,5-Trichlorophenol	ug/L	ND(2500)	-	-	-	ND(1300)	-	-
2,4,6-Trichlorophenol	ug/L	ND(1000)	-	-	-	ND(500)	-	-
2,4-Dichlorophenol	ug/L	ND(1000)	-	-	-	ND(500)	-	-
2,4-Dimethylphenol	ug/L	ND(1000)	-	-	-	850	-	-
2,4-Dinitrophenol	ug/L	ND(2500)	-	-	-	ND(1300)	-	-
2,4-Dinitrotoluene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
2,6-Dinitrotoluene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
2-Chloronaphthalene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
2-Chlorophenol	ug/L	ND(1000)	-	-	-	ND(500)	-	-

TABLE F.3

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-102100-WP-198*	*GW-102200-WP-212*	*GW-102500-WP-253*	*GW-102700-WP-291*	*GW-102900-WP-329*	*GW-103100-WP-373*	*GW-110200-WP-406*
Sample Date:		*10/21/2000*	*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
2-Methylphenol	ug/L	1800	-	-	-	1100	-	-
2-Nitroaniline	ug/L	ND(2500)	-	-	-	ND(1300)	-	-
2-Nitrophenol	ug/L	ND(1000)	-	-	-	ND(500)	-	-
3,3'-Dichlorobenzidine	ug/L	ND(1000)	-	-	-	ND(500)	-	-
3-Nitroaniline	ug/L	ND(2500)	-	-	-	ND(1300)	-	-
4,6-Dinitro-2-methylphenol	ug/L	ND(2500)	-	-	-	ND(1300)	-	-
4-Bromophenyl phenyl ether	ug/L	ND(1000)	-	-	-	ND(500)	-	-
4-Chloro-3-methylphenol	ug/L	ND(1000)	-	-	-	ND(500)	-	-
4-Chloroaniline	ug/L	ND(1000)	-	-	-	ND(500)	-	-
4-Chlorophenyl phenyl ether	ug/L	ND(1000)	-	-	-	ND(500)	-	-
4-Methylphenol	ug/L	5400	-	-	-	3000	-	-
4-Nitroaniline	ug/L	ND(2500)	-	-	-	ND(1300)	-	-
4-Nitrophenol	ug/L	ND(2500)	-	-	-	ND(1300)	-	-
Acenaphthene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Acenaphthylene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Anthracene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Benzo(a)anthracene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Benzo(a)pyrene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Benzo(b)fluoranthene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Benzo(g,h,i)perylene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Benzo(k)fluoranthene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
bis(2-Chloroethoxy)methane	ug/L	ND(1000)	-	-	-	ND(500)	-	-
bis(2-Chloroethyl)ether	ug/L	ND(1000)	-	-	-	ND(500)	-	-
bis(2-Chloroisopropyl)ether	ug/L	ND(1000)	-	-	-	ND(500)	-	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Butyl benzylphthalate	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Carbazole	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Chrysene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Dibenz(a,h)anthracene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Dibenzofuran	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Diethyl phthalate	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Dimethyl phthalate	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Di-n-butylphthalate	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Di-n-octyl phthalate	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Fluoranthene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Fluorene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Hexachlorobenzene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Hexachlorobutadiene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Hexachlorocyclopentadiene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Hexachloroethane	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Isophorone	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Naphthalene	ug/L	ND(1000)	-	-	-	830	-	-
Nitrobenzene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
N-Nitrosodi-n-propylamine	ug/L	ND(1000)	-	-	-	ND(500)	-	-
N-Nitrosodiphenylamine	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Pentachlorophenol	ug/L	ND(2500)	-	-	-	ND(1300)	-	-
Phenanthrene	ug/L	ND(1000)	-	-	-	ND(500)	-	-
Phenol	ug/L	2600	-	-	-	2000	-	-
Pyrene	ug/L	ND(1000)	-	-	-	ND(500)	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-102100-WP-198*	*GW-102200-WP-212*	*GW-102500-WP-253*	*GW-102700-WP-291*	*GW-102900-WP-329*	*GW-103100-WP-373*	*GW-110200-WP-406*
Sample Date:		*10/21/2000*	*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	1300	1100	920	850	850	870	730
General Chemistry								
Ammonia	mg/L	45	82	63	83	80	77	69
Cyanide (total)	mg/L	ND(0 010)	-	-	-	0.056	-	-
Phenolics (Total)	mg/L	14	11	12	12	8.2	7.3	2.8
Thiocyanate	mg/L	150	-	-	-	130	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-110600-WP-473*	*GW-110800-WP-491*	*GW-111000-WP-518*	*GW-111300-WP-564*	*GW-111500-WP-591*	*GW-112000-WP-670*	*GW-112700-WP-696*
Sample Date:		*11/6/2000*	*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*	*11/27/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(1.0)	-	-	-	-	-	ND(1 0)
1,1-Dichloroethane	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
2-Butanone	ug/L	ND(5.0)	-	-	-	-	-	ND(5.0)
2-Hexanone	ug/L	ND(5.0)	-	-	-	-	-	ND(5 0)
4-Methyl-2-pentanone	ug/L	ND(5.0)	-	-	-	-	-	ND(5.0)
Acetone	ug/L	ND(5.0)	-	-	-	-	-	5.4
Benzene	ug/L	97	-	-	-	-	-	58
Bromodichloromethane	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Bromoform	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Bromomethane	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Carbon disulfide	ug/L	ND(1 0)	-	-	-	-	-	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Chlorobromomethane	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Chloroethane	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Chloroform	ug/L	1 2	-	-	-	-	-	2.4
Chloromethane	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Methylene chloride	ug/L	ND(1.0)	-	-	-	-	-	ND(1 0)
Styrene	ug/L	3.4	-	-	-	-	-	3 1
Tetrachloroethene	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Toluene	ug/L	59	-	-	-	-	-	52
trans-1,2-Dichloroethene	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Trichloroethene	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Vinyl chloride	ug/L	ND(1.0)	-	-	-	-	-	ND(1.0)
Xylene (total)	ug/L	21	-	-	-	-	-	18
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(200)	-	-	-	-	-	ND(100)
1,2-Dichlorobenzene	ug/L	ND(200)	-	-	-	-	-	ND(100)
1,3-Dichlorobenzene	ug/L	ND(200)	-	-	-	-	-	ND(100)
1,4-Dichlorobenzene	ug/L	ND(200)	-	-	-	-	-	ND(100)
2,4,5-Trichlorophenol	ug/L	ND(500)	-	-	-	-	-	ND(250)
2,4,6-Trichlorophenol	ug/L	ND(200)	-	-	-	-	-	ND(100)
2,4-Dichlorophenol	ug/L	ND(200)	-	-	-	-	-	ND(100)
2,4-Dimethylphenol	ug/L	410	-	-	-	-	-	710
2,4-Dinitrophenol	ug/L	ND(500)	-	-	-	-	-	ND(250)
2,4-Dinitrotoluene	ug/L	ND(200)	-	-	-	-	-	ND(100)
2,6-Dinitrotoluene	ug/L	ND(200)	-	-	-	-	-	ND(100)
2-Chloronaphthalene	ug/L	ND(200)	-	-	-	-	-	ND(100)
2-Chlorophenol	ug/L	ND(200)	-	-	-	-	-	100)

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-110600-WP-473*	*GW-110800-WP-491*	*GW-111000-WP-518*	*GW-111300-WP-564*	*GW-111500-WP-591*	*GW-112000-WP-670*	*GW-112700-WP-696*
Sample Date:		*11/6/2000*	*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*	*11/27/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(200)	-	-	-	-	-	ND(100)
2-Methylphenol	ug/L	430	-	-	-	-	-	600
2-Nitroaniline	ug/L	ND(500)	-	-	-	-	-	ND(250)
2-Nitrophenol	ug/L	ND(200)	-	-	-	-	-	ND(100)
3,3'-Dichlorobenzidine	ug/L	ND(200)	-	-	-	-	-	ND(100)
3-Nitroaniline	ug/L	ND(500)	-	-	-	-	-	ND(250)
4,6-Dinitro-2-methylphenol	ug/L	ND(500)	-	-	-	-	-	ND(250)
4-Bromophenyl phenyl ether	ug/L	ND(200)	-	-	-	-	-	ND(100)
4-Chloro-3-methylphenol	ug/L	ND(200)	-	-	-	-	-	ND(100)
4-Chloroaniline	ug/L	ND(200)	-	-	-	-	-	ND(100)
4-Chlorophenyl phenyl ether	ug/L	ND(200)	-	-	-	-	-	ND(100)
4-Methylphenol	ug/L	1200	-	-	-	-	-	1500
4-Nitroaniline	ug/L	ND(500)	-	-	-	-	-	ND(250)
4-Nitrophenol	ug/L	ND(500)	-	-	-	-	-	ND(250)
Acenaphthene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Acenaphthylene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Anthracene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Benzo(a)anthracene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Benzo(a)pyrene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Benzo(b)fluoranthene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Benzo(g,h,i)perylene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Benzo(k)fluoranthene	ug/L	ND(200)	-	-	-	-	-	ND(100)
bis(2-Chloroethoxy)methane	ug/L	ND(200)	-	-	-	-	-	ND(100)
bis(2-Chloroethyl)ether	ug/L	ND(200)	-	-	-	-	-	ND(100)
bis(2-Chloroisopropyl)ether	ug/L	ND(200)	-	-	-	-	-	ND(100)
bis(2-Ethylhexyl)phthalate	ug/L	ND(200)	-	-	-	-	-	ND(100)
Butyl benzylphthalate	ug/L	ND(200)	-	-	-	-	-	ND(100)
Carbazole	ug/L	ND(200)	-	-	-	-	-	ND(100)
Chrysene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Dibenz(a,h)anthracene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Dibenzofuran	ug/L	ND(200)	-	-	-	-	-	ND(100)
Diethyl phthalate	ug/L	ND(200)	-	-	-	-	-	ND(100)
Dimethyl phthalate	ug/L	ND(200)	-	-	-	-	-	ND(100)
Di-n-butylphthalate	ug/L	ND(200)	-	-	-	-	-	ND(100)
Di-n-octyl phthalate	ug/L	ND(200)	-	-	-	-	-	ND(100)
Fluoranthene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Fluorene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Hexachlorobenzene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Hexachlorobutadiene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Hexachlorocyclopentadiene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Hexachloroethane	ug/L	ND(200)	-	-	-	-	-	ND(100)
Indeno(1,2,3-cd)pyrene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Isophorone	ug/L	ND(200)	-	-	-	-	-	ND(100)
Naphthalene	ug/L	600	-	-	-	-	-	810
Nitrobenzene	ug/L	ND(200)	-	-	-	-	-	ND(100)
N-Nitrosodi-n-propylamine	ug/L	ND(200)	-	-	-	-	-	ND(100)
N-Nitrosodiphenylamine	ug/L	ND(200)	-	-	-	-	-	ND(100)
Pentachlorophenol	ug/L	ND(500)	-	-	-	-	-	ND(250)
Phenanthrene	ug/L	ND(200)	-	-	-	-	-	ND(100)
Phenol	ug/L	820	-	-	-	-	-	950
Pyrene	ug/L	ND(200)	-	-	-	-	-	ND(100)

TABLE F.3

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*	*WN-1C*
Sample ID:		*GW-110600-WP-473*	*GW-110800-WP-491*	*GW-111000-WP-518*	*GW-111300-WP-564*	*GW-111500-WP-591*	*GW-112000-WP-670*	*GW-112700-WP-696*
Sample Date:		*11/6/2000*	*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*	*11/27/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	410	820	750	560	710	660	710
General Chemistry								
Ammonia	mg/L	75	71	67	78	66	68	72
Cyanide (total)	mg/L	ND(0.010)	-	-	-	-	-	0.092 J
Phenolics (Total)	mg/L	7.2	8.2	6 1	5.1	3.9	5.2	4.2
Thiocyanate	mg/L	12	-	-	-	-	-	160

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*
Sample ID:		*GW-121800-WP-701*
Sample Date:		*12/18/2000*
Parameter	***Unit***	
Volatiles		
1,1,1-Trichloroethane	ug/L	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1 0)
1,1,2-Trichloroethane	ug/L	ND(1 0)
1,1-Dichloroethane	ug/L	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)
2-Butanone	ug/L	ND(5.0)
2-Hexanone	ug/L	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(5.0)
Acetone	ug/L	ND(5.0)
Benzene	ug/L	59
Bromodichloromethane	ug/L	ND(1 0)
Bromoform	ug/L	ND(1.0)
Bromomethane	ug/L	ND(1.0)
Carbon disulfide	ug/L	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)
Chlorobenzene	ug/L	ND(1 0)
Chlorobromomethane	ug/L	-
Chloroethane	ug/L	ND(1.0)
Chloroform	ug/L	1.7
Chloromethane	ug/L	1 7
cis-1,2-Dichloroethene	ug/L	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(1 0)
Dibromochloromethane	ug/L	ND(1.0)
Ethylbenzene	ug/L	ND(1.0)
Methylene chloride	ug/L	ND(1.0)
Styrene	ug/L	2.7
Tetrachloroethene	ug/L	ND(1.0)
Toluene	ug/L	59
trans-1,2-Dichloroethene	ug/L	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)
Trichloroethene	ug/L	ND(1.0)
Vinyl chloride	ug/L	ND(2.0)
Xylene (total)	ug/L	16
Semi - Volatiles		
1,2,4-Trichlorobenzene	ug/L	ND(100)
1,2-Dichlorobenzene	ug/L	ND(100)
1,3-Dichlorobenzene	ug/L	ND(100)
1,4-Dichlorobenzene	ug/L	ND(100)
2,4,5-Trichlorophenol	ug/L	ND(250)
2,4,6-Trichlorophenol	ug/L	ND(100)
2,4-Dichlorophenol	ug/L	ND(100)
2,4-Dimethylphenol	ug/L	900
2,4-Dinitrophenol	ug/L	ND(250)
2,4-Dinitrotoluene	ug/L	ND(100)
2,6-Dinitrotoluene	ug/L	ND(100)
2-Chloronaphthalene	ug/L	ND(100)
2-Chlorophenol	ug/L	ND(100)

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1C*
Sample ID:		*GW-121800-WP-701*
Sample Date:		*12/18/2000*
Parameter	*Unit*	
2-Methyl naphthalene	ug/L	ND(100)
2-Methylphenol	ug/L	660
2-Nitroaniline	ug/L	ND(250)
2-Nitrophenol	ug/L	ND(100)
3,3'-Dichlorobenzidine	ug/L	ND(100)
3-Nitroaniline	ug/L	ND(250)
4,6-Dinitro-2-methylphenol	ug/L	ND(250)
4-Bromophenyl phenyl ether	ug/L	ND(100)
4-Chloro-3-methylphenol	ug/L	ND(100)
4-Chloroaniline	ug/L	ND(100)
4-Chlorophenyl phenyl ether	ug/L	ND(100)
4-Methylphenol	ug/L	1500
4-Nitroaniline	ug/L	ND(250)
4-Nitrophenol	ug/L	ND(250)
Acenaphthene	ug/L	ND(100)
Acenaphthylene	ug/L	ND(100)
Anthracene	ug/L	ND(100)
Benzo(a)anthracene	ug/L	ND(100)
Benzo(a)pyrene	ug/L	ND(100)
Benzo(b)fluoranthene	ug/L	ND(100)
Benzo(g,h,i)perylene	ug/L	ND(100)
Benzo(k)fluoranthene	ug/L	ND(100)
bis(2-Chloroethoxy)methane	ug/L	ND(100)
bis(2-Chloroethyl)ether	ug/L	ND(100)
bis(2-Chloroisopropyl)ether	ug/L	ND(100)
bis(2-Ethylhexyl)phthalate	ug/L	ND(100)
Butyl benzylphthalate	ug/L	ND(100)
Carbazole	ug/L	ND(100)
Chrysene	ug/L	ND(100)
Dibenz(a,h)anthracene	ug/L	ND(100)
Dibenzofuran	ug/L	ND(100)
Diethyl phthalate	ug/L	ND(100)
Dimethyl phthalate	ug/L	ND(100)
Di-n-butylphthalate	ug/L	ND(100)
Di-n-octyl phthalate	ug/L	ND(100)
Fluoranthene	ug/L	ND(100)
Fluorene	ug/L	ND(100)
Hexachlorobenzene	ug/L	ND(100)
Hexachlorobutadiene	ug/L	ND(100)
Hexachlorocyclopentadiene	ug/L	ND(100)
Hexachloroethane	ug/L	ND(100)
Indeno(1,2,3-cd)pyrene	ug/L	ND(100)
Isophorone	ug/L	ND(100)
Naphthalene	ug/L	760
Nitrobenzene	ug/L	ND(100)
N-Nitrosodi-n-propylamine	ug/L	ND(100)
N-Nitrosodiphenylamine	ug/L	ND(100)
Pentachlorophenol	ug/L	ND(250)
Phenanthrene	ug/L	ND(100)
Phenol	ug/L	1500
Pyrene	ug/L	ND(100)

GROUNDWATER ANALYTICAL RESULTS - WN-1C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		WN-1C
Sample ID:		GW-121800-WP-701
Sample Date:		12/18/2000
Parameter	*Unit*	
Metals		
Arsenic	ug/L	520
General Chemistry		
Ammonia	mg/L	73
Cyanide (total)	mg/L	0.034
Phenolics (Total)	mg/L	6.6
Thiocyanate	mg/L	23

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-100800-WP-024*	*GW-100900-WP-038*	*GW-100900-WP-048*	*GW-101000-WP-053*	*GW-101000-WP-058*	*GW-101100-WP-063*	*GW-101100-WP-076*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/9/2000*	*10/10/2000*	*10/10/2000*	*10/11/2000*	*10/11/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
1,1,2,2-Tetrachloroethane	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
1,1,2-Trichloroethane	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
1,1-Dichloroethane	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
1,1-Dichloroethene	ug/L	ND(5 0)	-	-	ND(5.0)	-	-	-
1,2-Dichloroethane	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
1,2-Dichloropropane	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
2-Butanone	ug/L	62	-	-	55	-	-	-
2-Hexanone	ug/L	ND(25)	-	-	ND(25)	-	-	-
4-Methyl-2-pentanone	ug/L	ND(25)	-	-	ND(25)	-	-	-
Acetone	ug/L	230	-	-	250	-	-	-
Benzene	ug/L	720	-	-	780	-	-	-
Bromodichloromethane	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Bromoform	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Bromomethane	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Carbon disulfide	ug/L	17	-	-	7.1	-	-	-
Carbon tetrachloride	ug/L	ND(5 0)	-	-	ND(5.0)	-	-	-
Chlorobenzene	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Chlorobromomethane	ug/L	ND(5 0)	-	-	ND(5.0)	-	-	-
Chloroethane	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Chloroform	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Chloromethane	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
cis-1,2-Dichloroethene	ug/L	ND(5 0)	-	-	ND(5.0)	-	-	-
cis-1,3-Dichloropropene	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	6.0	-	-	6.1	-	-	-
Methylene chloride	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Styrene	ug/L	30	-	-	31	-	-	-
Tetrachloroethene	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Toluene	ug/L	220	-	-	260	-	-	-
trans-1,2-Dichloroethene	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
trans-1,3-Dichloropropene	ug/L	ND(5.0)	-	-	ND(5 0)	-	-	-
Trichloroethene	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Vinyl chloride	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	-
Xylene (total)	ug/L	130	-	-	140	-	-	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
1,2-Dichlorobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
1,3-Dichlorobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
1,4-Dichlorobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2,4,5-Trichlorophenol	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
2,4,6-Trichlorophenol	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2,4-Dichlorophenol	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2,4-Dimethylphenol	ug/L	17000	-	-	ND(30000)	-	-	-
2,4-Dinitrophenol	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
2,4-Dinitrotoluene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2,6-Dinitrotoluene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2-Chloronaphthalene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2-Chlorophenol	ug/L	ND(5000)	-	-	ND(30000)	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-100800-WP-024*	*GW-100900-WP-038*	*GW-100900-WP-048*	*GW-101000-WP-053*	*GW-101000-WP-058*	*GW-101100-WP-063*	*GW-101100-WP-076*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/9/2000*	*10/10/2000*	*10/10/2000*	*10/11/2000*	*10/11/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2-Methylphenol	ug/L	44000	-	-	80000	-	-	-
2-Nitroaniline	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
2-Nitrophenol	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
3,3'-Dichlorobenzidine	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
3-Nitroaniline	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
4-Bromophenyl phenyl ether	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
4-Chloro-3-methylphenol	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
4-Chloroaniline	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
4-Methylphenol	ug/L	190000	-	-	220000	-	-	-
4-Nitroaniline	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
4-Nitrophenol	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
Acenaphthene	ug/L	ND(5000) UJ	-	-	ND(30000)	-	-	-
Acenaphthylene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Anthracene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Benzo(a)anthracene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Benzo(a)pyrene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Benzo(b)fluoranthene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Benzo(g,h,i)perylene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Benzo(k)fluoranthene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
bis(2-Chloroethyl)ether	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Butyl benzylphthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Carbazole	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Chrysene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Dibenz(a,h)anthracene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Dibenzofuran	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Diethyl phthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Dimethyl phthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Di-n-butylphthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Di-n-octyl phthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Fluoranthene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Fluorene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Hexachlorobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Hexachlorobutadiene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Hexachlorocyclopentadiene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Hexachloroethane	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Isophorone	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Naphthalene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Nitrobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
N-Nitrosodiphenylamine	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Pentachlorophenol	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
Phenanthrene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Phenol	ug/L	260000	-	-	300000	-	-	-
Pyrene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-

TABLE F.4

GROUNDWATER ANALY[illegible]AL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-100800-WP-024*	*GW-100900-WP-038*	*GW-100900-WP-048*	*GW-101000-WP-053*	*GW-101000-WP-058*	*GW-101100-WP-063*	*GW-101100-WP-076*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/9/2000*	*10/10/2000*	*10/10/2000*	*10/11/2000*	*10/11/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	4900	5200	7100	16000	8800	8700	9400
General Chemistry								
Ammonia	mg/L	1500	1300	1000	1900	990	2000	1300
Cyanide (total)	mg/L	0.81 J	-	-	0.73	-	-	-
Phenolics (Total)	mg/L	1200	1000	1000	1100	1200	1200	1100
Thiocyanate	mg/L	5700	-	-	4500	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-101200-WP-081*	*GW-101200-WP-086*	*GW-101300-WP-091*	*GW-101300-WP-101*	*GW-101400-WP-106*	*GW-101400-WP-114*	*GW-101500-WP-119*
Sample Date:		*10/12/2000*	*10/12/2000*	*10/13/2000*	*10/13/2000*	*10/14/2000*	*10/14/2000*	*10/15/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,1,2-Trichloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,1-Dichloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,1-Dichloroethene	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,2-Dichloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,2-Dichloropropane	ug/L	ND(10)	-	-	-	ND(10)	-	-
2-Butanone	ug/L	72	-	-	-	51	-	-
2-Hexanone	ug/L	ND(50)	-	-	-	ND(50)	-	-
4-Methyl-2-pentanone	ug/L	ND(50)	-	-	-	ND(50)	-	-
Acetone	ug/L	450	-	-	-	260	-	-
Benzene	ug/L	950	-	-	-	780	-	-
Bromodichloromethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
Bromoform	ug/L	ND(10)	-	-	-	ND(10)	-	-
Bromomethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
Carbon disulfide	ug/L	ND(10)	-	-	-	ND(10)	-	-
Carbon tetrachloride	ug/L	ND(10)	-	-	-	ND(10)	-	-
Chlorobenzene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Chlorobromomethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
Chloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
Chloroform	ug/L	ND(10)	-	-	-	ND(10)	-	-
Chloromethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
cis-1,2-Dichloroethene	ug/L	ND(10)	-	-	-	ND(10)	-	-
cis-1,3-Dichloropropene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Methylene chloride	ug/L	ND(10)	-	-	-	ND(10)	-	-
Styrene	ug/L	43	-	-	-	38	-	-
Tetrachloroethene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Toluene	ug/L	360	-	-	-	300	-	-
trans-1,2-Dichloroethene	ug/L	ND(10)	-	-	-	ND(10)	-	-
trans-1,3-Dichloropropene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Trichloroethene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Vinyl chloride	ug/L	ND(10)	-	-	-	ND(10)	-	-
Xylene (total)	ug/L	200	-	-	-	190	-	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
1,2-Dichlorobenzene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
1,3-Dichlorobenzene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
1,4-Dichlorobenzene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
2,4,5-Trichlorophenol	ug/L	ND(13000)	-	-	-	ND(63000)	-	-
2,4,6-Trichlorophenol	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
2,4-Dichlorophenol	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
2,4-Dimethylphenol	ug/L	19000	-	-	-	ND(25000)	-	-
2,4-Dinitrophenol	ug/L	ND(13000)	-	-	-	ND(63000)	-	-
2,4-Dinitrotoluene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
2,6-Dinitrotoluene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
2-Chloronaphthalene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
2-Chlorophenol	ug/L	ND(5000)	-	-	-	ND(25000)	-	-

GROUNDWATER ANAL\ .AL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-101200-WP-081*	*GW-101200-WP-086*	*GW-101300-WP-091*	*GW-101300-WP-101*	*GW-101400-WP-106*	*GW-101400-WP-114*	*GW-101500-WP-119*
Sample Date:		*10/12/2000*	*10/12/2000*	*10/13/2000*	*10/13/2000*	*10/14/2000*	*10/14/2000*	*10/15/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
2-Methylphenol	ug/L	38000	-	-	-	53000	-	-
2-Nitroaniline	ug/L	ND(13000)	-	-	-	ND(63000)	-	-
2-Nitrophenol	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
3,3'-Dichlorobenzidine	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
3-Nitroaniline	ug/L	ND(13000)	-	-	-	ND(63000)	-	-
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	-	-	-	ND(63000)	-	-
4-Bromophenyl phenyl ether	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
4-Chloro-3-methylphenol	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
4-Chloroaniline	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
4-Methylphenol	ug/L	150000	-	-	-	180000	-	-
4-Nitroaniline	ug/L	ND(13000)	-	-	-	ND(63000)	-	-
4-Nitrophenol	ug/L	ND(13000)	-	-	-	ND(63000)	-	-
Acenaphthene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Acenaphthylene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Anthracene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Benzo(a)anthracene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Benzo(a)pyrene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Benzo(b)fluoranthene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Benzo(g,h,i)perylene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Benzo(k)fluoranthene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
bis(2-Chloroethyl)ether	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Butyl benzylphthalate	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Carbazole	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Chrysene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Dibenz(a,h)anthracene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Dibenzofuran	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Diethyl phthalate	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Dimethyl phthalate	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Di-n-butylphthalate	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Di-n-octyl phthalate	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Fluoranthene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Fluorene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Hexachlorobenzene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Hexachlorobutadiene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Hexachlorocyclopentadiene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Hexachloroethane	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Isophorone	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Naphthalene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Nitrobenzene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
N-Nitrosodiphenylamine	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Pentachlorophenol	ug/L	ND(13000)	-	-	-	ND(63000)	-	-
Phenanthrene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-
Phenol	ug/L	210000	-	-	-	250000	-	-
Pyrene	ug/L	ND(5000)	-	-	-	ND(25000)	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-101200-WP-081*	*GW-101200-WP-086*	*GW-101300-WP-091*	*GW-101300-WP-101*	*GW-101400-WP-106*	*GW-101400-WP-114*	*GW-101500-WP-119*
Sample Date:		*10/12/2000*	*10/12/2000*	*10/13/2000*	*10/13/2000*	*10/14/2000*	*10/14/2000*	*10/15/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	-	8600	7000	9000	5100	12000	8300
General Chemistry								
Ammonia	mg/L	1500	1200	1500	3400	1900	320	300
Cyanide (total)	mg/L	0.67	-	-	-	0.77	-	-
Phenolics (Total)	mg/L	1300	1200	1200	1500	970	670 J	520 J
Thiocyanate	mg/L	5600	-	-	-	3700	-	-

GROUNDWATER ANAL. .AL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-101500-WP-129*	*GW-101600-WP-134*	*GW-101600-WP-145*	*GW-101700-WP-150*	*GW-101800-WP-158*	*GW-101800-WP-169*	*GW-101900-WP-183*
Sample Date:		*10/15/2000*	*10/16/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/18/2000*	*10/19/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
1,1,2-Trichloroethane	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
1,1-Dichloroethane	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
1,1-Dichloroethene	ug/L	-	-	-	ND(10)	-	-	ND(1 0)
1,2-Dichloroethane	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
1,2-Dichloropropane	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
2-Butanone	ug/L	-	-	-	ND(50)	-	-	ND(5.0)
2-Hexanone	ug/L	-	-	-	ND(50)	-	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	-	-	ND(50)	-	-	ND(5.0)
Acetone	ug/L	-	-	-	ND(50)	-	-	ND(5.0)
Benzene	ug/L	-	-	-	230	-	-	150
Bromodichloromethane	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Bromoform	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Bromomethane	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Carbon disulfide	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Carbon tetrachloride	ug/L	-	-	-	ND(10)	-	-	ND(1 0)
Chlorobenzene	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Chlorobromomethane	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Chloroethane	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Chloroform	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Chloromethane	ug/L	-	-	-	ND(10)	-	-	ND(1 0)
cis-1,2-Dichloroethene	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	-	-	ND(10)	-	-	ND(1 0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	-	ND(10)	-	-	1.7
Methylene chloride	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Styrene	ug/L	-	-	-	11	-	-	8.5
Tetrachloroethene	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Toluene	ug/L	-	-	-	99	-	-	70
trans-1,2-Dichloroethene	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Trichloroethene	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Vinyl chloride	ug/L	-	-	-	ND(10)	-	-	ND(1.0)
Xylene (total)	ug/L	-	-	-	55	-	-	41
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
1,2-Dichlorobenzene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
1,3-Dichlorobenzene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
1,4-Dichlorobenzene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
2,4,5-Trichlorophenol	ug/L	-	-	-	ND(2500)	-	-	ND(1300)
2,4,6-Trichlorophenol	ug/L	-	-	-	ND(1000)	-	-	ND(500)
2,4-Dichlorophenol	ug/L	-	-	-	ND(1000)	-	-	ND(500)
2,4-Dimethylphenol	ug/L	-	-	-	2200	-	-	1500
2,4-Dinitrophenol	ug/L	-	-	-	ND(2500)	-	-	ND(1300)
2,4-Dinitrotoluene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
2,6-Dinitrotoluene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
2-Chloronaphthalene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
2-Chlorophenol	ug/L	-	-	-	ND(1000)	-	-	ND(500)

TABLE F.4

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-101500-WP-129*	*GW-101600-WP-134*	*GW-101600-WP-145*	*GW-101700-WP-150*	*GW-101800-WP-158*	*GW-101800-WP-169*	*GW-101900-WP-183*
Sample Date:		*10/15/2000*	*10/16/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/18/2000*	*10/19/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
2-Methylphenol	ug/L	-	-	-	3400	-	-	1800
2-Nitroaniline	ug/L	-	-	-	ND(2500)	-	-	ND(1300)
2-Nitrophenol	ug/L	-	-	-	ND(1000)	-	-	ND(500)
3,3'-Dichlorobenzidine	ug/L	-	-	-	ND(1000)	-	-	ND(500)
3-Nitroaniline	ug/L	-	-	-	ND(2500)	-	-	ND(1300)
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	ND(2500)	-	-	ND(1300)
4-Bromophenyl phenyl ether	ug/L	-	-	-	ND(1000)	-	-	ND(500)
4-Chloro-3-methylphenol	ug/L	-	-	-	ND(1000)	-	-	ND(500)
4-Chloroaniline	ug/L	-	-	-	ND(1000)	-	-	ND(500)
4-Chlorophenyl phenyl ether	ug/L	-	-	-	ND(1000)	-	-	ND(500)
4-Methylphenol	ug/L	-	-	-	11000	-	-	5700
4-Nitroaniline	ug/L	-	-	-	ND(2500)	-	-	ND(1300)
4-Nitrophenol	ug/L	-	-	-	ND(2500)	-	-	ND(1300)
Acenaphthene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Acenaphthylene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Anthracene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Benzo(a)anthracene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Benzo(a)pyrene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Benzo(b)fluoranthene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Benzo(g,h,i)perylene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Benzo(k)fluoranthene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
bis(2-Chloroethoxy)methane	ug/L	-	-	-	ND(1000)	-	-	ND(500)
bis(2-Chloroethyl)ether	ug/L	-	-	-	ND(1000)	-	-	ND(500)
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	ND(1000)	-	-	ND(500)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Butyl benzylphthalate	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Carbazole	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Chrysene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Dibenz(a,h)anthracene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Dibenzofuran	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Diethyl phthalate	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Dimethyl phthalate	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Di-n-butylphthalate	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Di-n-octyl phthalate	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Fluoranthene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Fluorene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Hexachlorobenzene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Hexachlorobutadiene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Hexachlorocyclopentadiene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Hexachloroethane	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Isophorone	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Naphthalene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Nitrobenzene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
N-Nitrosodi-n-propylamine	ug/L	-	-	-	ND(1000)	-	-	ND(500)
N-Nitrosodiphenylamine	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Pentachlorophenol	ug/L	-	-	-	ND(2500)	-	-	ND(1300)
Phenanthrene	ug/L	-	-	-	ND(1000)	-	-	ND(500)
Phenol	ug/L	-	-	-	6000	-	-	2200
Pyrene	ug/L	-	-	-	ND(1000)	-	-	ND(500)

GROUNDWATER ANALY. _AL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-101500-WP-129*	*GW-101600-WP-134*	*GW-101600-WP-145*	*GW-101700-WP-150*	*GW-101800-WP-158*	*GW-101800-WP-169*	*GW-101900-WP-183*
Sample Date:		10/15/2000	10/16/2000	10/16/2000	10/17/2000	10/18/2000	10/18/2000	10/19/2000
Parameter	*Unit*							
Metals								
Arsenic	ug/L	6700	4700	4000	2900	2300	2200	1800
General Chemistry								
Ammonia	mg/L	290	200	95	110	120 J	110	96
Cyanide (total)	mg/L	-	-	-	0.12	-	-	0.059
Phenolics (Total)	mg/L	220 J	65 J	38	29	21	24	17
Thiocyanate	mg/L	-	-	-	200	-	-	230

TABLE F.4

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-102000-WP-193*	*GW-102100-WP-199*	*GW-102200-WP-213*	*GW-102500-WP-254*	*GW-102700-WP-292*	*GW-102900-WP-330*	*GW-103100-WP-374*
Sample Date:		*10/20/2000*	*10/21/2000*	*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
1,1,2,2-Tetrachloroethane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
1,1,2-Trichloroethane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
1,1-Dichloroethane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
1,1-Dichloroethene	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
1,2-Dichloroethane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
1,2-Dichloropropane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
2-Butanone	ug/L	-	ND(50)	-	-	-	ND(5.0)	-
2-Hexanone	ug/L	-	ND(50)	-	-	-	ND(5.0)	-
4-Methyl-2-pentanone	ug/L	-	ND(50)	-	-	-	ND(5.0)	-
Acetone	ug/L	-	ND(50)	-	-	-	ND(5.0)	-
Benzene	ug/L	-	160	-	-	-	79	-
Bromodichloromethane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Bromoform	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Bromomethane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Carbon disulfide	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Carbon tetrachloride	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Chlorobenzene	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Chlorobromomethane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Chloroethane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Chloroform	ug/L	-	ND(10)	-	-	-	1.8	-
Chloromethane	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
cis-1,2-Dichloroethene	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
cis-1,3-Dichloropropene	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	ND(10)	-	-	-	1.4	-
Methylene chloride	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Styrene	ug/L	-	ND(10)	-	-	-	6.9	-
Tetrachloroethene	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Toluene	ug/L	-	73	-	-	-	60	-
trans-1,2-Dichloroethene	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
trans-1,3-Dichloropropene	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Trichloroethene	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Vinyl chloride	ug/L	-	ND(10)	-	-	-	ND(1.0)	-
Xylene (total)	ug/L	-	44	-	-	-	35	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	ND(500)	-	-	-	ND(500)	-
1,2-Dichlorobenzene	ug/L	-	ND(500)	-	-	-	ND(500)	-
1,3-Dichlorobenzene	ug/L	-	ND(500)	-	-	-	ND(500)	-
1,4-Dichlorobenzene	ug/L	-	ND(500)	-	-	-	ND(500)	-
2,4,5-Trichlorophenol	ug/L	-	ND(1300)	-	-	-	ND(1300)	-
2,4,6-Trichlorophenol	ug/L	-	ND(500)	-	-	-	ND(500)	-
2,4-Dichlorophenol	ug/L	-	ND(500)	-	-	-	ND(500)	-
2,4-Dimethylphenol	ug/L	-	1200	-	-	-	970	-
2,4-Dinitrophenol	ug/L	-	ND(1300)	-	-	-	ND(1300)	-
2,4-Dinitrotoluene	ug/L	-	ND(500)	-	-	-	ND(500)	-
2,6-Dinitrotoluene	ug/L	-	ND(500)	-	-	-	ND(500)	-
2-Chloronaphthalene	ug/L	-	ND(500)	-	-	-	ND(500)	-
2-Chlorophenol	ug/L	-	ND(500)	-	-	-	ND(500)	

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-102000-WP-193*	*GW-102100-WP-199*	*GW-102200-WP-213*	*GW-102500-WP-254*	*GW-102700-WP-292*	*GW-102900-WP-330*	*GW-103100-WP-374*
Sample Date:		*10/20/2000*	*10/21/2000*	*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	ND(500)	-	-	-	ND(500)	-
2-Methylphenol	ug/L	-	1300	-	-	-	800	-
2-Nitroaniline	ug/L	-	ND(1300)	-	-	-	ND(1300)	-
2-Nitrophenol	ug/L	-	ND(500)	-	-	-	ND(500)	-
3,3'-Dichlorobenzidine	ug/L	-	ND(500)	-	-	-	ND(500)	-
3-Nitroaniline	ug/L	-	ND(1300)	-	-	-	ND(1300)	-
4,6-Dinitro-2-methylphenol	ug/L	-	ND(1300)	-	-	-	ND(1300)	-
4-Bromophenyl phenyl ether	ug/L	-	ND(500)	-	-	-	ND(500)	-
4-Chloro-3-methylphenol	ug/L	-	ND(500)	-	-	-	ND(500)	-
4-Chloroaniline	ug/L	-	ND(500)	-	-	-	ND(500)	-
4-Chlorophenyl phenyl ether	ug/L	-	ND(500)	-	-	-	ND(500)	-
4-Methylphenol	ug/L	-	3600	-	-	-	2500	-
4-Nitroaniline	ug/L	-	ND(1300)	-	-	-	ND(1300)	-
4-Nitrophenol	ug/L	-	ND(1300)	-	-	-	ND(1300)	-
Acenaphthene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Acenaphthylene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Anthracene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Benzo(a)anthracene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Benzo(a)pyrene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Benzo(b)fluoranthene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Benzo(g,h,i)perylene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Benzo(k)fluoranthene	ug/L	-	ND(500)	-	-	-	ND(500)	-
bis(2-Chloroethoxy)methane	ug/L	-	ND(500)	-	-	-	ND(500)	-
bis(2-Chloroethyl)ether	ug/L	-	ND(500)	-	-	-	ND(500)	-
bis(2-Chloroisopropyl)ether	ug/L	-	ND(500)	-	-	-	ND(500)	-
bis(2-Ethylhexyl)phthalate	ug/L	-	ND(500)	-	-	-	ND(500)	-
Butyl benzylphthalate	ug/L	-	ND(500)	-	-	-	ND(500)	-
Carbazole	ug/L	-	ND(500)	-	-	-	ND(500)	-
Chrysene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Dibenz(a,h)anthracene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Dibenzofuran	ug/L	-	ND(500)	-	-	-	ND(500)	-
Diethyl phthalate	ug/L	-	ND(500)	-	-	-	ND(500)	-
Dimethyl phthalate	ug/L	-	ND(500)	-	-	-	ND(500)	-
Di-n-butylphthalate	ug/L	-	ND(500)	-	-	-	ND(500)	-
Di-n-octyl phthalate	ug/L	-	ND(500)	-	-	-	ND(500)	-
Fluoranthene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Fluorene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Hexachlorobenzene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Hexachlorobutadiene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Hexachlorocyclopentadiene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Hexachloroethane	ug/L	-	ND(500)	-	-	-	ND(500)	-
Indeno(1,2,3-cd)pyrene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Isophorone	ug/L	-	ND(500)	-	-	-	ND(500)	-
Naphthalene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Nitrobenzene	ug/L	-	ND(500)	-	-	-	ND(500)	-
N-Nitrosodi-n-propylamine	ug/L	-	ND(500)	-	-	-	ND(500)	-
N-Nitrosodiphenylamine	ug/L	-	ND(500)	-	-	-	ND(500)	-
Pentachlorophenol	ug/L	-	ND(1300)	-	-	-	ND(1300)	-
Phenanthrene	ug/L	-	ND(500)	-	-	-	ND(500)	-
Phenol	ug/L	-	1300	-	-	-	1200	-
Pyrene	ug/L	-	ND(500)	-	-	-	ND(500)	-

TABLE F.4

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-102000-WP-193*	*GW-102100-WP-199*	*GW-102200-WP-213*	*GW-102500-WP-254*	*GW-102700-WP-292*	*GW-102900-WP-330*	*GW-103100-WP-374*
Sample Date:		*10/20/2000*	*10/21/2000*	*10/22/2000*	*10/25/2000*	*10/27/2000*	*10/29/2000*	*10/31/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	1600	1400	1200	1200	1100	1000	860
General Chemistry								
Ammonia	mg/L	83	70	51	61	63	59	58
Cyanide (total)	mg/L	-	0.042 J	-	-	-	0.037	-
Phenolics (Total)	mg/L	8 8	7.2	6.2	8.1	9.3	4.5	4.3
Thiocyanate	mg/L	-	70	-	-	-	78	-

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-110200-WP-407*	*GW-110600-WP-474*	*GW-110800-WP-492*	*GW-111000-WP-519*	*GW-111300-WP-565*	*GW-111500-WP-592*	*GW-112000-WP-671*
Sample Date:		*11/2/2000*	*11/6/2000*	*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	ND(1.0)	-	-	-	-	-
1,1,2,2-Tetrachloroethane	ug/L	-	ND(1.0)	-	-	-	-	-
1,1,2-Trichloroethane	ug/L	-	ND(1.0)	-	-	-	-	-
1,1-Dichloroethane	ug/L	-	ND(1.0)	-	-	-	-	-
1,1-Dichloroethene	ug/L	-	ND(1.0)	-	-	-	-	-
1,2-Dichloroethane	ug/L	-	ND(1.0)	-	-	-	-	-
1,2-Dichloropropane	ug/L	-	ND(1.0)	-	-	-	-	-
2-Butanone	ug/L	-	ND(5.0)	-	-	-	-	-
2-Hexanone	ug/L	-	ND(5.0)	-	-	-	-	-
4-Methyl-2-pentanone	ug/L	-	ND(5.0)	-	-	-	-	-
Acetone	ug/L	-	ND(5.0)	-	-	-	-	-
Benzene	ug/L	-	52 J	-	-	-	-	-
Bromodichloromethane	ug/L	-	ND(1.0)	-	-	-	-	-
Bromoform	ug/L	-	ND(1.0)	-	-	-	-	-
Bromomethane	ug/L	-	ND(1.0)	-	-	-	-	-
Carbon disulfide	ug/L	-	ND(1.0)	-	-	-	-	-
Carbon tetrachloride	ug/L	-	ND(1.0)	-	-	-	-	-
Chlorobenzene	ug/L	-	ND(1.0) UJ	-	-	-	-	-
Chlorobromomethane	ug/L	-	ND(1.0)	-	-	-	-	-
Chloroethane	ug/L	-	ND(1.0)	-	-	-	-	-
Chloroform	ug/L	-	2.4	-	-	-	-	-
Chloromethane	ug/L	-	ND(1.0)	-	-	-	-	-
cis-1,2-Dichloroethene	ug/L	-	ND(1.0)	-	-	-	-	-
cis-1,3-Dichloropropene	ug/L	-	ND(1.0)	-	-	-	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	1.0 J	-	-	-	-	-
Methylene chloride	ug/L	-	ND(1.0)	-	-	-	-	-
Styrene	ug/L	-	5.0	-	-	-	-	-
Tetrachloroethene	ug/L	-	ND(1.0)	-	-	-	-	-
Toluene	ug/L	-	52 J	-	-	-	-	-
trans-1,2-Dichloroethene	ug/L	-	ND(1.0)	-	-	-	-	-
trans-1,3-Dichloropropene	ug/L	-	ND(1.0)	-	-	-	-	-
Trichloroethene	ug/L	-	ND(1.0)	-	-	-	-	-
Vinyl chloride	ug/L	-	ND(1.0)	-	-	-	-	-
Xylene (total)	ug/L	-	30 J	-	-	-	-	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	ND(200)	-	-	-	-	-
1,2-Dichlorobenzene	ug/L	-	ND(200)	-	-	-	-	-
1,3-Dichlorobenzene	ug/L	-	ND(200)	-	-	-	-	-
1,4-Dichlorobenzene	ug/L	-	ND(200)	-	-	-	-	-
2,4,5-Trichlorophenol	ug/L	-	ND(500)	-	-	-	-	-
2,4,6-Trichlorophenol	ug/L	-	ND(200)	-	-	-	-	-
2,4-Dichlorophenol	ug/L	-	ND(200)	-	-	-	-	-
2,4-Dimethylphenol	ug/L	-	810	-	-	-	-	-
2,4-Dinitrophenol	ug/L	-	ND(500)	-	-	-	-	-
2,4-Dinitrotoluene	ug/L	-	ND(200)	-	-	-	-	-
2,6-Dinitrotoluene	ug/L	-	ND(200)	-	-	-	-	-
2-Chloronaphthalene	ug/L	-	ND(200)	-	-	-	-	-
2-Chlorophenol	ug/L	-	ND(200)	-	-	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-110200-WP-407*	*GW-110600-WP-474*	*GW-110800-WP-492*	*GW-111000-WP-519*	*GW-111300-WP-565*	*GW-111500-WP-592*	*GW-112000-WP-671*
Sample Date.		*11/2/2000*	*11/6/2000*	*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	ND(200)	-	-	-	-	-
2-Methylphenol	ug/L	-	470	-	-	-	-	-
2-Nitroaniline	ug/L	-	ND(500)	-	-	-	-	-
2-Nitrophenol	ug/L	-	ND(200)	-	-	-	-	-
3,3'-Dichlorobenzidine	ug/L	-	ND(200)	-	-	-	-	-
3-Nitroaniline	ug/L	-	ND(500)	-	-	-	-	-
4,6-Dinitro-2-methylphenol	ug/L	-	ND(500)	-	-	-	-	-
4-Bromophenyl phenyl ether	ug/L	-	ND(200)	-	-	-	-	-
4-Chloro-3-methylphenol	ug/L	-	ND(200)	-	-	-	-	-
4-Chloroaniline	ug/L	-	ND(200)	-	-	-	-	-
4-Chlorophenyl phenyl ether	ug/L	-	ND(200)	-	-	-	-	-
4-Methylphenol	ug/L	-	1400	-	-	-	-	-
4-Nitroaniline	ug/L	-	ND(500)	-	-	-	-	-
4-Nitrophenol	ug/L	-	ND(500)	-	-	-	-	-
Acenaphthene	ug/L	-	ND(200)	-	-	-	-	-
Acenaphthylene	ug/L	-	ND(200)	-	-	-	-	-
Anthracene	ug/L	-	ND(200)	-	-	-	-	-
Benzo(a)anthracene	ug/L	-	ND(200)	-	-	-	-	-
Benzo(a)pyrene	ug/L	-	ND(200)	-	-	-	-	-
Benzo(b)fluoranthene	ug/L	-	ND(200)	-	-	-	-	-
Benzo(g,h,i)perylene	ug/L	-	ND(200)	-	-	-	-	-
Benzo(k)fluoranthene	ug/L	-	ND(200)	-	-	-	-	-
bis(2-Chloroethoxy)methane	ug/L	-	ND(200)	-	-	-	-	-
bis(2-Chloroethyl)ether	ug/L	-	ND(200)	-	-	-	-	-
bis(2-Chloroisopropyl)ether	ug/L	-	ND(200)	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	ug/L	-	ND(200)	-	-	-	-	-
Butyl benzylphthalate	ug/L	-	ND(200)	-	-	-	-	-
Carbazole	ug/L	-	ND(200)	-	-	-	-	-
Chrysene	ug/L	-	ND(200)	-	-	-	-	-
Dibenz(a,h)anthracene	ug/L	-	ND(200)	-	-	-	-	-
Dibenzofuran	ug/L	-	ND(200)	-	-	-	-	-
Diethyl phthalate	ug/L	-	ND(200)	-	-	-	-	-
Dimethyl phthalate	ug/L	-	ND(200)	-	-	-	-	-
Di-n-butylphthalate	ug/L	-	ND(200)	-	-	-	-	-
Di-n-octyl phthalate	ug/L	-	ND(200)	-	-	-	-	-
Fluoranthene	ug/L	-	ND(200)	-	-	-	-	-
Fluorene	ug/L	-	ND(200)	-	-	-	-	-
Hexachlorobenzene	ug/L	-	ND(200)	-	-	-	-	-
Hexachlorobutadiene	ug/L	-	ND(200)	-	-	-	-	-
Hexachlorocyclopentadiene	ug/L	-	ND(200)	-	-	-	-	-
Hexachloroethane	ug/L	-	ND(200)	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	ug/L	-	ND(200)	-	-	-	-	-
Isophorone	ug/L	-	ND(200)	-	-	-	-	-
Naphthalene	ug/L	-	ND(200)	-	-	-	-	-
Nitrobenzene	ug/L	-	ND(200)	-	-	-	-	-
N-Nitrosodi-n-propylamine	ug/L	-	ND(200)	-	-	-	-	-
N-Nitrosodiphenylamine	ug/L	-	ND(200)	-	-	-	-	-
Pentachlorophenol	ug/L	-	ND(500)	-	-	-	-	-
Phenanthrene	ug/L	-	ND(200)	-	-	-	-	-
Phenol	ug/L	-	570	-	-	-	-	-
Pyrene	ug/L	-	ND(200)	-	-	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*	*WN-1D*
Sample ID:		*GW-110200-WP-407*	*GW-110600-WP-474*	*GW-110800-WP-492*	*GW-111000-WP-519*	*GW-111300-WP-565*	*GW-111500-WP-592*	*GW-112000-WP-671*
Sample Date:		*11/2/2000*	*11/6/2000*	*11/8/2000*	*11/10/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	1600	730	630	560	420	490	350
General Chemistry								
Ammonia	mg/L	80	60	55	55	58	45	55
Cyanide (total)	mg/L	-	ND(0.010)	-	-	-	-	-
Phenolics (Total)	mg/L	16	4.0	3.2	1.8	1.6	1.5	1.3
Thiocyanate	mg/L	-	8.2	-	-	-	-	-

TABLE F.4

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*
Sample ID:		*GW-112700-WP-697*	*GW-121800-WP-702*
Sample Date:		*11/27/2000*	*12/18/2000*
Parameter	***Unit***		
Volatiles			
1,1,1-Trichloroethane	ug/L	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(1.0)	ND(1.0)
1,1-Dichloroethane	ug/L	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1 0)	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)	ND(1 0)
2-Butanone	ug/L	ND(5.0)	ND(5.0)
2-Hexanone	ug/L	ND(5.0)	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(5.0)	ND(5.0)
Acetone	ug/L	ND(5.0)	ND(5.0)
Benzene	ug/L	22	16
Bromodichloromethane	ug/L	ND(1.0)	ND(1.0)
Bromoform	ug/L	ND(1.0)	ND(1.0)
Bromomethane	ug/L	ND(1.0)	ND(1.0)
Carbon disulfide	ug/L	ND(1.0)	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)	ND(1 0)
Chlorobromomethane	ug/L	ND(1.0)	-
Chloroethane	ug/L	ND(1.0)	ND(1.0)
Chloroform	ug/L	2.6	1.5
Chloromethane	ug/L	ND(1 0)	ND(1.0)
cis-1,2-Dichloroethene	ug/L	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(1 0)	ND(1.0)
Dibromochloromethane	ug/L	-	ND(1.0)
Ethylbenzene	ug/L	1 1	ND(1.0)
Methylene chloride	ug/L	ND(1.0)	ND(1.0)
Styrene	ug/L	5.2	3.7
Tetrachloroethene	ug/L	ND(1.0)	ND(1.0)
Toluene	ug/L	49	48
trans-1,2-Dichloroethene	ug/L	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(1 0)	ND(1.0)
Trichloroethene	ug/L	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	ND(1.0)	ND(2.0)
Xylene (total)	ug/L	28	20
Semi - Volatiles			
1,2,4-Trichlorobenzene	ug/L	ND(100)	ND(50)
1,2-Dichlorobenzene	ug/L	ND(100)	ND(50)
1,3-Dichlorobenzene	ug/L	ND(100)	ND(50)
1,4-Dichlorobenzene	ug/L	ND(100)	ND(50)
2,4,5-Trichlorophenol	ug/L	ND(250)	ND(130)
2,4,6-Trichlorophenol	ug/L	ND(100)	ND(50)
2,4-Dichlorophenol	ug/L	ND(100)	ND(50)
2,4-Dimethylphenol	ug/L	*560*	*660*
2,4-Dinitrophenol	ug/L	ND(250)	ND(130)
2,4-Dinitrotoluene	ug/L	ND(100)	ND(50)
2,6-Dinitrotoluene	ug/L	ND(100)	ND(50)
2-Chloronaphthalene	ug/L	ND(100)	ND(50)
2-Chlorophenol	ug/L	ND(100)	ND(50)

GROUNDWATER ANAL. CAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*
Sample ID:		*GW-112700-WP-697*	*GW-121800-WP-702*
Sample Date.		*11/27/2000*	*12/18/2000*
Parameter	*Unit*		
2-Methyl naphthalene	ug/L	ND(100)	ND(50)
2-Methylphenol	ug/L	230	290
2-Nitroaniline	ug/L	ND(250)	ND(130)
2-Nitrophenol	ug/L	ND(100)	ND(50)
3,3'-Dichlorobenzidine	ug/L	ND(100)	ND(50)
3-Nitroaniline	ug/L	ND(250)	ND(130)
4,6-Dinitro-2-methylphenol	ug/L	ND(250)	ND(130)
4-Bromophenyl phenyl ether	ug/L	ND(100)	ND(50)
4-Chloro-3-methylphenol	ug/L	ND(100)	ND(50)
4-Chloroaniline	ug/L	ND(100)	ND(50)
4-Chlorophenyl phenyl ether	ug/L	ND(100)	ND(50)
4-Methylphenol	ug/L	670	790
4-Nitroaniline	ug/L	ND(250)	ND(130)
4-Nitrophenol	ug/L	ND(250)	ND(130)
Acenaphthene	ug/L	ND(100)	ND(50)
Acenaphthylene	ug/L	ND(100)	ND(50)
Anthracene	ug/L	ND(100)	ND(50)
Benzo(a)anthracene	ug/L	ND(100)	ND(50)
Benzo(a)pyrene	ug/L	ND(100)	ND(50)
Benzo(b)fluoranthene	ug/L	ND(100)	ND(50)
Benzo(g,h,i)perylene	ug/L	ND(100)	ND(50)
Benzo(k)fluoranthene	ug/L	ND(100)	ND(50)
bis(2-Chloroethoxy)methane	ug/L	ND(100)	ND(50)
bis(2-Chloroethyl)ether	ug/L	ND(100)	ND(50)
bis(2-Chloroisopropyl)ether	ug/L	ND(100)	ND(50)
bis(2-Ethylhexyl)phthalate	ug/L	ND(100)	ND(50)
Butyl benzylphthalate	ug/L	ND(100)	ND(50)
Carbazole	ug/L	ND(100)	ND(50)
Chrysene	ug/L	ND(100)	ND(50)
Dibenz(a,h)anthracene	ug/L	ND(100)	ND(50)
Dibenzofuran	ug/L	ND(100)	ND(50)
Diethyl phthalate	ug/L	ND(100)	ND(50)
Dimethyl phthalate	ug/L	ND(100)	ND(50)
Di-n-butylphthalate	ug/L	ND(100)	ND(50)
Di-n-octyl phthalate	ug/L	ND(100)	ND(50)
Fluoranthene	ug/L	ND(100)	ND(50)
Fluorene	ug/L	ND(100)	ND(50)
Hexachlorobenzene	ug/L	ND(100)	ND(50)
Hexachlorobutadiene	ug/L	ND(100)	ND(50)
Hexachlorocyclopentadiene	ug/L	ND(100)	ND(50)
Hexachloroethane	ug/L	ND(100)	ND(50)
Indeno(1,2,3-cd)pyrene	ug/L	ND(100)	ND(50)
Isophorone	ug/L	ND(100)	ND(50)
Naphthalene	ug/L	140	130
Nitrobenzene	ug/L	ND(100)	ND(50)
N-Nitrosodi-n-propylamine	ug/L	ND(100)	ND(50)
N-Nitrosodiphenylamine	ug/L	ND(100)	ND(50)
Pentachlorophenol	ug/L	ND(250)	ND(130)
Phenanthrene	ug/L	ND(100)	ND(50)
Phenol	ug/L	240	420
Pyrene	ug/L	ND(100)	ND(50)

TABLE F.4

GROUNDWATER ANALYTICAL RESULTS - WN-1D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1D*	*WN-1D*
Sample ID:		*GW-112700-WP-697*	*GW-121800-WP-702*
Sample Date:		*11/27/2000*	*12/18/2000*
Parameter	*Unit*		
Metals			
Arsenic	ug/L	510	670
General Chemistry			
Ammonia	mg/L	60	61
Cyanide (total)	mg/L	0.068 J	0.061
Phenolics (Total)	mg/L	2.1	2.0
Thiocyanate	mg/L	180	11

TABLE F.5

GROUNDWATER ANAL. .CAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-100900-WP-037*	*GW-100900-WP-049*	*GW-101000-WP-054*	*GW-101000-WP-059*	*GW-101100-WP-064*	*GW-101100-WP-077*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/9/2000*	*10/10/2000*	*10/10/2000*	*10/11/2000*	*10/11/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
1,1,2-Trichloroethane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
1,1-Dichloroethane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
1,1-Dichloroethene	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
1,2-Dichloroethane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
1,2-Dichloropropane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
2-Butanone	ug/L	110	-	-	97	-	-	-
2-Hexanone	ug/L	ND(50)	-	-	ND(25)	-	-	-
4-Methyl-2-pentanone	ug/L	ND(50)	-	-	ND(25)	-	-	-
Acetone	ug/L	550	-	-	490	-	-	-
Benzene	ug/L	910	-	-	920	-	-	-
Bromodichloromethane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Bromoform	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Bromomethane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Carbon disulfide	ug/L	11	-	-	ND(5.0)	-	-	-
Carbon tetrachloride	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Chlorobenzene	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Chlorobromomethane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Chloroethane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Chloroform	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Chloromethane	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
cis-1,2-Dichloroethene	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
cis-1,3-Dichloropropene	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(10)	-	-	8.0	-	-	-
Methylene chloride	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Styrene	ug/L	42	-	-	41	-	-	-
Tetrachloroethene	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Toluene	ug/L	270	-	-	290	-	-	-
trans-1,2-Dichloroethene	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
trans-1,3-Dichloropropene	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Trichloroethene	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Vinyl chloride	ug/L	ND(10)	-	-	ND(5.0)	-	-	-
Xylene (total)	ug/L	180	-	-	180	-	-	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
1,2-Dichlorobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
1,3-Dichlorobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
1,4-Dichlorobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2,4,5-Trichlorophenol	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
2,4,6-Trichlorophenol	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2,4-Dichlorophenol	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2,4-Dimethylphenol	ug/L	19000	-	-	ND(30000)	-	-	-
2,4-Dinitrophenol	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
2,4-Dinitrotoluene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2,6-Dinitrotoluene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2-Chloronaphthalene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2-Chlorophenol	ug/L	ND(5000)	-	-	ND(30000)	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-100900-WP-037*	*GW-100900-WP-049*	*GW-101000-WP-054*	*GW-101000-WP-059*	*GW-101100-WP-064*	*GW-101100-WP-077*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/9/2000*	*10/10/2000*	*10/10/2000*	*10/11/2000*	*10/11/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
2-Methylphenol	ug/L	47000	-	-	100000	-	-	-
2-Nitroaniline	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
2-Nitrophenol	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
3,3'-Dichlorobenzidine	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
3-Nitroaniline	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
4-Bromophenyl phenyl ether	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
4-Chloro-3-methylphenol	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
4-Chloroaniline	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
4-Methylphenol	ug/L	110000	-	-	270000	-	-	-
4-Nitroaniline	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
4-Nitrophenol	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
Acenaphthene	ug/L	ND(5000) UJ	-	-	ND(30000)	-	-	-
Acenaphthylene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Anthracene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Benzo(a)anthracene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Benzo(a)pyrene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Benzo(b)fluoranthene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Benzo(g,h,i)perylene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Benzo(k)fluoranthene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
bis(2-Chloroethyl)ether	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Butyl benzylphthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Carbazole	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Chrysene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Dibenz(a,h)anthracene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Dibenzofuran	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Diethyl phthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Dimethyl phthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Di-n-butylphthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Di-n-octyl phthalate	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Fluoranthene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Fluorene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Hexachlorobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Hexachlorobutadiene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Hexachlorocyclopentadiene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Hexachloroethane	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Isophorone	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Naphthalene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Nitrobenzene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
N-Nitrosodiphenylamine	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Pentachlorophenol	ug/L	ND(13000)	-	-	ND(75000)	-	-	-
Phenanthrene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-
Phenol	ug/L	160000	-	-	370000	-	-	-
Pyrene	ug/L	ND(5000)	-	-	ND(30000)	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-100900-WP-037*	*GW-100900-WP-049*	*GW-101000-WP-054*	*GW-101000-WP-059*	*GW-101100-WP-064*	*GW-101100-WP-077*
Sample Date:		*10/8/2000*	*10/9/2000*	*10/9/2000*	*10/10/2000*	*10/10/2000*	*10/11/2000*	*10/11/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	18000	17000	14000	30000	27000	22000	25000
General Chemistry								
Ammonia	mg/L	1700	2200	2400	250	1500	2200	1500
Cyanide (total)	mg/L	1.3 J	-	-	1.7	-	-	-
Phenolics (Total)	mg/L	1500	1700	1300	2000	1600	1600	1600
Thiocyanate	mg/L	8400	-	-	5100	-	-	-

TABLE F.5

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-101200-WP-082*	*GW-101200-WP-087*	*GW-101300-WP-092*	*GW-101300-WP-102*	*GW-101400-WP-107*	*GW-101400-WP-115*
Sample Date:		*10/8/2000*	*10/12/2000*	*10/12/2000*	*10/13/2000*	*10/13/2000*	*10/14/2000*	*10/14/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
1,1,2-Trichloroethane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
1,1-Dichloroethane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
1,1-Dichloroethene	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
1,2-Dichloroethane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
1,2-Dichloropropane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
2-Butanone	ug/L	110	97	-	-	-	ND(50)	-
2-Hexanone	ug/L	ND(50)	ND(50)	-	-	-	ND(50)	-
4-Methyl-2-pentanone	ug/L	ND(50)	ND(50)	-	-	-	ND(50)	-
Acetone	ug/L	550	580	-	-	-	72	-
Benzene	ug/L	910	940	-	-	-	290	-
Bromodichloromethane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Bromoform	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Bromomethane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Carbon disulfide	ug/L	11	ND(10)	-	-	-	ND(10)	-
Carbon tetrachloride	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Chlorobenzene	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Chlorobromomethane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Chloroethane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Chloroform	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Chloromethane	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
cis-1,2-Dichloroethene	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
cis-1,3-Dichloropropene	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Methylene chloride	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Styrene	ug/L	42	39	-	-	-	ND(10)	-
Tetrachloroethene	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Toluene	ug/L	270	280	-	-	-	85	-
trans-1,2-Dichloroethene	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
trans-1,3-Dichloropropene	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Trichloroethene	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Vinyl chloride	ug/L	ND(10)	ND(10)	-	-	-	ND(10)	-
Xylene (total)	ug/L	180	130	-	-	-	34	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
1,2-Dichlorobenzene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
1,3-Dichlorobenzene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
1,4-Dichlorobenzene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
2,4,5-Trichlorophenol	ug/L	ND(13000)	ND(2500)	-	-	-	ND(13000)	-
2,4,6-Trichlorophenol	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
2,4-Dichlorophenol	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
2,4-Dimethylphenol	ug/L	19000	5300	-	-	-	7300	-
2,4-Dinitrophenol	ug/L	ND(13000)	ND(2500)	-	-	-	ND(13000)	-
2,4-Dinitrotoluene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
2,6-Dinitrotoluene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
2-Chloronaphthalene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
2-Chlorophenol	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	

GROUNDWATER ANAL. AL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-101200-WP-082*	*GW-101200-WP-087*	*GW-101300-WP-092*	*GW-101300-WP-102*	*GW-101400-WP-107*	*GW-101400-WP-115*
Sample Date:		*10/8/2000*	*10/12/2000*	*10/12/2000*	*10/13/2000*	*10/13/2000*	*10/14/2000*	*10/14/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
2-Methylphenol	ug/L	47000	12000	-	-	-	22000	-
2-Nitroaniline	ug/L	ND(13000)	ND(2500)	-	-	-	ND(13000)	-
2-Nitrophenol	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
3,3'-Dichlorobenzidine	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
3-Nitroaniline	ug/L	ND(13000)	ND(2500)	-	-	-	ND(13000)	-
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	ND(2500)	-	-	-	ND(13000)	-
4-Bromophenyl phenyl ether	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
4-Chloro-3-methylphenol	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
4-Chloroaniline	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
4-Methylphenol	ug/L	110000	49000	-	-	-	67000	-
4-Nitroaniline	ug/L	ND(13000)	ND(2500)	-	-	-	ND(13000)	-
4-Nitrophenol	ug/L	ND(13000)	ND(2500)	-	-	-	ND(13000)	-
Acenaphthene	ug/L	ND(5000) UJ	ND(1000)	-	-	-	ND(5000)	-
Acenaphthylene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Anthracene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Benzo(a)anthracene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Benzo(a)pyrene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Benzo(b)fluoranthene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Benzo(g,h,i)perylene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Benzo(k)fluoranthene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
bis(2-Chloroethyl)ether	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Butyl benzylphthalate	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Carbazole	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Chrysene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Dibenz(a,h)anthracene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Dibenzofuran	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Diethyl phthalate	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Dimethyl phthalate	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Di-n-butylphthalate	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Di-n-octyl phthalate	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Fluoranthene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Fluorene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Hexachlorobenzene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Hexachlorobutadiene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Hexachlorocyclopentadiene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Hexachloroethane	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Isophorone	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Naphthalene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Nitrobenzene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
N-Nitrosodiphenylamine	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Pentachlorophenol	ug/L	ND(13000)	ND(2500)	-	-	-	ND(13000)	-
Phenanthrene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-
Phenol	ug/L	160000	71000	-	-	-	80000	-
Pyrene	ug/L	ND(5000)	ND(1000)	-	-	-	ND(5000)	-

TABLE F.5

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-101200-WP-082*	*GW-101200-WP-087*	*GW-101300-WP-092*	*GW-101300-WP-102*	*GW-101400-WP-107*	*GW-101400-WP-115*
Sample Date:		*10/8/2000*	*10/12/2000*	*10/12/2000*	*10/13/2000*	*10/13/2000*	*10/14/2000*	*10/14/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	18000	-	28000	20000	16000	13000	9400
General Chemistry								
Ammonia	mg/L	1700	2200	1200	830	360	340	470
Cyanide (total)	mg/L	1.3 J	1.2	-	-	-	0.15	-
Phenolics (Total)	mg/L	1500	1800	1200	650	350	370	230 J
Thiocyanate	mg/L	8400	7000	-	-	-	82	-

GROUNDWATER ANAL. .AL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-101500-WP-120*	*GW-101600-WP-135*	*GW-101600-WP-146*	*GW-101700-WP-151*	*GW-101800-WP-159*	*GW-101800-WP-170*
Sample Date:		*10/8/2000*	*10/15/2000*	*10/16/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/18/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,1,2-Trichloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,1-Dichloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,1-Dichloroethene	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,2-Dichloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
1,2-Dichloropropane	ug/L	ND(10)	-	-	-	ND(10)	-	-
2-Butanone	ug/L	110	-	-	-	ND(50)	-	-
2-Hexanone	ug/L	ND(50)	-	-	-	ND(50)	-	-
4-Methyl-2-pentanone	ug/L	ND(50)	-	-	-	ND(50)	-	-
Acetone	ug/L	550	-	-	-	ND(50)	-	-
Benzene	ug/L	910	-	-	-	190	-	-
Bromodichloromethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
Bromoform	ug/L	ND(10)	-	-	-	ND(10)	-	-
Bromomethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
Carbon disulfide	ug/L	11	-	-	-	ND(10)	-	-
Carbon tetrachloride	ug/L	ND(10)	-	-	-	ND(10)	-	-
Chlorobenzene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Chlorobromomethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
Chloroethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
Chloroform	ug/L	ND(10)	-	-	-	ND(10)	-	-
Chloromethane	ug/L	ND(10)	-	-	-	ND(10)	-	-
cis-1,2-Dichloroethene	ug/L	ND(10)	-	-	-	ND(10)	-	-
cis-1,3-Dichloropropene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Methylene chloride	ug/L	ND(10)	-	-	-	ND(10)	-	-
Styrene	ug/L	42	-	-	-	ND(10)	-	-
Tetrachloroethene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Toluene	ug/L	270	-	-	-	63	-	-
trans-1,2-Dichloroethene	ug/L	ND(10)	-	-	-	ND(10)	-	-
trans-1,3-Dichloropropene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Trichloroethene	ug/L	ND(10)	-	-	-	ND(10)	-	-
Vinyl chloride	ug/L	ND(10)	-	-	-	ND(10)	-	-
Xylene (total)	ug/L	180	-	-	-	24	-	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
1,2-Dichlorobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
1,3-Dichlorobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
1,4-Dichlorobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
2,4,5-Trichlorophenol	ug/L	ND(13000)	-	-	-	ND(5000)	-	-
2,4,6-Trichlorophenol	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
2,4-Dichlorophenol	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
2,4-Dimethylphenol	ug/L	19000	-	-	-	ND(2000)	-	-
2,4-Dinitrophenol	ug/L	ND(13000)	-	-	-	ND(5000)	-	-
2,4-Dinitrotoluene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
2,6-Dinitrotoluene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
2-Chloronaphthalene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
2-Chlorophenol	ug/L	ND(5000)	-	-	-	ND(2000)	-	-

TABLE F.5

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-101500-WP-120*	*GW-101600-WP-135*	*GW-101600-WP-146*	*GW-101700-WP-151*	*GW-101800-WP-159*	*GW-101800-WP-170*
Sample Date:		*10/8/2000*	*10/15/2000*	*10/16/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/18/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
2-Methylphenol	ug/L	47000	-	-	-	4400	-	-
2-Nitroaniline	ug/L	ND(13000)	-	-	-	ND(5000)	-	-
2-Nitrophenol	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
3,3'-Dichlorobenzidine	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
3-Nitroaniline	ug/L	ND(13000)	-	-	-	ND(5000)	-	-
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	-	-	-	ND(5000)	-	-
4-Bromophenyl phenyl ether	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
4-Chloro-3-methylphenol	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
4-Chloroaniline	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
4-Methylphenol	ug/L	110000	-	-	-	15000	-	-
4-Nitroaniline	ug/L	ND(13000)	-	-	-	ND(5000)	-	-
4-Nitrophenol	ug/L	ND(13000)	-	-	-	ND(5000)	-	-
Acenaphthene	ug/L	ND(5000) UJ	-	-	-	ND(2000)	-	-
Acenaphthylene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Anthracene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Benzo(a)anthracene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Benzo(a)pyrene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Benzo(b)fluoranthene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Benzo(g,h,i)perylene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Benzo(k)fluoranthene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
bis(2-Chloroethyl)ether	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Butyl benzylphthalate	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Carbazole	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Chrysene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Dibenz(a,h)anthracene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Dibenzofuran	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Diethyl phthalate	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Dimethyl phthalate	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Di-n-butylphthalate	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Di-n-octyl phthalate	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Fluoranthene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Fluorene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Hexachlorobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Hexachlorobutadiene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Hexachlorocyclopentadiene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Hexachloroethane	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Isophorone	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Naphthalene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Nitrobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
N-Nitrosodiphenylamine	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Pentachlorophenol	ug/L	ND(13000)	-	-	-	ND(5000)	-	-
Phenanthrene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-
Phenol	ug/L	160000	-	-	-	17000	-	-
Pyrene	ug/L	ND(5000)	-	-	-	ND(2000)	-	-

GROUNDWATER ANAL. .AL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		WN-1E	WN-1E	WN-1E	WN-1E	WN-1E	WN-1E	WN-1E
Sample ID:		*GW-100800-WP-025*	*GW-101500-WP-120*	*GW-101600-WP-135*	*GW-101600-WP-146*	*GW-101700-WP-151*	*GW-101800-WP-159*	*GW-101800-WP-170*
Sample Date:		*10/8/2000*	*10/15/2000*	*10/16/2000*	*10/16/2000*	*10/17/2000*	*10/18/2000*	*10/18/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	18000	8200	5900	5100	5200	4000	4200
General Chemistry								
Ammonia	mg/L	1700	280	240	170	170	170 J	170
Cyanide (total)	mg/L	1.3 J	-	-	-	0.17	-	-
Phenolics (Total)	mg/L	1500	410 J	69 J	60	60	64	790
Thiocyanate	mg/L	8400	-	-	-	400	-	-

TABLE F.5

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-101900-WP-184*	*GW-102000-WP-194*	*GW-102100-WP-200*	*GW-102200-WP-214*	*GW-102500-WP-255*	*GW-102700-WP-293*
Sample Date:		*10/8/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*	*10/22/2000*	*10/25/2000*	*10/27/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	ND(1 0)	-	ND(10)	-	-	-
1,1,2-Trichloroethane	ug/L	ND(10)	ND(1 0)	-	ND(10)	-	-	-
1,1-Dichloroethane	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
1,1-Dichloroethene	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
1,2-Dichloroethane	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
1,2-Dichloropropane	ug/L	ND(10)	ND(1 0)	-	ND(10)	-	-	-
2-Butanone	ug/L	110	5.1	-	ND(50)	-	-	-
2-Hexanone	ug/L	ND(50)	ND(5.0)	-	ND(50)	-	-	-
4-Methyl-2-pentanone	ug/L	ND(50)	ND(5.0)	-	ND(50)	-	-	-
Acetone	ug/L	550	22	-	ND(50)	-	-	-
Benzene	ug/L	910	130	-	130	-	-	-
Bromodichloromethane	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Bromoform	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Bromomethane	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Carbon disulfide	ug/L	11	ND(1.0)	-	ND(10)	-	-	-
Carbon tetrachloride	ug/L	ND(10)	ND(1 0)	-	ND(10)	-	-	-
Chlorobenzene	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Chlorobromomethane	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Chloroethane	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Chloroform	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Chloromethane	ug/L	ND(10)	ND(1 0)	-	ND(10)	-	-	-
cis-1,2-Dichloroethene	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
cis-1,3-Dichloropropene	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Methylene chloride	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Styrene	ug/L	42	5.9	-	ND(10)	-	-	-
Tetrachloroethene	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Toluene	ug/L	270	44	-	49	-	-	-
trans-1,2-Dichloroethene	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
trans-1,3-Dichloropropene	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Trichloroethene	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Vinyl chloride	ug/L	ND(10)	ND(1.0)	-	ND(10)	-	-	-
Xylene (total)	ug/L	180	19	-	ND(20)	-	-	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
1,2-Dichlorobenzene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
1,3-Dichlorobenzene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
1,4-Dichlorobenzene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
2,4,5-Trichlorophenol	ug/L	ND(13000)	ND(1300)	-	ND(38000)	-	-	-
2,4,6-Trichlorophenol	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
2,4-Dichlorophenol	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
2,4-Dimethylphenol	ug/L	19000	1900	-	ND(15000)	-	-	-
2,4-Dinitrophenol	ug/L	ND(13000)	ND(1300)	-	ND(38000)	-	-	-
2,4-Dinitrotoluene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
2,6-Dinitrotoluene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
2-Chloronaphthalene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
2-Chlorophenol	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-101900-WP-184*	*GW-102000-WP-194*	*GW-102100-WP-200*	*GW-102200-WP-214*	*GW-102500-WP-255*	*GW-102700-WP-293*
Sample Date:		*10/8/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*	*10/22/2000*	*10/25/2000*	*10/27/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
2-Methylphenol	ug/L	47000	4100	-	18000	-	-	-
2-Nitroaniline	ug/L	ND(13000)	ND(1300)	-	ND(38000)	-	-	-
2-Nitrophenol	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
3,3'-Dichlorobenzidine	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
3-Nitroaniline	ug/L	ND(13000)	ND(1300)	-	ND(38000)	-	-	-
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	ND(1300)	-	ND(38000)	-	-	-
4-Bromophenyl phenyl ether	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
4-Chloro-3-methylphenol	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
4-Chloroaniline	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
4-Methylphenol	ug/L	110000	13000	-	56000	-	-	-
4-Nitroaniline	ug/L	ND(13000)	ND(1300)	-	ND(38000)	-	-	-
4-Nitrophenol	ug/L	ND(13000)	ND(1300)	-	ND(38000)	-	-	-
Acenaphthene	ug/L	ND(5000) UJ	ND(500)	-	ND(15000)	-	-	-
Acenaphthylene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Anthracene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Benzo(a)anthracene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Benzo(a)pyrene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Benzo(b)fluoranthene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Benzo(g,h,i)perylene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Benzo(k)fluoranthene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
bis(2-Chloroethyl)ether	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
bis(2-Ethylhexyl)phthalate	*ug/L*	*ND(5000)*	*ND(500)*	-	ND(15000)	-	-	-
Butyl benzylphthalate	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Carbazole	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Chrysene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Dibenz(a,h)anthracene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Dibenzofuran	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Diethyl phthalate	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Dimethyl phthalate	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Di-n-butylphthalate	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Di-n-octyl phthalate	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Fluoranthene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Fluorene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Hexachlorobenzene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Hexachlorobutadiene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Hexachlorocyclopentadiene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Hexachloroethane	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Isophorone	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Naphthalene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Nitrobenzene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
N-Nitrosodiphenylamine	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Pentachlorophenol	ug/L	ND(13000)	ND(1300)	-	ND(38000)	-	-	-
Phenanthrene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-
Phenol	ug/L	160000	14000	-	66000	-	-	-
Pyrene	ug/L	ND(5000)	ND(500)	-	ND(15000)	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-101900-WP-184*	*GW-102000-WP-194*	*GW-102100-WP-200*	*GW-102200-WP-214*	*GW-102500-WP-255*	*GW-102700-WP-293*
Sample Date:		*10/8/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*	*10/22/2000*	*10/25/2000*	*10/27/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	18000	3800	2300	3000	1700	2100	2100
General Chemistry								
Ammonia	mg/L	1700	140	91	110	61	77	68
Cyanide (total)	mg/L	1.3 J	ND(0.010)	-	ND(0.010)	-	-	-
Phenolics (Total)	mg/L	1500	72	16	27	19	18	21
Thiocyanate	mg/L	8400	12	-	88	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-102900-WP-331*	*GW-103100-WP-375*	*GW-110200-WP-408*	*GW-110600-WP-475*	*GW-110800-WP-493*	*GW-111000-WP-520*
Sample Date:		*10/8/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*	*11/6/2000*	*11/8/2000*	*11/10/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
1,1,2-Trichloroethane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
1,1-Dichloroethane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
1,1-Dichloroethene	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
1,2-Dichloroethane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
1,2-Dichloropropane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
2-Butanone	ug/L	110	ND(5.0)	-	-	ND(5.0)	-	-
2-Hexanone	ug/L	ND(50)	ND(5.0)	-	-	ND(5.0)	-	-
4-Methyl-2-pentanone	ug/L	ND(50)	ND(5.0)	-	-	ND(5.0)	-	-
Acetone	ug/L	550	17	-	-	8.9	-	-
Benzene	ug/L	910	74	-	-	46 J	-	-
Bromodichloromethane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
Bromoform	ug/L	ND(10)	ND(1.0)	-	-	ND(1 0)	-	-
Bromomethane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
Carbon disulfide	ug/L	11	ND(1.0)	-	-	ND(1.0)	-	-
Carbon tetrachloride	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
Chlorobenzene	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0) UJ	-	-
Chlorobromomethane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
Chloroethane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
Chloroform	ug/L	ND(10)	1.8	-	-	2.5	-	-
Chloromethane	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
cis-1,2-Dichloroethene	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
cis-1,3-Dichloropropene	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0) UJ	-	-
Methylene chloride	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
Styrene	ug/L	42	4.7	-	-	3.7	-	-
Tetrachloroethene	ug/L	ND(10)	ND(1.0)	-	-	ND(1 0)	-	-
Toluene	ug/L	270	36	-	-	16 J	-	-
trans-1,2-Dichloroethene	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
trans-1,3-Dichloropropene	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
Trichloroethene	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
Vinyl chloride	ug/L	ND(10)	ND(1.0)	-	-	ND(1.0)	-	-
Xylene (total)	ug/L	180	16	-	-	13 J	-	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
1,2-Dichlorobenzene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
1,3-Dichlorobenzene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
1,4-Dichlorobenzene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
2,4,5-Trichlorophenol	ug/L	ND(13000)	ND(1300)	-	-	ND(500)	-	-
2,4,6-Trichlorophenol	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
2,4-Dichlorophenol	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
2,4-Dimethylphenol	ug/L	19000	910	-	-	560	-	-
2,4-Dinitrophenol	ug/L	ND(13000)	ND(1300)	-	-	ND(500)	-	-
2,4-Dinitrotoluene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
2,6-Dinitrotoluene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
2-Chloronaphthalene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
2-Chlorophenol	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-

TABLE F.5

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-102900-WP-331*	*GW-103100-WP-375*	*GW-110200-WP-408*	*GW-110600-WP-475*	*GW-110800-WP-493*	*GW-111000-WP-520*
Sample Date.		*10/8/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*	*11/6/2000*	*11/8/2000*	*11/10/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
2-Methylphenol	ug/L	47000	1800	-	-	750	-	-
2-Nitroaniline	ug/L	ND(13000)	ND(1300)	-	-	ND(500)	-	-
2-Nitrophenol	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
3,3'-Dichlorobenzidine	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
3-Nitroaniline	ug/L	ND(13000)	ND(1300)	-	-	ND(500)	-	-
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	ND(1300)	-	-	ND(500)	-	-
4-Bromophenyl phenyl ether	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
4-Chloro-3-methylphenol	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
4-Chloroaniline	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
4-Methylphenol	ug/L	110000	5400	-	-	2000	-	-
4-Nitroaniline	ug/L	ND(13000)	ND(1300)	-	-	ND(500)	-	-
4-Nitrophenol	ug/L	ND(13000)	ND(1300)	-	-	ND(500)	-	-
Acenaphthene	ug/L	ND(5000) UJ	ND(500)	-	-	ND(200)	-	-
Acenaphthylene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Anthracene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Benzo(a)anthracene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Benzo(a)pyrene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Benzo(b)fluoranthene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Benzo(g,h,i)perylene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Benzo(k)fluoranthene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
bis(2-Chloroethyl)ether	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Butyl benzylphthalate	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Carbazole	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Chrysene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Dibenz(a,h)anthracene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Dibenzofuran	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Diethyl phthalate	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Dimethyl phthalate	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Di-n-butylphthalate	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Di-n-octyl phthalate	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Fluoranthene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Fluorene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Hexachlorobenzene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Hexachlorobutadiene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Hexachlorocyclopentadiene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Hexachloroethane	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Isophorone	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Naphthalene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Nitrobenzene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
N-Nitrosodiphenylamine	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Pentachlorophenol	ug/L	ND(13000)	ND(1300)	-	-	ND(500)	-	-
Phenanthrene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-
Phenol	ug/L	160000	6200	-	-	2100	-	-
Pyrene	ug/L	ND(5000)	ND(500)	-	-	ND(200)	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-102900-WP-331*	*GW-103100-WP-375*	*GW-110200-WP-408*	*GW-110600-WP-475*	*GW-110800-WP-493*	*GW-111000-WP-520*
Sample Date:		*10/8/2000*	*10/29/2000*	*10/31/2000*	*11/2/2000*	*11/6/2000*	*11/8/2000*	*11/10/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	18000	2000	1600	490	1700	1200	1100
General Chemistry								
Ammonia	mg/L	1700	160	84	21 J	62	42	43
Cyanide (total)	mg/L	1.3 J	0.031	-	-	ND(0.010)	-	-
Phenolics (Total)	mg/L	1500	15	18	2.6 J	19	12	9.3
Thiocyanate	mg/L	8400	280	-	-	99	-	-

TABLE F.5

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-111300-WP-566*	*GW-111500-WP-593*	*GW-112000-WP-672*	*GW-112700-WP-698*	*GW-121800-WP-703*
Sample Date:		*10/8/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*						
Volatiles							
1,1,1-Trichloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
1,1-Dichloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
1,2-Dichloropropane	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
2-Butanone	ug/L	110	-	-	-	ND(5.0)	ND(5.0)
2-Hexanone	ug/L	ND(50)	-	-	-	ND(5.0)	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(50)	-	-	-	ND(5.0)	ND(5.0)
Acetone	ug/L	550	-	-	-	8.2	25
Benzene	ug/L	910	-	-	-	34	53
Bromodichloromethane	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Bromoform	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Bromomethane	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Carbon disulfide	ug/L	11	-	-	-	ND(1.0)	ND(1.0)
Carbon tetrachloride	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Chlorobenzene	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Chlorobromomethane	ug/L	ND(10)	-	-	-	ND(1.0)	-
Chloroethane	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Chloroform	ug/L	ND(10)	-	-	-	2.7	1.7
Chloromethane	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
cis-1,2-Dichloroethene	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	ND(1.0)
Ethylbenzene	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Methylene chloride	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Styrene	ug/L	42	-	-	-	3.5	2.9
Tetrachloroethene	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Toluene	ug/L	270	-	-	-	28	37
trans-1,2-Dichloroethene	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Trichloroethene	ug/L	ND(10)	-	-	-	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	ND(10)	-	-	-	ND(1.0)	ND(2.0)
Xylene (total)	ug/L	180	-	-	-	12	10
Semi - Volatiles							
1,2,4-Trichlorobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
1,2-Dichlorobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
1,3-Dichlorobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
1,4-Dichlorobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
2,4,5-Trichlorophenol	ug/L	ND(13000)	-	-	-	ND(5000)	ND(1300)
2,4,6-Trichlorophenol	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
2,4-Dichlorophenol	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
2,4-Dimethylphenol	ug/L	19000	-	-	-	ND(2000)	1200
2,4-Dinitrophenol	ug/L	ND(13000)	-	-	-	ND(5000)	ND(1300)
2,4-Dinitrotoluene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
2,6-Dinitrotoluene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
2-Chloronaphthalene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
2-Chlorophenol	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-111300-WP-566*	*GW-111500-WP-593*	*GW-112000-WP-672*	*GW-112700-WP-698*	*GW-121800-WP-703*
Sample Date.		*10/8/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*						
2-Methyl naphthalene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
2-Methylphenol	ug/L	47000	-	-	-	ND(2000)	2400
2-Nitroaniline	ug/L	ND(13000)	-	-	-	ND(5000)	ND(1300)
2-Nitrophenol	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
3,3'-Dichlorobenzidine	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
3-Nitroaniline	ug/L	ND(13000)	-	-	-	ND(5000)	ND(1300)
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	-	-	-	ND(5000)	ND(1300)
4-Bromophenyl phenyl ether	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
4-Chloro-3-methylphenol	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
4-Chloroaniline	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
4-Methylphenol	ug/L	110000	-	-	-	3600	6900
4-Nitroaniline	ug/L	ND(13000)	-	-	-	ND(5000)	ND(1300)
4-Nitrophenol	ug/L	ND(13000)	-	-	-	ND(5000)	ND(1300)
Acenaphthene	ug/L	ND(5000) UJ	-	-	-	ND(2000)	ND(500)
Acenaphthylene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Anthracene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Benzo(a)anthracene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Benzo(a)pyrene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Benzo(b)fluoranthene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Benzo(g,h,i)perylene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Benzo(k)fluoranthene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
bis(2-Chloroethyl)ether	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Butyl benzylphthalate	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Carbazole	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Chrysene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Dibenz(a,h)anthracene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Dibenzofuran	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Diethyl phthalate	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Dimethyl phthalate	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Di-n-butylphthalate	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Di-n-octyl phthalate	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Fluoranthene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Fluorene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Hexachlorobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Hexachlorobutadiene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Hexachlorocyclopentadiene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Hexachloroethane	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Isophorone	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Naphthalene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Nitrobenzene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
N-Nitrosodiphenylamine	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Pentachlorophenol	ug/L	ND(13000)	-	-	-	ND(5000)	ND(1300)
Phenanthrene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)
Phenol	ug/L	160000	-	-	-	4700	9700
Pyrene	ug/L	ND(5000)	-	-	-	ND(2000)	ND(500)

GROUNDWATER ANALYTICAL RESULTS - WN-1E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*	*WN-1E*
Sample ID:		*GW-100800-WP-025*	*GW-111300-WP-566*	*GW-111500-WP-593*	*GW-112000-WP-672*	*GW-112700-WP-698*	*GW-121800-WP-703*
Sample Date:		*10/8/2000*	*11/13/2000*	*11/15/2000*	*11/20/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*						
Metals							
Arsenic	ug/L	18000	870	1000	810	1600	2200
General Chemistry							
Ammonia	mg/L	1700	36	25	20	56	74
Cyanide (total)	mg/L	1.3 J	-	-	-	0.092 J	0.059
Phenolics (Total)	mg/L	1500	7.2	6.3	5 4	20	38
Thiocyanate	mg/L	8400	-	-	-	160	210

GROUNDWATER ANALYTICAL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*
Sample ID:		*GW-100800-WP-026*	*GW-100800-WP-027*	*GW-101100-WP-065*	*GW-101300-WP-093*	*GW-101500-WP-121*	*GW-101800-WP-160*	*GW-102000-WP-185*
Sample Date:		*10/8/2000*	*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*
			Dupl.					
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
2-Butanone	ug/L	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5 0)
2-Hexanone	ug/L	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5 0)
4-Methyl-2-pentanone	ug/L	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Acetone	ug/L	5.1	5.8	5.3	ND(5.0)	ND(5.0)	ND(5.0)	5.1
Benzene	ug/L	15	15	14	13	13	14	14
Bromodichloromethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromoform	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromomethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Carbon disulfide	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
Chlorobromomethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1.0)	ND(1.0)
Chloroform	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloromethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
cis-1,2-Dichloroethene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Methylene chloride	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Styrene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Tetrachloroethene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Toluene	ug/L	4.7	4.7	4.4	4.0	4.4	4.3	4.1
trans-1,2-Dichloroethene	ug/L	ND(1.0)	ND(1 0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
Trichloroethene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Xylene (total)	ug/L	4.1	4.0	3.8	3.5	3.7	4.0	3.8
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
1,2-Dichlorobenzene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
1,3-Dichlorobenzene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
1,4-Dichlorobenzene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
2,4,5-Trichlorophenol	ug/L	ND(250)	ND(380)	ND(500)	ND(380)	ND(25)	ND(250)	ND(250)
2,4,6-Trichlorophenol	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
2,4-Dichlorophenol	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
2,4-Dimethylphenol	ug/L	230	290	ND(200)	210	180	170	160
2,4-Dinitrophenol	ug/L	ND(250)	ND(380)	ND(500)	ND(380)	ND(25)	ND(250)	ND(250)
2,4-Dinitrotoluene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
2,6-Dinitrotoluene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
2-Chloronaphthalene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
2-Chlorophenol	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)

GROUNDWATER ANALYTICAL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*
Sample ID:		GW-100800-WP-026	GW-100800-WP-027	GW-101100-WP-065	GW-101300-WP-093	GW-101500-WP-121	GW-101800-WP-160	GW-102000-WP-185
Sample Date:		10/8/2000	10/8/2000 *Dupl.*	10/11/2000	10/13/2000	10/15/2000	10/18/2000	10/20/2000
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
2-Methylphenol	ug/L	720	980	710	750	630	680	600
2-Nitroaniline	ug/L	ND(250)	ND(380)	ND(500)	ND(380)	ND(25)	ND(250)	ND(250)
2-Nitrophenol	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
3,3'-Dichlorobenzidine	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
3-Nitroaniline	ug/L	ND(250)	ND(380)	ND(500)	ND(380)	ND(25)	ND(250)	ND(250)
4,6-Dinitro-2-methylphenol	ug/L	ND(250)	ND(380)	ND(500)	ND(380)	ND(25)	ND(250)	ND(250)
4-Bromophenyl phenyl ether	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
4-Chloro-3-methylphenol	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
4-Chloroaniline	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
4-Chlorophenyl phenyl ether	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
4-Methylphenol	ug/L	880	1400	840	960	830	780	640
4-Nitroaniline	ug/L	ND(250)	ND(380)	ND(500)	ND(380)	ND(25)	ND(250)	ND(250)
4-Nitrophenol	ug/L	ND(250)	ND(380)	ND(500)	ND(380)	ND(25)	ND(250)	ND(250)
Acenaphthene	ug/L	ND(100) UJ	ND(150) UJ	ND(200) UJ	ND(150)	ND(10)	ND(100)	ND(100)
Acenaphthylene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Anthracene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Benzo(a)anthracene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Benzo(a)pyrene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Benzo(b)fluoranthene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Benzo(g,h,i)perylene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Benzo(k)fluoranthene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
bis(2-Chloroethoxy)methane	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
bis(2-Chloroethyl)ether	ug/L	ND(100)	300	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
bis(2-Chloroisopropyl)ether	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
bis(2-Ethylhexyl)phthalate	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Butyl benzylphthalate	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Carbazole	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Chrysene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Dibenz(a,h)anthracene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Dibenzofuran	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Diethyl phthalate	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Dimethyl phthalate	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Di-n-butylphthalate	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Di-n-octyl phthalate	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Fluoranthene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Fluorene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Hexachlorobenzene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Hexachlorobutadiene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Hexachlorocyclopentadiene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Hexachloroethane	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Indeno(1,2,3-cd)pyrene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Isophorone	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Naphthalene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Nitrobenzene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
N-Nitrosodi-n-propylamine	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
N-Nitrosodiphenylamine	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Pentachlorophenol	ug/L	ND(250)	ND(380)	ND(500)	ND(380)	ND(25)	ND(250)	ND(250)
Phenanthrene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)
Phenol	ug/L	610 J	1400	400	490	270	290	210
Pyrene	ug/L	ND(100)	ND(150)	ND(200)	ND(150)	ND(10)	ND(100)	ND(100)

GROUNDWATER ANALY. _AL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*
Sample ID:		*GW-100800-WP-026*	*GW-100800-WP-027*	*GW-101100-WP-065*	*GW-101300-WP-093*	*GW-101500-WP-121*	*GW-101800-WP-160*	*GW-102000-WP-185*
Sample Date:		*10/8/2000*	*10/8/2000 DupL*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	530	520	500	540	550	550	590
General Chemistry								
Ammonia	mg/L	28	24	26	21	15	14 J	-
Cyanide (total)	mg/L	0.066 J	0 042 J	0.060	0.051	0.031	ND(0.050) UJ	ND(0.010)
Phenolics (Total)	mg/L	3.9	3.7	4.0	2.4	2.6 J	2.4	2.1
Thiocyanate	mg/L	6900	140	190	54	46	29	25

GROUNDWATER ANALYTICAL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*
Sample ID:		*GW-102200-WP-205*	*GW-102600-WP-275*	*GW-102800-WP-313*	*GW-103000-WP-356*	*GW-110100-WP-389*	*GW-110300-WP-422*	*GW-110500-WP-455*
Sample Date:		*10/22/2000*	*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1 0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(1.0)	-	-	ND(1 0)	-	-	ND(1.0)
1,1-Dichloroethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
2-Butanone	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	ND(5.0)
2-Hexanone	ug/L	ND(5 0)	-	-	ND(5.0)	-	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	ND(5.0)
Acetone	ug/L	ND(5.0)	-	-	ND(5.0)	-	-	ND(5.0)
Benzene	ug/L	14	-	-	12	-	-	10
Bromodichloromethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Bromoform	ug/L	ND(1.0)	-	-	ND(1 0)	-	-	ND(1 0)
Bromomethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Carbon disulfide	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Chlorobromomethane	ug/L	ND(1 0)	-	-	ND(1.0)	-	-	ND(1.0)
Chloroethane	ug/L	ND(1.0)	-	-	ND(1 0)	-	-	ND(1.0)
Chloroform	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Chloromethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1 0)
cis-1,2-Dichloroethene	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(1 0)	-	-	ND(1.0)	-	-	ND(1 0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Methylene chloride	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Styrene	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Tetrachloroethene	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Toluene	ug/L	4.1	-	-	3.4	-	-	2.8
trans-1,2-Dichloroethene	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Trichloroethene	ug/L	ND(1 0)	-	-	ND(1.0)	-	-	ND(1 0)
Vinyl chloride	ug/L	ND(1.0)	-	-	ND(1.0)	-	-	ND(1.0)
Xylene (total)	ug/L	3.8	-	-	3.2	-	-	2.8
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
1,2-Dichlorobenzene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
1,3-Dichlorobenzene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
1,4-Dichlorobenzene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
2,4,5-Trichlorophenol	ug/L	ND(250)	-	-	ND(75)	-	-	ND(75)
2,4,6-Trichlorophenol	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
2,4-Dichlorophenol	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
2,4-Dimethylphenol	ug/L	180	-	-	130	-	-	72
2,4-Dinitrophenol	ug/L	ND(250)	-	-	ND(75)	-	-	ND(75)
2,4-Dinitrotoluene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
2,6-Dinitrotoluene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
2-Chloronaphthalene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
2-Chlorophenol	ug/L	ND(100)	-	-	ND(30)	-	-	0)

GROUNDWATER ANALYTICAL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*
Sample ID:		*GW-102200-WP-205*	*GW-102600-WP-275*	*GW-102800-WP-313*	*GW-103000-WP-356*	*GW-110100-WP-389*	*GW-110300-WP-422*	*GW-110500-WP-455*
Sample Date:		*10/22/2000*	*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
2-Methylphenol	ug/L	620	-	-	320	-	-	120
2-Nitroaniline	ug/L	ND(250)	-	-	ND(75)	-	-	ND(75)
2-Nitrophenol	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
3,3'-Dichlorobenzidine	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
3-Nitroaniline	ug/L	ND(250)	-	-	ND(75)	-	-	ND(75)
4,6-Dinitro-2-methylphenol	ug/L	ND(250)	-	-	ND(75)	-	-	ND(75)
4-Bromophenyl phenyl ether	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
4-Chloro-3-methylphenol	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
4-Chloroaniline	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
4-Chlorophenyl phenyl ether	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
4-Methylphenol	ug/L	290	-	-	250	-	-	60
4-Nitroaniline	ug/L	ND(250)	-	-	ND(75)	-	-	ND(75)
4-Nitrophenol	ug/L	ND(250)	-	-	ND(75)	-	-	ND(75)
Acenaphthene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Acenaphthylene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Anthracene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Benzo(a)anthracene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Benzo(a)pyrene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Benzo(b)fluoranthene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Benzo(g,h,i)perylene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Benzo(k)fluoranthene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
bis(2-Chloroethoxy)methane	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
bis(2-Chloroethyl)ether	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
bis(2-Chloroisopropyl)ether	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
bis(2-Ethylhexyl)phthalate	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Butyl benzylphthalate	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Carbazole	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Chrysene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Dibenz(a,h)anthracene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Dibenzofuran	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Diethyl phthalate	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Dimethyl phthalate	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Di-n-butylphthalate	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Di-n-octyl phthalate	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Fluoranthene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Fluorene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Hexachlorobenzene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Hexachlorobutadiene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Hexachlorocyclopentadiene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Hexachloroethane	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Indeno(1,2,3-cd)pyrene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Isophorone	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Naphthalene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Nitrobenzene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
N-Nitrosodi-n-propylamine	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
N-Nitrosodiphenylamine	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Pentachlorophenol	ug/L	ND(250)	-	-	ND(75)	-	-	ND(75)
Phenanthrene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)
Phenol	ug/L	210	-	-	62	-	-	ND(30)
Pyrene	ug/L	ND(100)	-	-	ND(30)	-	-	ND(30)

GROUNDWATER ANALYTICAL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*
Sample ID:		*GW-102200-WP-205*	*GW-102600-WP-275*	*GW-102800-WP-313*	*GW-103000-WP-356*	*GW-110100-WP-389*	*GW-110300-WP-422*	*GW-110500-WP-455*
Sample Date:		*10/22/2000*	*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	-	600	590	690	590	670	720
General Chemistry								
Ammonia	mg/L	17	18	15	15	15	13	16
Cyanide (total)	mg/L	ND(0.010)	-	-	0.041	-	-	ND(0.010)
Phenolics (Total)	mg/L	1.7	2.0	0.78	2.0	0.76	0.59	2.2
Thiocyanate	mg/L	-	-	-	51	-	-	1.6

TABLE F.6

GROUNDWATER ANALYTICAL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*
Sample ID:		*GW-110700-WP-481*	*GW-110900-WP-508*	*GW-111200-WP-548*	*GW-111400-WP-581*	*GW-111600-WP-614*	*GW-111700-WP-627*	*GW-111900-WP-659*
Sample Date:		*11/7/2000*	*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	-	-	-	-
1,1,2-Trichloroethane	ug/L	-	-	-	-	-	-	-
1,1-Dichloroethane	ug/L	-	-	-	-	-	-	-
1,1-Dichloroethene	ug/L	-	-	-	-	-	-	-
1,2-Dichloroethane	ug/L	-	-	-	-	-	-	-
1,2-Dichloropropane	ug/L	-	-	-	-	-	-	-
2-Butanone	ug/L	-	-	-	-	-	-	-
2-Hexanone	ug/L	-	-	-	-	-	-	-
4-Methyl-2-pentanone	ug/L	-	-	-	-	-	-	-
Acetone	ug/L	-	-	-	-	-	-	-
Benzene	ug/L	-	-	-	-	-	-	-
Bromodichloromethane	ug/L	-	-	-	-	-	-	-
Bromoform	ug/L	-	-	-	-	-	-	-
Bromomethane	ug/L	-	-	-	-	-	-	-
Carbon disulfide	ug/L	-	-	-	-	-	-	-
Carbon tetrachloride	ug/L	-	-	-	-	-	-	-
Chlorobenzene	ug/L	-	-	-	-	-	-	-
Chlorobromomethane	ug/L	-	-	-	-	-	-	-
Chloroethane	ug/L	-	-	-	-	-	-	-
Chloroform	ug/L	-	-	-	-	-	-	-
Chloromethane	ug/L	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	-	-	-	-	-
Methylene chloride	ug/L	-	-	-	-	-	-	-
Styrene	ug/L	-	-	-	-	-	-	-
Tetrachloroethene	ug/L	-	-	-	-	-	-	-
Toluene	ug/L	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	-
Trichloroethene	ug/L	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	-
Xylene (total)	ug/L	-	-	-	-	-	-	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	-	-	-	-	-
1,2-Dichlorobenzene	ug/L	-	-	-	-	-	-	-
1,3-Dichlorobenzene	ug/L	-	-	-	-	-	-	-
1,4-Dichlorobenzene	ug/L	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	ug/L	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	ug/L	-	-	-	-	-	-	-
2,4-Dichlorophenol	ug/L	-	-	-	-	-	-	-
2,4-Dimethylphenol	ug/L	-	-	-	-	-	-	-
2,4-Dinitrophenol	ug/L	-	-	-	-	-	-	-
2,4-Dinitrotoluene	ug/L	-	-	-	-	-	-	-
2,6-Dinitrotoluene	ug/L	-	-	-	-	-	-	-
2-Chloronaphthalene	ug/L	-	-	-	-	-	-	-
2-Chlorophenol	ug/L	-	-	-	-	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*
Sample ID:		*GW-110700-WP-481*	*GW-110900-WP-508*	*GW-111200-WP-548*	*GW-111400-WP-581*	*GW-111600-WP-614*	*GW-111700-WP-627*	*GW-111900-WP-659*
Sample Date:		*11/7/2000*	*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	-	-	-	-	-
2-Methylphenol	ug/L	-	-	-	-	-	-	-
2-Nitroaniline	ug/L	-	-	-	-	-	-	-
2-Nitrophenol	ug/L	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	ug/L	-	-	-	-	-	-	-
3-Nitroaniline	ug/L	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	ug/L	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	ug/L	-	-	-	-	-	-	-
4-Chloroaniline	ug/L	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	ug/L	-	-	-	-	-	-	-
4-Methylphenol	ug/L	-	-	-	-	-	-	-
4-Nitroaniline	ug/L	-	-	-	-	-	-	-
4-Nitrophenol	ug/L	-	-	-	-	-	-	-
Acenaphthene	ug/L	-	-	-	-	-	-	-
Acenaphthylene	ug/L	-	-	-	-	-	-	-
Anthracene	ug/L	-	-	-	-	-	-	-
Benzo(a)anthracene	ug/L	-	-	-	-	-	-	-
Benzo(a)pyrene	ug/L	-	-	-	-	-	-	-
Benzo(b)fluoranthene	ug/L	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	ug/L	-	-	-	-	-	-	-
Benzo(k)fluoranthene	ug/L	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	ug/L	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	ug/L	-	-	-	-	-	-	-
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	-	-	-	-
Butyl benzylphthalate	ug/L	-	-	-	-	-	-	-
Carbazole	ug/L	-	-	-	-	-	-	-
Chrysene	ug/L	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	ug/L	-	-	-	-	-	-	-
Dibenzofuran	ug/L	-	-	-	-	-	-	-
Diethyl phthalate	ug/L	-	-	-	-	-	-	-
Dimethyl phthalate	ug/L	-	-	-	-	-	-	-
Di-n-butylphthalate	ug/L	-	-	-	-	-	-	-
Di-n-octyl phthalate	ug/L	-	-	-	-	-	-	-
Fluoranthene	ug/L	-	-	-	-	-	-	-
Fluorene	ug/L	-	-	-	-	-	-	-
Hexachlorobenzene	ug/L	-	-	-	-	-	-	-
Hexachlorobutadiene	ug/L	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	ug/L	-	-	-	-	-	-	-
Hexachloroethane	ug/L	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	-	-	-	-
Isophorone	ug/L	-	-	-	-	-	-	-
Naphthalene	ug/L	-	-	-	-	-	-	-
Nitrobenzene	ug/L	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	ug/L	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	ug/L	-	-	-	-	-	-	-
Pentachlorophenol	ug/L	-	-	-	-	-	-	-
Phenanthrene	ug/L	-	-	-	-	-	-	-
Phenol	ug/L	-	-	-	-	-	-	-
Pyrene	ug/L	-	-	-	-	-	-	-

GROUNDWATER ANAL. .AL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*	*WN-2A*
Sample ID:		*GW-110700-WP-481*	*GW-110900-WP-508*	*GW-111200-WP-548*	*GW-111400-WP-581*	*GW-111600-WP-614*	*GW-111700-WP-627*	*GW-111900-WP-659*
Sample Date:		*11/7/2000*	*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	680	660	640	710	730	720	730
General Chemistry								
Ammonia	mg/L	11	16	52	11	11	11	8.2
Cyanide (total)	mg/L	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	0.38	0 37	0.77	0.21	0.11	0.16	0.13
Thiocyanate	mg/L	-	-	-	-	-	-	-

TABLE F.6

GROUNDWATER ANALYTICAL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		WN-2A
Sample ID:		GW-121800-WP-704
Sample Date:		12/18/2000
Parameter	*Unit*	
Volatiles		
1,1,1-Trichloroethane	ug/L	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(1.0)
1,1-Dichloroethane	ug/L	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)
2-Butanone	ug/L	ND(5.0)
2-Hexanone	ug/L	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(5.0)
Acetone	ug/L	ND(5.0)
Benzene	ug/L	7.6
Bromodichloromethane	ug/L	ND(1.0)
Bromoform	ug/L	ND(1.0)
Bromomethane	ug/L	ND(1.0)
Carbon disulfide	ug/L	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)
Chlorobromomethane	ug/L	-
Chloroethane	ug/L	ND(1.0)
Chloroform	ug/L	ND(1.0)
Chloromethane	ug/L	1.7
cis-1,2-Dichloroethene	ug/L	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(1.0)
Dibromochloromethane	ug/L	ND(1.0)
Ethylbenzene	ug/L	ND(1.0)
Methylene chloride	ug/L	ND(1.0)
Styrene	ug/L	ND(1.0)
Tetrachloroethene	ug/L	ND(1.0)
Toluene	ug/L	1.8
trans-1,2-Dichloroethene	ug/L	ND(1 0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)
Trichloroethene	ug/L	ND(1.0)
Vinyl chloride	ug/L	ND(2.0)
Xylene (total)	ug/L	ND(2.0)
Semi - Volatiles		
1,2,4-Trichlorobenzene	ug/L	ND(10)
1,2-Dichlorobenzene	ug/L	ND(10)
1,3-Dichlorobenzene	ug/L	ND(10)
1,4-Dichlorobenzene	ug/L	ND(10)
2,4,5-Trichlorophenol	ug/L	ND(25)
2,4,6-Trichlorophenol	ug/L	ND(10)
2,4-Dichlorophenol	ug/L	ND(10)
2,4-Dimethylphenol	ug/L	26
2,4-Dinitrophenol	ug/L	ND(25)
2,4-Dinitrotoluene	ug/L	ND(10)
2,6-Dinitrotoluene	ug/L	ND(10)
2-Chloronaphthalene	ug/L	ND(10)
2-Chlorophenol	ug/L	ND(10)

GROUNDWATER ANAL. .AL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*WN-2A*
Sample ID:		*GW-121800-WP-704*
Sample Date:		*12/18/2000*
Parameter	*Unit*	
2-Methyl naphthalene	ug/L	ND(10)
2-Methylphenol	ug/L	ND(10)
2-Nitroaniline	ug/L	ND(25)
2-Nitrophenol	ug/L	ND(10)
3,3'-Dichlorobenzidine	ug/L	ND(10)
3-Nitroaniline	ug/L	ND(25)
4,6-Dinitro-2-methylphenol	ug/L	ND(25)
4-Bromophenyl phenyl ether	ug/L	ND(10)
4-Chloro-3-methylphenol	ug/L	ND(10)
4-Chloroaniline	ug/L	ND(10)
4-Chlorophenyl phenyl ether	ug/L	ND(10)
4-Methylphenol	ug/L	ND(10)
4-Nitroaniline	ug/L	ND(25)
4-Nitrophenol	ug/L	ND(25)
Acenaphthene	ug/L	ND(10)
Acenaphthylene	ug/L	ND(10)
Anthracene	ug/L	ND(10)
Benzo(a)anthracene	ug/L	ND(10)
Benzo(a)pyrene	ug/L	ND(10)
Benzo(b)fluoranthene	ug/L	ND(10)
Benzo(g,h,i)perylene	ug/L	ND(10)
Benzo(k)fluoranthene	ug/L	ND(10)
bis(2-Chloroethoxy)methane	ug/L	ND(10)
bis(2-Chloroethyl)ether	ug/L	ND(10)
bis(2-Chloroisopropyl)ether	ug/L	ND(10)
bis(2-Ethylhexyl)phthalate	ug/L	ND(10)
Butyl benzylphthalate	ug/L	ND(10)
Carbazole	ug/L	ND(10)
Chrysene	ug/L	ND(10)
Dibenz(a,h)anthracene	ug/L	ND(10)
Dibenzofuran	ug/L	ND(10)
Diethyl phthalate	ug/L	ND(10)
Dimethyl phthalate	ug/L	ND(10)
Di-n-butylphthalate	ug/L	ND(10)
Di-n-octyl phthalate	ug/L	ND(10)
Fluoranthene	ug/L	ND(10)
Fluorene	ug/L	ND(10)
Hexachlorobenzene	ug/L	ND(10)
Hexachlorobutadiene	ug/L	ND(10)
Hexachlorocyclopentadiene	ug/L	ND(10)
Hexachloroethane	ug/L	ND(10)
Indeno(1,2,3-cd)pyrene	ug/L	ND(10)
Isophorone	ug/L	ND(10)
Naphthalene	ug/L	ND(10)
Nitrobenzene	ug/L	ND(10)
N-Nitrosodi-n-propylamine	ug/L	ND(10)
N-Nitrosodiphenylamine	ug/L	ND(10)
Pentachlorophenol	ug/L	ND(25)
Phenanthrene	ug/L	ND(10)
Phenol	ug/L	ND(10)
Pyrene	ug/L	ND(10)

TABLE F.6

GROUNDWATER ANALYTICAL RESULTS - WN-2A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2A*
Sample ID:		*GW-121800-WP-704*
Sample Date:		*12/18/2000*
Parameter	*Unit*	
Metals		
Arsenic	ug/L	730
General Chemistry		
Ammonia	mg/L	8.2
Cyanide (total)	mg/L	0.062
Phenolics (Total)	mg/L	0.074
Thiocyanate	mg/L	1.7

GROUNDWATER ANAL AL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*
Sample ID		*GW-100800-WP-028*	*GW-101100-WP-066*	*GW-101300-WP-094*	*GW-101500-WP-122*	*GW-101800-WP-161*	*GW-102000-WP-186*	*GW-102200-WP-206*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2-Butanone	ug/L	ND(5.0)	ND(5 0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
2-Hexanone	ug/L	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Acetone	ug/L	24	15	9.6	10	7.1	6.5	6.6
Benzene	ug/L	97	75	57	52	41	38	35
Bromodichloromethane	ug/L	ND(1.0)	ND(1 0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromoform	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
Bromomethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Carbon disulfide	ug/L	4.9	1.4	1.4	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chlorobromomethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloroethane	ug/L	ND(1.0)	ND(1 0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloroform	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloromethane	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,2-Dichloroethene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	1.7	1.6	1.2	1.1	ND(1.0)	ND(1.0)	ND(1 0)
Methylene chloride	ug/L	ND(1 0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Styrene	ug/L	3.0	2.5	1.8	1.7	1.3	1.2	1.2
Tetrachloroethene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Toluene	ug/L	26	19	15	14	11	10	9.1
trans-1,2-Dichloroethene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichloroethene	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Xylene (total)	ug/L	19	15	12	11	8.9	8.8	8.2
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
1,2-Dichlorobenzene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
1,3-Dichlorobenzene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
1,4-Dichlorobenzene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
2,4,5-Trichlorophenol	ug/L	ND(2500)	ND(2500)	ND(1300)	ND(1300)	ND(1300)	ND(1300)	ND(380)
2,4,6-Trichlorophenol	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
2,4-Dichlorophenol	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
2,4-Dimethylphenol	ug/L	1600	ND(1000)	710	ND(500)	ND(500)	ND(500)	160
2,4-Dinitrophenol	ug/L	ND(2500)	ND(2500)	ND(1300)	ND(1300)	ND(1300)	ND(1300)	ND(380)
2,4-Dinitrotoluene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
2,6-Dinitrotoluene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
2-Chloronaphthalene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
2-Chlorophenol	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)

TABLE F.7

GROUNDWATER ANALYTICAL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		*GW-100800-WP-028*	*GW-101100-WP-066*	*GW-101300-WP-094*	*GW-101500-WP-122*	*GW-101800-WP-161*	*GW-102000-WP-186*	*GW-102200-WP-206*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
2-Methylphenol	ug/L	4700	3400	2300	1500	930	830	440
2-Nitroaniline	ug/L	ND(2500)	ND(2500)	ND(1300)	ND(1300)	ND(1300)	ND(1300)	ND(380)
2-Nitrophenol	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
3,3'-Dichlorobenzidine	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
3-Nitroaniline	ug/L	ND(2500)	ND(2500)	ND(1300)	ND(1300)	ND(1300)	ND(1300)	ND(380)
4,6-Dinitro-2-methylphenol	ug/L	ND(2500)	ND(2500)	ND(1300)	ND(1300)	ND(1300)	ND(1300)	ND(380)
4-Bromophenyl phenyl ether	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
4-Chloro-3-methylphenol	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
4-Chloroaniline	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
4-Chlorophenyl phenyl ether	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
4-Methylphenol	ug/L	12000	9300	6900	4800	2900	2300	1200
4-Nitroaniline	ug/L	ND(2500)	ND(2500)	ND(1300)	ND(1300)	ND(1300)	ND(1300)	ND(380)
4-Nitrophenol	ug/L	ND(2500)	ND(2500)	ND(1300)	ND(1300)	ND(1300)	ND(1300)	ND(380)
Acenaphthene	ug/L	ND(1000) UJ	ND(1000) UJ	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Acenaphthylene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Anthracene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Benzo(a)anthracene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Benzo(a)pyrene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Benzo(b)fluoranthene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Benzo(g,h,i)perylene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Benzo(k)fluoranthene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
bis(2-Chloroethoxy)methane	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
bis(2-Chloroethyl)ether	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
bis(2-Chloroisopropyl)ether	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
bis(2-Ethylhexyl)phthalate	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Butyl benzylphthalate	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Carbazole	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Chrysene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Dibenz(a,h)anthracene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Dibenzofuran	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Diethyl phthalate	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Dimethyl phthalate	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Di-n-butylphthalate	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Di-n-octyl phthalate	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Fluoranthene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Fluorene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Hexachlorobenzene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Hexachlorobutadiene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Hexachlorocyclopentadiene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Hexachloroethane	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Indeno(1,2,3-cd)pyrene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Isophorone	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Naphthalene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Nitrobenzene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
N-Nitrosodi-n-propylamine	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
N-Nitrosodiphenylamine	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Pentachlorophenol	ug/L	ND(2500)	ND(2500)	ND(1300)	ND(1300)	ND(1300)	ND(1300)	ND(380)
Phenanthrene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)
Phenol	ug/L	16000	12000	8000	5200	2500	1800	980
Pyrene	ug/L	ND(1000)	ND(1000)	ND(500)	ND(500)	ND(500)	ND(500)	ND(150)

GROUNDWATER ANALYTICAL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		*GW-100800-WP-028*	*GW-101100-WP-066*	*GW-101300-WP-094*	*GW-101500-WP-122*	*GW-101800-WP-161*	*GW-102000-WP-186*	*GW-102200-WP-206*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	670	760	800	790	720	700	-
General Chemistry								
Ammonia	mg/L	150	110	78	72	48 J	-	33
Cyanide (total)	mg/L	0.080 J	0.10	ND(0.010)	0.050	0.054 J	ND(0.010)	ND(0.010)
Phenolics (Total)	mg/L	85	140	39	26 J	13	9.8	4.9
Thiocyanate	mg/L	340	350	90	63	43	34	-

GROUNDWATER ANALYTICAL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location		*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		*GW-102600-WP-276*	*GW-102800-WP-314*	*GW-103000-WP-357*	*GW-103000-WP-362*	*GW-110100-WP-390*	*GW-110300-WP-423*	*GW-110500-WP-456*
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	ND(1.0)	-	-	-	ND(1 0)
1,1,2-Trichloroethane	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
1,1-Dichloroethane	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
1,1-Dichloroethene	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
1,2-Dichloroethane	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
1,2-Dichloropropane	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
2-Butanone	ug/L	-	-	ND(5.0)	-	-	-	ND(5.0)
2-Hexanone	ug/L	-	-	ND(5.0)	-	-	-	ND(5 0)
4-Methyl-2-pentanone	ug/L	-	-	ND(5.0)	-	-	-	ND(5.0)
Acetone	ug/L	-	-	ND(5.0)	-	-	-	ND(5.0)
Benzene	ug/L	-	-	23	-	-	-	21
Bromodichloromethane	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Bromoform	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Bromomethane	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Carbon disulfide	ug/L	-	-	ND(1.0)	-	-	-	ND(1 0)
Carbon tetrachloride	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Chlorobenzene	ug/L	-	-	ND(1.0)	-	-	-	ND(1 0)
Chlorobromomethane	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Chloroethane	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Chloroform	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Chloromethane	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	-	ND(1.0)	-	-	-	ND(1 0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	ND(1.0)	-	-	-	ND(1 0)
Methylene chloride	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Styrene	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Tetrachloroethene	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Toluene	ug/L	-	-	5.3	-	-	-	4.1
trans-1,2-Dichloroethene	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Trichloroethene	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Vinyl chloride	ug/L	-	-	ND(1.0)	-	-	-	ND(1.0)
Xylene (total)	ug/L	-	-	5.7	-	-	-	5.1
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	ND(100)	-	-	-	ND(200)
1,2-Dichlorobenzene	ug/L	-	-	ND(100)	-	-	-	ND(200)
1,3-Dichlorobenzene	ug/L	-	-	ND(100)	-	-	-	ND(200)
1,4-Dichlorobenzene	ug/L	-	-	ND(100)	-	-	-	ND(200)
2,4,5-Trichlorophenol	ug/L	-	-	ND(250)	-	-	-	ND(500)
2,4,6-Trichlorophenol	ug/L	-	-	ND(100)	-	-	-	ND(200)
2,4-Dichlorophenol	ug/L	-	-	ND(100)	-	-	-	ND(200)
2,4-Dimethylphenol	ug/L	-	-	140	-	-	-	ND(200)
2,4-Dinitrophenol	ug/L	-	-	ND(250)	-	-	-	ND(500)
2,4-Dinitrotoluene	ug/L	-	-	ND(100)	-	-	-	ND(200)
2,6-Dinitrotoluene	ug/L	-	-	ND(100)	-	-	-	ND(200)
2-Chloronaphthalene	ug/L	-	-	ND(100)	-	-	-	ND(200)
2-Chlorophenol	ug/L	-	-	ND(100)	-	-	-	'00)

GROUNDWATER ANALYTICAL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		GW-102600-WP-276	GW-102800-WP-314	GW-103000-WP-357	GW-103000-WP-362	GW-110100-WP-390	GW-110300-WP-423	GW-110500-WP-456
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	ND(100)	-	-	-	ND(200)
2-Methylphenol	ug/L	-	-	350	-	-	-	300
2-Nitroaniline	ug/L	-	-	ND(250)	-	-	-	ND(500)
2-Nitrophenol	ug/L	-	-	ND(100)	-	-	-	ND(200)
3,3'-Dichlorobenzidine	ug/L	-	-	ND(100)	-	-	-	ND(200)
3-Nitroaniline	ug/L	-	-	ND(250)	-	-	-	ND(500)
4,6-Dinitro-2-methylphenol	ug/L	-	-	ND(250)	-	-	-	ND(500)
4-Bromophenyl phenyl ether	ug/L	-	-	ND(100)	-	-	-	ND(200)
4-Chloro-3-methylphenol	ug/L	-	-	ND(100)	-	-	-	ND(200)
4-Chloroaniline	ug/L	-	-	ND(100)	-	-	-	ND(200)
4-Chlorophenyl phenyl ether	ug/L	-	-	ND(100)	-	-	-	ND(200)
4-Methylphenol	ug/L	-	-	830	-	-	-	670
4-Nitroaniline	ug/L	-	-	ND(250)	-	-	-	ND(500)
4-Nitrophenol	ug/L	-	-	ND(250)	-	-	-	ND(500)
Acenaphthene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Acenaphthylene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Anthracene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Benzo(a)anthracene	ug/L	-	-	*ND(100)*	-	-	-	*ND(200)*
Benzo(a)pyrene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Benzo(b)fluoranthene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Benzo(g,h,i)perylene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Benzo(k)fluoranthene	ug/L	-	-	ND(100)	-	-	-	ND(200)
bis(2-Chloroethoxy)methane	ug/L	-	-	ND(100)	-	-	-	ND(200)
bis(2-Chloroethyl)ether	ug/L	-	-	ND(100)	-	-	-	ND(200)
bis(2-Chloroisopropyl)ether	ug/L	-	-	ND(100)	-	-	-	ND(200)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	ND(100)	-	-	-	ND(200)
Butyl benzylphthalate	ug/L	-	-	ND(100)	-	-	-	ND(200)
Carbazole	ug/L	-	-	ND(100)	-	-	-	ND(200)
Chrysene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Dibenz(a,h)anthracene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Dibenzofuran	ug/L	-	-	ND(100)	-	-	-	ND(200)
Diethyl phthalate	ug/L	-	-	ND(100)	-	-	-	ND(200)
Dimethyl phthalate	ug/L	-	-	ND(100)	-	-	-	ND(200)
Di-n-butylphthalate	ug/L	-	-	ND(100)	-	-	-	ND(200)
Di-n-octyl phthalate	ug/L	-	-	ND(100)	-	-	-	ND(200)
Fluoranthene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Fluorene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Hexachlorobenzene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Hexachlorobutadiene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Hexachlorocyclopentadiene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Hexachloroethane	ug/L	-	-	ND(100)	-	-	-	ND(200)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Isophorone	ug/L	-	-	ND(100)	-	-	-	ND(200)
Naphthalene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Nitrobenzene	ug/L	-	-	ND(100)	-	-	-	ND(200)
N-Nitrosodi-n-propylamine	ug/L	-	-	ND(100)	-	-	-	ND(200)
N-Nitrosodiphenylamine	ug/L	-	-	ND(100)	-	-	-	ND(200)
Pentachlorophenol	ug/L	-	-	ND(250)	-	-	-	ND(500)
Phenanthrene	ug/L	-	-	ND(100)	-	-	-	ND(200)
Phenol	ug/L	-	-	430	-	-	-	200
Pyrene	ug/L	-	-	ND(100)	-	-	-	ND(200)

TABLE F.7

GROUNDWATER ANALYTICAL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		*GW-102600-WP-276*	*GW-102800-WP-314*	*GW-103000-WP-357*	*GW-103000-WP-362*	*GW-110100-WP-390*	*GW-110300-WP-423*	*GW-110500-WP-456*
Sample Date.		*10/26/2000*	*10/28/2000*	*10/30/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	580	600	600	360	600	620	640
General Chemistry								
Ammonia	mg/L	21	17	17	86	12	12	12
Cyanide (total)	mg/L	-	-	0.050	-	-	-	0.050
Phenolics (Total)	mg/L	5.4	3.5	2.9	2.5	2.3	1.6	0.50
Thiocyanate	mg/L	-	-	66	-	-	-	1.6

GROUNDWATER ANALYTICAL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		*GW-110700-WP-482*	*GW-110900-WP-509*	*GW-111200-WP-549*	*GW-111400-WP-582*	*GW-111600-WP-615*	*GW-111700-WP-628*	*GW-111900-WP-660*
Sample Date:		*11/7/2000*	*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	-	-	-	-
1,1,2-Trichloroethane	ug/L	-	-	-	-	-	-	-
1,1-Dichloroethane	ug/L	-	-	-	-	-	-	-
1,1-Dichloroethene	ug/L	-	-	-	-	-	-	-
1,2-Dichloroethane	ug/L	-	-	-	-	-	-	-
1,2-Dichloropropane	ug/L	-	-	-	-	-	-	-
2-Butanone	ug/L	-	-	-	-	-	-	-
2-Hexanone	ug/L	-	-	-	-	-	-	-
4-Methyl-2-pentanone	ug/L	-	-	-	-	-	-	-
Acetone	ug/L	-	-	-	-	-	-	-
Benzene	ug/L	-	-	-	-	-	-	-
Bromodichloromethane	ug/L	-	-	-	-	-	-	-
Bromoform	ug/L	-	-	-	-	-	-	-
Bromomethane	ug/L	-	-	-	-	-	-	-
Carbon disulfide	ug/L	-	-	-	-	-	-	-
Carbon tetrachloride	ug/L	-	-	-	-	-	-	-
Chlorobenzene	ug/L	-	-	-	-	-	-	-
Chlorobromomethane	ug/L	-	-	-	-	-	-	-
Chloroethane	ug/L	-	-	-	-	-	-	-
Chloroform	ug/L	-	-	-	-	-	-	-
Chloromethane	ug/L	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	-	-	-	-	-
Methylene chloride	ug/L	-	-	-	-	-	-	-
Styrene	ug/L	-	-	-	-	-	-	-
Tetrachloroethene	ug/L	-	-	-	-	-	-	-
Toluene	ug/L	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	-
Trichloroethene	ug/L	-	-	-	-	-	-	-
Vinyl chloride	ug/L	-	-	-	-	-	-	-
Xylene (total)	ug/L	-	-	-	-	-	-	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	-	-	-	-	-
1,2-Dichlorobenzene	ug/L	-	-	-	-	-	-	-
1,3-Dichlorobenzene	ug/L	-	-	-	-	-	-	-
1,4-Dichlorobenzene	ug/L	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	ug/L	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	ug/L	-	-	-	-	-	-	-
2,4-Dichlorophenol	ug/L	-	-	-	-	-	-	-
2,4-Dimethylphenol	ug/L	-	-	-	-	-	-	-
2,4-Dinitrophenol	ug/L	-	-	-	-	-	-	-
2,4-Dinitrotoluene	ug/L	-	-	-	-	-	-	-
2,6-Dinitrotoluene	ug/L	-	-	-	-	-	-	-
2-Chloronaphthalene	ug/L	-	-	-	-	-	-	-
2-Chlorophenol	ug/L	-	-	-	-	-	-	-

TABLE F.7

GROUNDWATER ANALYTICAL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		*GW-110700-WP-482*	*GW-110900-WP-509*	*GW-111200-WP-549*	*GW-111400-WP-582*	*GW-111600-WP-615*	*GW-111700-WP-628*	*GW-111900-WP-660*
Sample Date:		*11/7/2000*	*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	-	-	-	-	-
2-Methylphenol	ug/L	-	-	-	-	-	-	-
2-Nitroaniline	ug/L	-	-	-	-	-	-	-
2-Nitrophenol	ug/L	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	ug/L	-	-	-	-	-	-	-
3-Nitroaniline	ug/L	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	ug/L	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	ug/L	-	-	-	-	-	-	-
4-Chloroaniline	ug/L	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	ug/L	-	-	-	-	-	-	-
4-Methylphenol	ug/L	-	-	-	-	-	-	-
4-Nitroaniline	ug/L	-	-	-	-	-	-	-
4-Nitrophenol	ug/L	-	-	-	-	-	-	-
Acenaphthene	ug/L	-	-	-	-	-	-	-
Acenaphthylene	ug/L	-	-	-	-	-	-	-
Anthracene	ug/L	-	-	-	-	-	-	-
Benzo(a)anthracene	ug/L	-	-	-	-	-	-	-
Benzo(a)pyrene	ug/L	-	-	-	-	-	-	-
Benzo(b)fluoranthene	ug/L	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	ug/L	-	-	-	-	-	-	-
Benzo(k)fluoranthene	ug/L	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	ug/L	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	ug/L	-	-	-	-	-	-	-
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	-	-	-	-
Butyl benzylphthalate	ug/L	-	-	-	-	-	-	-
Carbazole	ug/L	-	-	-	-	-	-	-
Chrysene	ug/L	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	ug/L	-	-	-	-	-	-	-
Dibenzofuran	ug/L	-	-	-	-	-	-	-
Diethyl phthalate	ug/L	-	-	-	-	-	-	-
Dimethyl phthalate	ug/L	-	-	-	-	-	-	-
Di-n-butylphthalate	ug/L	-	-	-	-	-	-	-
Di-n-octyl phthalate	ug/L	-	-	-	-	-	-	-
Fluoranthene	ug/L	-	-	-	-	-	-	-
Fluorene	ug/L	-	-	-	-	-	-	-
Hexachlorobenzene	ug/L	-	-	-	-	-	-	-
Hexachlorobutadiene	ug/L	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	ug/L	-	-	-	-	-	-	-
Hexachloroethane	ug/L	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	-	-	-	-
Isophorone	ug/L	-	-	-	-	-	-	-
Naphthalene	ug/L	-	-	-	-	-	-	-
Nitrobenzene	ug/L	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	ug/L	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	ug/L	-	-	-	-	-	-	-
Pentachlorophenol	ug/L	-	-	-	-	-	-	-
Phenanthrene	ug/L	-	-	-	-	-	-	-
Phenol	ug/L	-	-	-	-	-	-	-
Pyrene	ug/L	-	-	-	-	-	-	-

TABLE F.7

GROUNDWATER ANALYTICAL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		*GW-110700-WP-482*	*GW-110900-WP-509*	*GW-111200-WP-549*	*GW-111400-WP-582*	*GW-111600-WP-615*	*GW-111700-WP-628*	*GW-111900-WP-660*
Sample Date:		*11/7/2000*	*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	700	710	610	700	790	1100	770
General Chemistry								
Ammonia	mg/L	10	11	15	11	9.4	58	17
Cyanide (total)	mg/L	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	1.3	1.2	1.1	0.89	0.98	21	2.5
Thiocyanate	mg/L	-	-	-	-	-	-	-

TABLE F.7

GROUNDWATER ANALYTICAL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		*GW-112000-WP-669*	*GW-112700-WP-689*	*GW-121800-WP-705*
Sample Date:		*11/20/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*			
Volatiles				
1,1,1-Trichloroethane	ug/L	-	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	ug/L	-	ND(1 0)	ND(1.0)
1,1-Dichloroethane	ug/L	-	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	-	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	-	ND(1.0)	ND(1.0)
1,2-Dichloropropane	ug/L	-	ND(1 0)	ND(1.0)
2-Butanone	ug/L	-	ND(5.0)	ND(5.0)
2-Hexanone	ug/L	-	ND(5.0)	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	ND(5.0)	ND(5.0)
Acetone	ug/L	-	ND(5.0)	ND(5.0)
Benzene	ug/L	-	25	22
Bromodichloromethane	ug/L	-	ND(1.0)	ND(1.0)
Bromoform	ug/L	-	ND(1.0)	ND(1.0)
Bromomethane	ug/L	-	ND(1.0)	ND(1.0)
Carbon disulfide	ug/L	-	ND(1.0)	ND(1.0)
Carbon tetrachloride	ug/L	-	ND(1 0)	ND(1.0)
Chlorobenzene	ug/L	-	ND(1.0)	ND(1.0)
Chlorobromomethane	ug/L	-	ND(1.0)	-
Chloroethane	ug/L	-	ND(1.0)	ND(1.0)
Chloroform	ug/L	-	ND(1.0)	ND(1.0)
Chloromethane	ug/L	-	ND(1.0)	ND(1.0)
cis-1,2-Dichloroethene	ug/L	-	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	ND(1.0)	ND(1.0)
Dibromochloromethane	ug/L	-	-	ND(1.0)
Ethylbenzene	ug/L	-	ND(1.0)	ND(1.0)
Methylene chloride	ug/L	-	ND(1.0)	ND(1.0)
Styrene	ug/L	-	ND(1.0)	ND(1.0)
Tetrachloroethene	ug/L	-	ND(1.0)	ND(1.0)
Toluene	ug/L	-	5.5	5.0
trans-1,2-Dichloroethene	ug/L	-	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	ND(1.0)	ND(1.0)
Trichloroethene	ug/L	-	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	-	ND(1.0)	ND(2.0)
Xylene (total)	ug/L	-	6.0	4.2
Semi - Volatiles				
1,2,4-Trichlorobenzene	ug/L	-	ND(200)	ND(20)
1,2-Dichlorobenzene	ug/L	-	ND(200)	ND(20)
1,3-Dichlorobenzene	ug/L	-	ND(200)	ND(20)
1,4-Dichlorobenzene	ug/L	-	ND(200)	ND(20)
2,4,5-Trichlorophenol	ug/L	-	ND(500)	ND(50)
2,4,6-Trichlorophenol	ug/L	-	ND(200)	ND(20)
2,4-Dichlorophenol	ug/L	-	ND(200)	ND(20)
2,4-Dimethylphenol	ug/L	-	250	120
2,4-Dinitrophenol	ug/L	-	ND(500)	ND(50)
2,4-Dinitrotoluene	ug/L	-	ND(200)	ND(20)
2,6-Dinitrotoluene	ug/L	-	ND(200)	ND(20)
2-Chloronaphthalene	ug/L	-	ND(200)	ND(20)
2-Chlorophenol	ug/L	-	ND(200)	ND(20)

GROUNDWATER ANAL. .AL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		*GW-112000-WP-669*	*GW-112700-WP-689*	*GW-121800-WP-705*
Sample Date:		*11/20/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*			
2-Methyl naphthalene	ug/L	-	ND(200)	ND(20)
2-Methylphenol	ug/L	-	530	290
2-Nitroaniline	ug/L	-	ND(500)	ND(50)
2-Nitrophenol	ug/L	-	ND(200)	ND(20)
3,3'-Dichlorobenzidine	ug/L	-	ND(200)	ND(20)
3-Nitroaniline	ug/L	-	ND(500)	ND(50)
4,6-Dinitro-2-methylphenol	ug/L	-	ND(500)	ND(50)
4-Bromophenyl phenyl ether	ug/L	-	ND(200)	ND(20)
4-Chloro-3-methylphenol	ug/L	-	ND(200)	ND(20)
4-Chloroaniline	ug/L	-	ND(200)	ND(20)
4-Chlorophenyl phenyl ether	ug/L	-	ND(200)	ND(20)
4-Methylphenol	ug/L	-	880	260
4-Nitroaniline	ug/L	-	ND(500)	ND(50)
4-Nitrophenol	ug/L	-	ND(500)	ND(50)
Acenaphthene	ug/L	-	ND(200)	ND(20)
Acenaphthylene	ug/L	-	ND(200)	ND(20)
Anthracene	ug/L	-	ND(200)	ND(20)
Benzo(a)anthracene	ug/L	-	ND(200)	ND(20)
Benzo(a)pyrene	ug/L	-	ND(200)	ND(20)
Benzo(b)fluoranthene	ug/L	-	ND(200)	ND(20)
Benzo(g,h,i)perylene	ug/L	-	ND(200)	ND(20)
Benzo(k)fluoranthene	ug/L	-	ND(200)	ND(20)
bis(2-Chloroethoxy)methane	ug/L	-	ND(200)	ND(20)
bis(2-Chloroethyl)ether	ug/L	-	ND(200)	ND(20)
bis(2-Chloroisopropyl)ether	ug/L	-	ND(200)	ND(20)
bis(2-Ethylhexyl)phthalate	ug/L	-	ND(200)	ND(20)
Butyl benzylphthalate	ug/L	-	ND(200)	ND(20)
Carbazole	ug/L	-	ND(200)	ND(20)
Chrysene	ug/L	-	ND(200)	ND(20)
Dibenz(a,h)anthracene	ug/L	-	ND(200)	ND(20)
Dibenzofuran	ug/L	-	ND(200)	ND(20)
Diethyl phthalate	ug/L	-	ND(200)	ND(20)
Dimethyl phthalate	ug/L	-	ND(200)	ND(20)
Di-n-butylphthalate	ug/L	-	ND(200)	ND(20)
Di-n-octyl phthalate	ug/L	-	ND(200)	ND(20)
Fluoranthene	ug/L	-	ND(200)	ND(20)
Fluorene	ug/L	-	ND(200)	ND(20)
Hexachlorobenzene	ug/L	-	ND(200)	ND(20)
Hexachlorobutadiene	ug/L	-	ND(200)	ND(20)
Hexachlorocyclopentadiene	ug/L	-	ND(200)	ND(20)
Hexachloroethane	ug/L	-	ND(200)	ND(20)
Indeno(1,2,3-cd)pyrene	ug/L	-	ND(200)	ND(20)
Isophorone	ug/L	-	ND(200)	ND(20)
Naphthalene	ug/L	-	ND(200)	23
Nitrobenzene	ug/L	-	ND(200)	ND(20)
N-Nitrosodi-n-propylamine	ug/L	-	ND(200)	ND(20)
N-Nitrosodiphenylamine	ug/L	-	ND(200)	ND(20)
Pentachlorophenol	ug/L	-	ND(500)	ND(50)
Phenanthrene	ug/L	-	ND(200)	ND(20)
Phenol	ug/L	-	470	ND(20)
Pyrene	ug/L	-	ND(200)	ND(20)

GROUNDWATER ANALYTICAL RESULTS - WN-2B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2B*	*WN-2B*	*WN-2B*
Sample ID:		*GW-112000-WP-669*	*GW-112700-WP-689*	*GW-121800-WP-705*
Sample Date:		*11/20/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*			
Metals				
Arsenic	ug/L	250	470	400
General Chemistry				
Ammonia	mg/L	26	21	21
Cyanide (total)	mg/L	-	0.058	0.056
Phenolics (Total)	mg/L	1.7	2.3	0.85
Thiocyanate	mg/L	-	24	6.7

GROUNDWATER ANALYTICAL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*
Sample ID:		*GW-100800-WP-029*	*GW-101100-WP-067*	*GW-101300-WP-095*	*GW-101500-WP-123*	*GW-101800-WP-162*	*GW-102000-WP-187*	*GW-102200-WP-207*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethane	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloropropane	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
2-Butanone	ug/L	ND(10)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5 0)
2-Hexanone	ug/L	ND(10)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5 0)
4-Methyl-2-pentanone	ug/L	ND(10)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5 0)
Acetone	ug/L	57	16	7.6	7.5	ND(5.0)	ND(5.0)	ND(5.0)
Benzene	ug/L	210	88	66	54	41	37	33
Bromodichloromethane	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
Bromoform	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromomethane	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Carbon disulfide	ug/L	68	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
Carbon tetrachloride	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
Chlorobenzene	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chlorobromomethane	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloroethane	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloroform	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
Chloromethane	ug/L	ND(2.0)	ND(1 0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,2-Dichloroethene	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
cis-1,3-Dichloropropene	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(2.0)	1.2	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Methylene chloride	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Styrene	ug/L	6.6	3.2	2.3	2.0	1.5	1.4	1.2
Tetrachloroethene	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1 0)
Toluene	ug/L	82	25	14	11	7.3	6.6	6.3
trans-1,2-Dichloroethene	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichloroethene	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Xylene (total)	ug/L	40	21	16	15	12	11	9.9
Semi -Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
1,2-Dichlorobenzene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
1,3-Dichlorobenzene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
1,4-Dichlorobenzene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
2,4,5-Trichlorophenol	ug/L	ND(13000)	ND(5000)	ND(1300)	ND(1300)	ND(1300)	ND(500)	ND(380)
2,4,6-Trichlorophenol	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
2,4-Dichlorophenol	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
2,4-Dimethylphenol	ug/L	ND(5000)	ND(2000)	690	ND(500)	ND(500)	ND(200)	180
2,4-Dinitrophenol	ug/L	ND(13000)	ND(5000)	ND(1300)	ND(1300)	ND(1300)	ND(500)	ND(380)
2,4-Dinitrotoluene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
2,6-Dinitrotoluene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
2-Chloronaphthalene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
2-Chlorophenol	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)

TABLE F.8

GROUNDWATER ANALYTICAL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*
Sample ID:		*GW-100800-WP-029*	*GW-101100-WP-067*	*GW-101300-WP-095*	*GW-101500-WP-123*	*GW-101800-WP-162*	*GW-102000-WP-187*	*GW-102200-WP-207*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
2-Methylphenol	ug/L	10000	3000	1800	1000	ND(500)	420	380
2-Nitroaniline	ug/L	ND(13000)	ND(5000)	ND(1300)	ND(1300)	ND(1300)	ND(500)	ND(380)
2-Nitrophenol	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
3,3'-Dichlorobenzidine	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
3-Nitroaniline	ug/L	ND(13000)	ND(5000)	ND(1300)	ND(1300)	ND(1300)	ND(500)	ND(380)
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	ND(5000)	ND(1300)	ND(1300)	ND(1300)	ND(500)	ND(380)
4-Bromophenyl phenyl ether	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
4-Chloro-3-methylphenol	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
4-Chloroaniline	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
4-Methylphenol	ug/L	29000	8700	5300	3100	1400	1200	1100
4-Nitroaniline	ug/L	ND(13000)	ND(5000)	ND(1300)	ND(1300)	ND(1300)	ND(500)	ND(380)
4-Nitrophenol	ug/L	ND(13000)	ND(5000)	ND(1300)	ND(1300)	ND(1300)	ND(500)	ND(380)
Acenaphthene	ug/L	ND(5000) UJ	ND(2000) UJ	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Acenaphthylene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Anthracene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Benzo(a)anthracene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Benzo(a)pyrene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Benzo(b)fluoranthene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Benzo(g,h,i)perylene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Benzo(k)fluoranthene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
bis(2-Chloroethyl)ether	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Butyl benzylphthalate	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Carbazole	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Chrysene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Dibenz(a,h)anthracene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Dibenzofuran	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Diethyl phthalate	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Dimethyl phthalate	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Di-n-butylphthalate	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Di-n-octyl phthalate	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Fluoranthene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Fluorene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Hexachlorobenzene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Hexachlorobutadiene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Hexachlorocyclopentadiene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Hexachloroethane	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Isophorone	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Naphthalene	ug/L	ND(5000)	ND(2000)	880	690	580	580	610
Nitrobenzene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
N-Nitrosodiphenylamine	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Pentachlorophenol	ug/L	ND(13000)	ND(5000)	ND(1300)	ND(1300)	ND(1300)	ND(500)	ND(380)
Phenanthrene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)
Phenol	ug/L	43000	11000	6100	3600	1300	1100	1000
Pyrene	ug/L	ND(5000)	ND(2000)	ND(500)	ND(500)	ND(500)	ND(200)	ND(150)

GROUNDWATER ANALY. .AL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*
Sample ID:		*GW-100800-WP-029*	*GW-101100-WP-067*	*GW-101300-WP-095*	*GW-101500-WP-123*	*GW-101800-WP-162*	*GW-102000-WP-187*	*GW-102200-WP-207*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	670	570	460	350	160	150	-
General Chemistry								
Ammonia	mg/L	300	180	110	95	80 J	-	49
Cyanide (total)	mg/L	0.011 J	0.096	0.059	0.052	0.056 J	0.053	ND(0.010)
Phenolics (Total)	mg/L	170	570	27	13 J	7.1	6.1	3.9
Thiocyanate	mg/L	710	210	81	68	20	26	-

TABLE F.8

GROUNDWATER ANALYTICAL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*
Sample ID:		*GW-102600-WP-277*	*GW-102800-WP-315*	*GW-103000-WP-358*	*GW-110100-WP-391*	*GW-110300-WP-424*	*GW-110500-WP-457*	*GW-110700-WP-483*
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*	*11/7/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
1,1,2,2-Tetrachloroethane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
1,1,2-Trichloroethane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
1,1-Dichloroethane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
1,1-Dichloroethene	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
1,2-Dichloroethane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
1,2-Dichloropropane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
2-Butanone	ug/L	-	-	ND(5.0)	-	-	ND(5.0)	-
2-Hexanone	ug/L	-	-	ND(5.0)	-	-	ND(5.0)	-
4-Methyl-2-pentanone	ug/L	-	-	ND(5.0)	-	-	ND(5.0)	-
Acetone	ug/L	-	-	ND(5.0)	-	-	ND(5.0)	-
Benzene	ug/L	-	-	27	-	-	34	-
Bromodichloromethane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Bromoform	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Bromomethane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Carbon disulfide	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Carbon tetrachloride	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Chlorobenzene	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Chlorobromomethane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Chloroethane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Chloroform	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Chloromethane	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
cis-1,2-Dichloroethene	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
cis-1,3-Dichloropropene	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Methylene chloride	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Styrene	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Tetrachloroethene	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Toluene	ug/L	-	-	4.2	-	-	3.6	-
trans-1,2-Dichloroethene	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
trans-1,3-Dichloropropene	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Trichloroethene	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Vinyl chloride	ug/L	-	-	ND(1.0)	-	-	ND(1.0)	-
Xylene (total)	ug/L	-	-	7.5	-	-	6.8	-
Semi -Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	ND(100)	-	-	ND(200)	-
1,2-Dichlorobenzene	ug/L	-	-	ND(100)	-	-	ND(200)	-
1,3-Dichlorobenzene	ug/L	-	-	ND(100)	-	-	ND(200)	-
1,4-Dichlorobenzene	ug/L	-	-	ND(100)	-	-	ND(200)	-
2,4,5-Trichlorophenol	ug/L	-	-	ND(250)	-	-	ND(500)	-
2,4,6-Trichlorophenol	ug/L	-	-	ND(100)	-	-	ND(200)	-
2,4-Dichlorophenol	ug/L	-	-	ND(100)	-	-	ND(200)	-
2,4-Dimethylphenol	ug/L	-	-	100	-	-	210	-
2,4-Dinitrophenol	ug/L	-	-	ND(250)	-	-	ND(500)	-
2,4-Dinitrotoluene	ug/L	-	-	ND(100)	-	-	ND(200)	-
2,6-Dinitrotoluene	ug/L	-	-	ND(100)	-	-	ND(200)	-
2-Chloronaphthalene	ug/L	-	-	ND(100)	-	-	ND(200)	-
2-Chlorophenol	ug/L	-	-	ND(100)	-	-	ND(200)	

GROUNDWATER ANALYTICAL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*
Sample ID:		*GW-102600-WP-277*	*GW-102800-WP-315*	*GW-103000-WP-358*	*GW-110100-WP-391*	*GW-110300-WP-424*	*GW-110500-WP-457*	*GW-110700-WP-483*
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*	*11/7/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	ND(100)	-	-	ND(200)	-
2-Methylphenol	ug/L	-	-	210	-	-	500	-
2-Nitroaniline	ug/L	-	-	ND(250)	-	-	ND(500)	-
2-Nitrophenol	ug/L	-	-	ND(100)	-	-	ND(200)	-
3,3'-Dichlorobenzidine	ug/L	-	-	ND(100)	-	-	ND(200)	-
3-Nitroaniline	ug/L	-	-	ND(250)	-	-	ND(500)	-
4,6-Dinitro-2-methylphenol	ug/L	-	-	ND(250)	-	-	ND(500)	-
4-Bromophenyl phenyl ether	ug/L	-	-	ND(100)	-	-	ND(200)	-
4-Chloro-3-methylphenol	ug/L	-	-	ND(100)	-	-	ND(200)	-
4-Chloroaniline	ug/L	-	-	ND(100)	-	-	ND(200)	-
4-Chlorophenyl phenyl ether	ug/L	-	-	ND(100)	-	-	ND(200)	-
4-Methylphenol	ug/L	-	-	590	-	-	1400	-
4-Nitroaniline	ug/L	-	-	ND(250)	-	-	ND(500)	-
4-Nitrophenol	ug/L	-	-	ND(250)	-	-	ND(500)	-
Acenaphthene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Acenaphthylene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Anthracene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Benzo(a)anthracene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Benzo(a)pyrene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Benzo(b)fluoranthene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Benzo(g,h,i)perylene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Benzo(k)fluoranthene	ug/L	-	-	ND(100)	-	-	ND(200)	-
bis(2-Chloroethoxy)methane	ug/L	-	-	ND(100)	-	-	ND(200)	-
bis(2-Chloroethyl)ether	ug/L	-	-	ND(100)	-	-	ND(200)	-
bis(2-Chloroisopropyl)ether	ug/L	-	-	ND(100)	-	-	ND(200)	-
bis(2-Ethylhexyl)phthalate	ug/L	-	-	ND(100)	-	-	ND(200)	-
Butyl benzylphthalate	ug/L	-	-	ND(100)	-	-	ND(200)	-
Carbazole	ug/L	-	-	ND(100)	-	-	ND(200)	-
Chrysene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Dibenz(a,h)anthracene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Dibenzofuran	ug/L	-	-	ND(100)	-	-	ND(200)	-
Diethyl phthalate	ug/L	-	-	ND(100)	-	-	ND(200)	-
Dimethyl phthalate	ug/L	-	-	ND(100)	-	-	ND(200)	-
Di-n-butylphthalate	ug/L	-	-	ND(100)	-	-	ND(200)	-
Di-n-octyl phthalate	ug/L	-	-	ND(100)	-	-	ND(200)	-
Fluoranthene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Fluorene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Hexachlorobenzene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Hexachlorobutadiene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Hexachlorocyclopentadiene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Hexachloroethane	ug/L	-	-	ND(100)	-	-	ND(200)	-
Indeno(1,2,3-cd)pyrene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Isophorone	ug/L	-	-	ND(100)	-	-	ND(200)	-
Naphthalene	ug/L	-	-	500	-	-	600	-
Nitrobenzene	ug/L	-	-	ND(100)	-	-	ND(200)	-
N-Nitrosodi-n-propylamine	ug/L	-	-	ND(100)	-	-	ND(200)	-
N-Nitrosodiphenylamine	ug/L	-	-	ND(100)	-	-	ND(200)	-
Pentachlorophenol	ug/L	-	-	ND(250)	-	-	ND(500)	-
Phenanthrene	ug/L	-	-	ND(100)	-	-	ND(200)	-
Phenol	ug/L	-	-	670	-	-	1300	-
Pyrene	ug/L	-	-	ND(100)	-	-	ND(200)	-

TABLE F.8

GROUNDWATER ANALYTICAL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*
Sample ID:		*GW-102600-WP-277*	*GW-102800-WP-315*	*GW-103000-WP-358*	*GW-110100-WP-391*	*GW-110300-WP-424*	*GW-110500-WP-457*	*GW-110700-WP-483*
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*	*11/7/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	120	130	110	140	240	350	370
General Chemistry								
Ammonia	mg/L	67	60	65	55	54	48	42
Cyanide (total)	mg/L	-	-	0.047	-	-	0.029	-
Phenolics (Total)	mg/L	4.9	3.8	3.7	4.5	4.9	6.8	6.1
Thiocyanate	mg/L	-	-	43	-	-	11	-

GROUNDWATER ANALYTICAL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*
Sample ID:		*GW-110900-WP-510*	*GW-111200-WP-550*	*GW-111400-WP-583*	*GW-111600-WP-616*	*GW-111700-WP-629*	*GW-111900-WP-661*	*GW-112700-WP-690*
Sample Date:		*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
1,1,2-Trichloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
1,1-Dichloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
1,1-Dichloroethene	ug/L	-	-	-	-	-	-	ND(1.0)
1,2-Dichloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
1,2-Dichloropropane	ug/L	-	-	-	-	-	-	ND(1.0)
2-Butanone	ug/L	-	-	-	-	-	-	ND(5.0)
2-Hexanone	ug/L	-	-	-	-	-	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	-	-	-	-	-	ND(5.0)
Acetone	ug/L	-	-	-	-	-	-	5.9
Benzene	ug/L	-	-	-	-	-	-	41
Bromodichloromethane	ug/L	-	-	-	-	-	-	ND(1.0)
Bromoform	ug/L	-	-	-	-	-	-	ND(1.0)
Bromomethane	ug/L	-	-	-	-	-	-	ND(1.0)
Carbon disulfide	ug/L	-	-	-	-	-	-	ND(1.0)
Carbon tetrachloride	ug/L	-	-	-	-	-	-	ND(1.0)
Chlorobenzene	ug/L	-	-	-	-	-	-	ND(1.0)
Chlorobromomethane	ug/L	-	-	-	-	-	-	ND(1.0)
Chloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
Chloroform	ug/L	-	-	-	-	-	-	ND(1.0)
Chloromethane	ug/L	-	-	-	-	-	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	-	-	-	-	ND(1.0)
Methylene chloride	ug/L	-	-	-	-	-	-	ND(1.0)
Styrene	ug/L	-	-	-	-	-	-	ND(1.0)
Tetrachloroethene	ug/L	-	-	-	-	-	-	ND(1.0)
Toluene	ug/L	-	-	-	-	-	-	3.2
trans-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	ND(1.0)
Trichloroethene	ug/L	-	-	-	-	-	-	ND(1.0)
Vinyl chloride	ug/L	-	-	-	-	-	-	ND(1 0)
Xylene (total)	ug/L	-	-	-	-	-	-	5.6
Semi -Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	-	-	-	-	ND(100)
1,2-Dichlorobenzene	ug/L	-	-	-	-	-	-	ND(100)
1,3-Dichlorobenzene	ug/L	-	-	-	-	-	-	ND(100)
1,4-Dichlorobenzene	ug/L	-	-	-	-	-	-	ND(100)
2,4,5-Trichlorophenol	ug/L	-	-	-	-	-	-	ND(250)
2,4,6-Trichlorophenol	ug/L	-	-	-	-	-	-	ND(100)
2,4-Dichlorophenol	ug/L	-	-	-	-	-	-	ND(100)
2,4-Dimethylphenol	ug/L	-	-	-	-	-	-	180
2,4-Dinitrophenol	ug/L	-	-	-	-	-	-	ND(250)
2,4-Dinitrotoluene	ug/L	-	-	-	-	-	-	ND(100)
2,6-Dinitrotoluene	ug/L	-	-	-	-	-	-	ND(100)
2-Chloronaphthalene	ug/L	-	-	-	-	-	-	ND(100)
2-Chlorophenol	ug/L	-	-	-	-	-	-	ND(100)

TABLE F.8

GROUNDWATER ANALYTICAL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*
Sample ID:		*GW-110900-WP-510*	*GW-111200-WP-550*	*GW-111400-WP-583*	*GW-111600-WP-616*	*GW-111700-WP-629*	*GW-111900-WP-661*	*GW-112700-WP-690*
Sample Date:		*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	-	-	-	-	ND(100)
2-Methylphenol	ug/L	-	-	-	-	-	-	410
2-Nitroaniline	ug/L	-	-	-	-	-	-	ND(250)
2-Nitrophenol	ug/L	-	-	-	-	-	-	ND(100)
3,3'-Dichlorobenzidine	ug/L	-	-	-	-	-	-	ND(100)
3-Nitroaniline	ug/L	-	-	-	-	-	-	ND(250)
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	-	-	-	ND(250)
4-Bromophenyl phenyl ether	ug/L	-	-	-	-	-	-	ND(100)
4-Chloro-3-methylphenol	ug/L	-	-	-	-	-	-	ND(100)
4-Chloroaniline	ug/L	-	-	-	-	-	-	ND(100)
4-Chlorophenyl phenyl ether	ug/L	-	-	-	-	-	-	ND(100)
4-Methylphenol	ug/L	-	-	-	-	-	-	780
4-Nitroaniline	ug/L	-	-	-	-	-	-	ND(250)
4-Nitrophenol	ug/L	-	-	-	-	-	-	ND(250)
Acenaphthene	ug/L	-	-	-	-	-	-	ND(100)
Acenaphthylene	ug/L	-	-	-	-	-	-	ND(100)
Anthracene	ug/L	-	-	-	-	-	-	ND(100)
Benzo(a)anthracene	ug/L	-	-	-	-	-	-	ND(100)
Benzo(a)pyrene	ug/L	-	-	-	-	-	-	ND(100)
Benzo(b)fluoranthene	ug/L	-	-	-	-	-	-	ND(100)
Benzo(g,h,i)perylene	ug/L	-	-	-	-	-	-	ND(100)
Benzo(k)fluoranthene	ug/L	-	-	-	-	-	-	ND(100)
bis(2-Chloroethoxy)methane	ug/L	-	-	-	-	-	-	ND(100)
bis(2-Chloroethyl)ether	ug/L	-	-	-	-	-	-	ND(100)
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	-	-	-	ND(100)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	-	-	-	ND(100)
Butyl benzylphthalate	ug/L	-	-	-	-	-	-	ND(100)
Carbazole	ug/L	-	-	-	-	-	-	ND(100)
Chrysene	ug/L	-	-	-	-	-	-	ND(100)
Dibenz(a,h)anthracene	ug/L	-	-	-	-	-	-	ND(100)
Dibenzofuran	ug/L	-	-	-	-	-	-	ND(100)
Diethyl phthalate	ug/L	-	-	-	-	-	-	ND(100)
Dimethyl phthalate	ug/L	-	-	-	-	-	-	ND(100)
Di-n-butylphthalate	ug/L	-	-	-	-	-	-	ND(100)
Di-n-octyl phthalate	ug/L	-	-	-	-	-	-	ND(100)
Fluoranthene	ug/L	-	-	-	-	-	-	ND(100)
Fluorene	ug/L	-	-	-	-	-	-	ND(100)
Hexachlorobenzene	ug/L	-	-	-	-	-	-	ND(100)
Hexachlorobutadiene	ug/L	-	-	-	-	-	-	ND(100)
Hexachlorocyclopentadiene	ug/L	-	-	-	-	-	-	ND(100)
Hexachloroethane	ug/L	-	-	-	-	-	-	ND(100)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	-	-	-	ND(100)
Isophorone	ug/L	-	-	-	-	-	-	ND(100)
Naphthalene	ug/L	-	-	-	-	-	-	470
Nitrobenzene	ug/L	-	-	-	-	-	-	ND(100)
N-Nitrosodi-n-propylamine	ug/L	-	-	-	-	-	-	ND(100)
N-Nitrosodiphenylamine	ug/L	-	-	-	-	-	-	ND(100)
Pentachlorophenol	ug/L	-	-	-	-	-	-	ND(250)
Phenanthrene	ug/L	-	-	-	-	-	-	ND(100)
Phenol	ug/L	-	-	-	-	-	-	820
Pyrene	ug/L	-	-	-	-	-	-	ND(100)

GROUNDWATER ANAL. _AL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*	*WN-2C*
Sample ID:		*GW-110900-WP-510*	*GW-111200-WP-550*	*GW-111400-WP-583*	*GW-111600-WP-616*	*GW-111700-WP-629*	*GW-111900-WP-661*	*GW-112700-WP-690*
Sample Date:		*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	360	280	330	350	330	330	340
General Chemistry								
Ammonia	mg/L	39	40	35	37	32	35	36
Cyanide (total)	mg/L	-	-	-	-	-	-	ND(0.010)
Phenolics (Total)	mg/L	6.8	5.9	5.2	2.5	2.0	4.2	3.9
Thiocyanate	mg/L	-	-	-	-	-	-	25

TABLE F.8

GROUNDWATER ANALYTICAL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2C*
Sample ID:		*GW-121800-WP-706*
Sample Date:		*12/18/2000*
Parameter	*Unit*	
Volatiles		
1,1,1-Trichloroethane	ug/L	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(1.0)
1,1-Dichloroethane	ug/L	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)
2-Butanone	ug/L	ND(5.0)
2-Hexanone	ug/L	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(5.0)
Acetone	ug/L	ND(5.0)
Benzene	ug/L	26
Bromodichloromethane	ug/L	ND(1.0)
Bromoform	ug/L	ND(1.0)
Bromomethane	ug/L	ND(1.0)
Carbon disulfide	ug/L	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)
Chlorobromomethane	ug/L	-
Chloroethane	ug/L	ND(1.0)
Chloroform	ug/L	ND(1.0)
Chloromethane	ug/L	1.8
cis-1,2-Dichloroethene	ug/L	ND(1 0)
cis-1,3-Dichloropropene	ug/L	ND(1.0)
Dibromochloromethane	ug/L	ND(1.0)
Ethylbenzene	ug/L	ND(1.0)
Methylene chloride	ug/L	ND(1.0)
Styrene	ug/L	ND(1 0)
Tetrachloroethene	ug/L	ND(1.0)
Toluene	ug/L	3.3
trans-1,2-Dichloroethene	ug/L	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)
Trichloroethene	ug/L	ND(1.0)
Vinyl chloride	ug/L	ND(2.0)
Xylene (total)	ug/L	3.9
Semi -Volatiles		
1,2,4-Trichlorobenzene	ug/L	ND(30)
1,2-Dichlorobenzene	ug/L	ND(30)
1,3-Dichlorobenzene	ug/L	ND(30)
1,4-Dichlorobenzene	ug/L	ND(30)
2,4,5-Trichlorophenol	ug/L	ND(75)
2,4,6-Trichlorophenol	ug/L	ND(30)
2,4-Dichlorophenol	ug/L	ND(30)
2,4-Dimethylphenol	ug/L	94
2,4-Dinitrophenol	ug/L	ND(75)
2,4-Dinitrotoluene	ug/L	ND(30)
2,6-Dinitrotoluene	ug/L	ND(30)
2-Chloronaphthalene	ug/L	ND(30)
2-Chlorophenol	ug/L	ND(30)

GROUNDWATER ANALYTICAL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2C*
Sample ID:		*GW-121800-WP-706*
Sample Date:		*12/18/2000*
Parameter	*Unit*	
2-Methyl naphthalene	ug/L	ND(30)
2-Methylphenol	ug/L	220
2-Nitroaniline	ug/L	ND(75)
2-Nitrophenol	ug/L	ND(30)
3,3'-Dichlorobenzidine	ug/L	ND(30)
3-Nitroaniline	ug/L	ND(75)
4,6-Dinitro-2-methylphenol	ug/L	ND(75)
4-Bromophenyl phenyl ether	ug/L	ND(30)
4-Chloro-3-methylphenol	ug/L	ND(30)
4-Chloroaniline	ug/L	ND(30)
4-Chlorophenyl phenyl ether	ug/L	ND(30)
4-Methylphenol	ug/L	160
4-Nitroaniline	ug/L	ND(75)
4-Nitrophenol	ug/L	ND(75)
Acenaphthene	ug/L	ND(30)
Acenaphthylene	ug/L	ND(30)
Anthracene	ug/L	ND(30)
Benzo(a)anthracene	ug/L	ND(30)
Benzo(a)pyrene	ug/L	ND(30)
Benzo(b)fluoranthene	ug/L	ND(30)
Benzo(g,h,i)perylene	ug/L	ND(30)
Benzo(k)fluoranthene	ug/L	ND(30)
bis(2-Chloroethoxy)methane	ug/L	ND(30)
bis(2-Chloroethyl)ether	ug/L	ND(30)
bis(2-Chloroisopropyl)ether	ug/L	ND(30)
bis(2-Ethylhexyl)phthalate	ug/L	ND(30)
Butyl benzylphthalate	ug/L	ND(30)
Carbazole	ug/L	ND(30)
Chrysene	ug/L	ND(30)
Dibenz(a,h)anthracene	ug/L	ND(30)
Dibenzofuran	ug/L	ND(30)
Diethyl phthalate	ug/L	ND(30)
Dimethyl phthalate	ug/L	ND(30)
Di-n-butylphthalate	ug/L	ND(30)
Di-n-octyl phthalate	ug/L	ND(30)
Fluoranthene	ug/L	ND(30)
Fluorene	ug/L	ND(30)
Hexachlorobenzene	ug/L	ND(30)
Hexachlorobutadiene	ug/L	ND(30)
Hexachlorocyclopentadiene	ug/L	ND(30)
Hexachloroethane	ug/L	ND(30)
Indeno(1,2,3-cd)pyrene	ug/L	ND(30)
Isophorone	ug/L	ND(30)
Naphthalene	ug/L	400
Nitrobenzene	ug/L	ND(30)
N-Nitrosodi-n-propylamine	ug/L	ND(30)
N-Nitrosodiphenylamine	ug/L	ND(30)
Pentachlorophenol	ug/L	ND(75)
Phenanthrene	ug/L	ND(30)
Phenol	ug/L	ND(30)
Pyrene	ug/L	ND(30)

GROUNDWATER ANALYTICAL RESULTS - WN-2C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*WN-2C*
Sample ID:		*GW-121800-WP-706*
Sample Date:		*12/18/2000*
Parameter	***Unit***	
Metals		
Arsenic	ug/L	200
General Chemistry		
Ammonia	mg/L	34
Cyanide (total)	mg/L	0.048
Phenolics (Total)	mg/L	0.62
Thiocyanate	mg/L	200

GROUNDWATER ANALYTICAL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*
Sample ID:		*GW-100800-WP-030*	*GW-101100-WP-068*	*GW-101300-WP-096*	*GW-101500-WP-124*	*GW-101800-WP-163*	*GW-102000-WP-188*	*GW-102200-WP-208*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
1,1,2-Trichloroethane	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
1,1-Dichloroethane	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
1,1-Dichloroethene	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
1,2-Dichloroethane	ug/L	ND(10)	ND(1 0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
1,2-Dichloropropane	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
2-Butanone	ug/L	74	17	ND(50)	ND(50)	16	ND(50)	ND(50)
2-Hexanone	ug/L	ND(50)	ND(5.0)	ND(50)	ND(50)	ND(10)	ND(50)	ND(50)
4-Methyl-2-pentanone	ug/L	ND(50)	ND(5.0)	ND(50)	ND(50)	ND(10)	ND(50)	ND(50)
Acetone	ug/L	370	100	76	54	81	73	ND(50)
Benzene	ug/L	850	360	260	240	210	230	210
Bromodichloromethane	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Bromoform	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Bromomethane	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Carbon disulfide	ug/L	15	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Carbon tetrachloride	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Chlorobenzene	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Chlorobromomethane	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Chloroethane	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Chloroform	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Chloromethane	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
cis-1,2-Dichloroethene	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
cis-1,3-Dichloropropene	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(10)	4.0	ND(10)	ND(10)	2.5	ND(10)	ND(10)
Methylene chloride	ug/L	ND(10)	ND(1 0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Styrene	ug/L	34	18	11	11	11	10	ND(10)
Tetrachloroethene	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Toluene	ug/L	260	160	110	110	110	120	110
trans-1,2-Dichloroethene	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
trans-1,3-Dichloropropene	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Trichloroethene	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Vinyl chloride	ug/L	ND(10)	ND(1.0)	ND(10)	ND(10)	ND(2.0)	ND(10)	ND(10)
Xylene (total)	ug/L	160	95	66	59	54	67	59
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
1,2-Dichlorobenzene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
1,3-Dichlorobenzene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
1,4-Dichlorobenzene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
2,4,5-Trichlorophenol	ug/L	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(5000)	ND(2500)
2,4,6-Trichlorophenol	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
2,4-Dichlorophenol	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
2,4-Dimethylphenol	ug/L	19000	7700	7500	ND(5000)	ND(5000)	2400	1800
2,4-Dinitrophenol	ug/L	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(5000)	ND(2500)
2,4-Dinitrotoluene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
2,6-Dinitrotoluene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
2-Chloronaphthalene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
2-Chlorophenol	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)

GROUNDWATER ANALYTICAL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*
Sample ID:		*GW-100800-WP-030*	*GW-101100-WP-068*	*GW-101300-WP-096*	*GW-101500-WP-124*	*GW-101800-WP-163*	*GW-102000-WP-188*	*GW-102200-WP-208*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
2-Methylphenol	ug/L	48000	18000	18000	10000	8600	5700	3600
2-Nitroaniline	ug/L	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(5000)	ND(2500)
2-Nitrophenol	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
3,3'-Dichlorobenzidine	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
3-Nitroaniline	ug/L	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(5000)	ND(2500)
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(5000)	ND(2500)
4-Bromophenyl phenyl ether	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
4-Chloro-3-methylphenol	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
4-Chloroaniline	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
4-Methylphenol	ug/L	230000	50000	55000	33000	27000	17000	11000
4-Nitroaniline	ug/L	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(5000)	ND(2500)
4-Nitrophenol	ug/L	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(5000)	ND(2500)
Acenaphthene	ug/L	ND(5000) UJ	ND(5000) UJ	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Acenaphthylene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Anthracene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Benzo(a)anthracene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Benzo(a)pyrene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Benzo(b)fluoranthene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Benzo(g,h,i)perylene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Benzo(k)fluoranthene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
bis(2-Chloroethyl)ether	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Butyl benzylphthalate	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Carbazole	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Chrysene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Dibenz(a,h)anthracene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Dibenzofuran	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Diethyl phthalate	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Dimethyl phthalate	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Di-n-butylphthalate	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Di-n-octyl phthalate	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Fluoranthene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Fluorene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Hexachlorobenzene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Hexachlorobutadiene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Hexachlorocyclopentadiene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Hexachloroethane	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Isophorone	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Naphthalene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Nitrobenzene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
N-Nitrosodiphenylamine	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Pentachlorophenol	ug/L	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(13000)	ND(5000)	ND(2500)
Phenanthrene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)
Phenol	ug/L	300000	66000	67000	46000	34000	20000	12000
Pyrene	ug/L	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(5000)	ND(2000)	ND(1000)

TABLE F.9

GROUNDWATER ANALYTICAL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*
Sample ID:		*GW-100800-WP-030*	*GW-101100-WP-068*	*GW-101300-WP-096*	*GW-101500-WP-124*	*GW-101800-WP-163*	*GW-102000-WP-188*	*GW-102200-WP-208*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	6300	3800	2300	2300	2300	1700	-
General Chemistry								
Ammonia	mg/L	1600	860	550	300	480 J	300 J	170
Cyanide (total)	mg/L	0.76 J	0.33	0.18	0.13	0.066 J	0.077	ND(0.010)
Phenolics (Total)	mg/L	1300	380	140	220 J	180	100	44
Thiocyanate	mg/L	6600	860	770	560	420	230	-

TABLE F.9

GROUNDWATER ANALYTICAL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*
Sample ID:		*GW-102600-WP-278*	*GW-102800-WP-316*	*GW-103000-WP-359*	*GW-110100-WP-392*	*GW-110300-WP-425*	*GW-110500-WP-458*	*GW-110700-WP-484*
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*	*11/7/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
1,1,2,2-Tetrachloroethane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
1,1,2-Trichloroethane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
1,1-Dichloroethane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
1,1-Dichloroethene	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
1,2-Dichloroethane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
1,2-Dichloropropane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
2-Butanone	ug/L	-	-	ND(50)	-	-	ND(5.0)	-
2-Hexanone	ug/L	-	-	ND(50)	-	-	ND(5.0)	-
4-Methyl-2-pentanone	ug/L	-	-	ND(50)	-	-	ND(5.0)	-
Acetone	ug/L	-	-	ND(50)	-	-	10	-
Benzene	ug/L	-	-	78	-	-	83	-
Bromodichloromethane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Bromoform	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Bromomethane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Carbon disulfide	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Carbon tetrachloride	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Chlorobenzene	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Chlorobromomethane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Chloroethane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Chloroform	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Chloromethane	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
cis-1,2-Dichloroethene	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
cis-1,3-Dichloropropene	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	ND(10)	-	-	1.3	-
Methylene chloride	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Styrene	ug/L	-	-	ND(10)	-	-	4.9	-
Tetrachloroethene	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Toluene	ug/L	-	-	44	-	-	47	-
trans-1,2-Dichloroethene	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
trans-1,3-Dichloropropene	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Trichloroethene	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Vinyl chloride	ug/L	-	-	ND(10)	-	-	ND(1.0)	-
Xylene (total)	ug/L	-	-	28	-	-	32	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	ND(500)	-	-	ND(500)	-
1,2-Dichlorobenzene	ug/L	-	-	ND(500)	-	-	ND(500)	-
1,3-Dichlorobenzene	ug/L	-	-	ND(500)	-	-	ND(500)	-
1,4-Dichlorobenzene	ug/L	-	-	ND(500)	-	-	ND(500)	-
2,4,5-Trichlorophenol	ug/L	-	-	ND(1300)	-	-	ND(1300)	-
2,4,6-Trichlorophenol	ug/L	-	-	ND(500)	-	-	ND(500)	-
2,4-Dichlorophenol	ug/L	-	-	ND(500)	-	-	ND(500)	-
2,4-Dimethylphenol	ug/L	-	-	1000	-	-	970	-
2,4-Dinitrophenol	ug/L	-	-	ND(1300)	-	-	ND(1300)	-
2,4-Dinitrotoluene	ug/L	-	-	ND(500)	-	-	ND(500)	-
2,6-Dinitrotoluene	ug/L	-	-	ND(500)	-	-	ND(500)	-
2-Chloronaphthalene	ug/L	-	-	ND(500)	-	-	ND(500)	-
2-Chlorophenol	ug/L	-	-	ND(500)	-	-	ND(500)	

TABLE F.9

GROUNDWATER ANAL. .AL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*
Sample ID:		*GW-102600-WP-278*	*GW-102800-WP-316*	*GW-103000-WP-359*	*GW-110100-WP-392*	*GW-110300-WP-425*	*GW-110500-WP-458*	*GW-110700-WP-484*
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*	*11/7/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	ND(500)	-	-	ND(500)	-
2-Methylphenol	ug/L	-	-	1300	-	-	1200	-
2-Nitroaniline	ug/L	-	-	ND(1300)	-	-	ND(1300)	-
2-Nitrophenol	ug/L	-	-	ND(500)	-	-	ND(500)	-
3,3'-Dichlorobenzidine	ug/L	-	-	ND(500)	-	-	ND(500)	-
3-Nitroaniline	ug/L	-	-	ND(1300)	-	-	ND(1300)	-
4,6-Dinitro-2-methylphenol	ug/L	-	-	ND(1300)	-	-	ND(1300)	-
4-Bromophenyl phenyl ether	ug/L	-	-	ND(500)	-	-	ND(500)	-
4-Chloro-3-methylphenol	ug/L	-	-	ND(500)	-	-	ND(500)	-
4-Chloroaniline	ug/L	-	-	ND(500)	-	-	ND(500)	-
4-Chlorophenyl phenyl ether	ug/L	-	-	ND(500)	-	-	ND(500)	-
4-Methylphenol	ug/L	-	-	4100	-	-	3700	-
4-Nitroaniline	ug/L	-	-	ND(1300)	-	-	ND(1300)	-
4-Nitrophenol	ug/L	-	-	ND(1300)	-	-	ND(1300)	-
Acenaphthene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Acenaphthylene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Anthracene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Benzo(a)anthracene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Benzo(a)pyrene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Benzo(b)fluoranthene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Benzo(g,h,i)perylene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Benzo(k)fluoranthene	ug/L	-	-	ND(500)	-	-	ND(500)	-
bis(2-Chloroethoxy)methane	ug/L	-	-	ND(500)	-	-	ND(500)	-
bis(2-Chloroethyl)ether	ug/L	-	-	ND(500)	-	-	ND(500)	-
bis(2-Chloroisopropyl)ether	ug/L	-	-	ND(500)	-	-	ND(500)	-
bis(2-Ethylhexyl)phthalate	ug/L	-	-	ND(500)	-	-	ND(500)	-
Butyl benzylphthalate	ug/L	-	-	ND(500)	-	-	ND(500)	-
Carbazole	ug/L	-	-	ND(500)	-	-	ND(500)	-
Chrysene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Dibenz(a,h)anthracene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Dibenzofuran	ug/L	-	-	ND(500)	-	-	ND(500)	-
Diethyl phthalate	ug/L	-	-	ND(500)	-	-	ND(500)	-
Dimethyl phthalate	ug/L	-	-	ND(500)	-	-	ND(500)	-
Di-n-butylphthalate	ug/L	-	-	ND(500)	-	-	ND(500)	-
Di-n-octyl phthalate	ug/L	-	-	ND(500)	-	-	ND(500)	-
Fluoranthene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Fluorene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Hexachlorobenzene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Hexachlorobutadiene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Hexachlorocyclopentadiene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Hexachloroethane	ug/L	-	-	ND(500)	-	-	ND(500)	-
Indeno(1,2,3-cd)pyrene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Isophorone	ug/L	-	-	ND(500)	-	-	ND(500)	-
Naphthalene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Nitrobenzene	ug/L	-	-	ND(500)	-	-	ND(500)	-
N-Nitrosodi-n-propylamine	ug/L	-	-	ND(500)	-	-	ND(500)	-
N-Nitrosodiphenylamine	ug/L	-	-	ND(500)	-	-	ND(500)	-
Pentachlorophenol	ug/L	-	-	ND(1300)	-	-	ND(1300)	-
Phenanthrene	ug/L	-	-	ND(500)	-	-	ND(500)	-
Phenol	ug/L	-	-	3000	-	-	3200	-
Pyrene	ug/L	-	-	ND(500)	-	-	ND(500)	-

TABLE F.9

GROUNDWATER ANALYTICAL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*
Sample ID:		*GW-102600-WP-278*	*GW-102800-WP-316*	*GW-103000-WP-359*	*GW-110100-WP-392*	*GW-110300-WP-425*	*GW-110500-WP-458*	*GW-110700-WP-484*
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*	*11/7/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	710	620	630	520	440	530	530
General Chemistry								
Ammonia	mg/L	150	120	100	110	110	100	85
Cyanide (total)	mg/L	-	-	0.037	-	-	ND(0.010)	-
Phenolics (Total)	mg/L	26	19	15	14	11	14	12
Thiocyanate	mg/L	-	-	61	-	-	41	-

GROUNDWATER ANALYTICAL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*
Sample ID:		*GW-110900-WP-511*	*GW-111200-WP-551*	*GW-111400-WP-584*	*GW-111600-WP-617*	*GW-111700-WP-630*	*GW-111900-WP-662*	*GW-112700-WP-691*
Sample Date:		*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
1,1,2-Trichloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
1,1-Dichloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
1,1-Dichloroethene	ug/L	-	-	-	-	-	-	ND(1.0)
1,2-Dichloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
1,2-Dichloropropane	ug/L	-	-	-	-	-	-	ND(1.0)
2-Butanone	ug/L	-	-	-	-	-	-	ND(5.0)
2-Hexanone	ug/L	-	-	-	-	-	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	-	-	-	-	-	ND(5.0)
Acetone	ug/L	-	-	-	-	-	-	ND(5.0)
Benzene	ug/L	-	-	-	-	-	-	74
Bromodichloromethane	ug/L	-	-	-	-	-	-	ND(1.0)
Bromoform	ug/L	-	-	-	-	-	-	ND(1.0)
Bromomethane	ug/L	-	-	-	-	-	-	ND(1.0)
Carbon disulfide	ug/L	-	-	-	-	-	-	ND(1.0)
Carbon tetrachloride	ug/L	-	-	-	-	-	-	ND(1.0)
Chlorobenzene	ug/L	-	-	-	-	-	-	ND(1.0)
Chlorobromomethane	ug/L	-	-	-	-	-	-	ND(1.0)
Chloroethane	ug/L	-	-	-	-	-	-	ND(1.0)
Chloroform	ug/L	-	-	-	-	-	-	ND(1.0)
Chloromethane	ug/L	-	-	-	-	-	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	-	-	-	-	1.1
Methylene chloride	ug/L	-	-	-	-	-	-	ND(1.0)
Styrene	ug/L	-	-	-	-	-	-	4.2
Tetrachloroethene	ug/L	-	-	-	-	-	-	ND(1.0)
Toluene	ug/L	-	-	-	-	-	-	44
trans-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	ND(1.0)
Trichloroethene	ug/L	-	-	-	-	-	-	ND(1.0)
Vinyl chloride	ug/L	-	-	-	-	-	-	ND(1.0)
Xylene (total)	ug/L	-	-	-	-	-	-	28
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	-	-	-	-	ND(500)
1,2-Dichlorobenzene	ug/L	-	-	-	-	-	-	ND(500)
1,3-Dichlorobenzene	ug/L	-	-	-	-	-	-	ND(500)
1,4-Dichlorobenzene	ug/L	-	-	-	-	-	-	ND(500)
2,4,5-Trichlorophenol	ug/L	-	-	-	-	-	-	ND(1300)
2,4,6-Trichlorophenol	ug/L	-	-	-	-	-	-	ND(500)
2,4-Dichlorophenol	ug/L	-	-	-	-	-	-	ND(500)
2,4-Dimethylphenol	ug/L	-	-	-	-	-	-	860
2,4-Dinitrophenol	ug/L	-	-	-	-	-	-	ND(1300)
2,4-Dinitrotoluene	ug/L	-	-	-	-	-	-	ND(500)
2,6-Dinitrotoluene	ug/L	-	-	-	-	-	-	ND(500)
2-Chloronaphthalene	ug/L	-	-	-	-	-	-	ND(500)
2-Chlorophenol	ug/L	-	-	-	-	-	-	ND(500)

TABLE F.9

GROUNDWATER ANALYTICAL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*
Sample ID:		*GW-110900-WP-511*	*GW-111200-WP-551*	*GW-111400-WP-584*	*GW-111600-WP-617*	*GW-111700-WP-630*	*GW-111900-WP-662*	*GW-112700-WP-691*
Sample Date:		*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	-	-	-	-	ND(500)
2-Methylphenol	ug/L	-	-	-	-	-	-	850
2-Nitroaniline	ug/L	-	-	-	-	-	-	ND(1300)
2-Nitrophenol	ug/L	-	-	-	-	-	-	ND(500)
3,3'-Dichlorobenzidine	ug/L	-	-	-	-	-	-	ND(500)
3-Nitroaniline	ug/L	-	-	-	-	-	-	ND(1300)
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	-	-	-	ND(1300)
4-Bromophenyl phenyl ether	ug/L	-	-	-	-	-	-	ND(500)
4-Chloro-3-methylphenol	ug/L	-	-	-	-	-	-	ND(500)
4-Chloroaniline	ug/L	-	-	-	-	-	-	ND(500)
4-Chlorophenyl phenyl ether	ug/L	-	-	-	-	-	-	ND(500)
4-Methylphenol	ug/L	-	-	-	-	-	-	2400
4-Nitroaniline	ug/L	-	-	-	-	-	-	ND(1300)
4-Nitrophenol	ug/L	-	-	-	-	-	-	ND(1300)
Acenaphthene	ug/L	-	-	-	-	-	-	ND(500)
Acenaphthylene	ug/L	-	-	-	-	-	-	ND(500)
Anthracene	ug/L	-	-	-	-	-	-	ND(500)
Benzo(a)anthracene	ug/L	-	-	-	-	-	-	ND(500)
Benzo(a)pyrene	ug/L	-	-	-	-	-	-	ND(500)
Benzo(b)fluoranthene	ug/L	-	-	-	-	-	-	ND(500)
Benzo(g,h,i)perylene	ug/L	-	-	-	-	-	-	ND(500)
Benzo(k)fluoranthene	ug/L	-	-	-	-	-	-	ND(500)
bis(2-Chloroethoxy)methane	ug/L	-	-	-	-	-	-	ND(500)
bis(2-Chloroethyl)ether	ug/L	-	-	-	-	-	-	ND(500)
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	-	-	-	ND(500)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	-	-	-	ND(500)
Butyl benzylphthalate	ug/L	-	-	-	-	-	-	ND(500)
Carbazole	ug/L	-	-	-	-	-	-	ND(500)
Chrysene	ug/L	-	-	-	-	-	-	ND(500)
Dibenz(a,h)anthracene	ug/L	-	-	-	-	-	-	ND(500)
Dibenzofuran	ug/L	-	-	-	-	-	-	ND(500)
Diethyl phthalate	ug/L	-	-	-	-	-	-	ND(500)
Dimethyl phthalate	ug/L	-	-	-	-	-	-	ND(500)
Di-n-butylphthalate	ug/L	-	-	-	-	-	-	ND(500)
Di-n-octyl phthalate	ug/L	-	-	-	-	-	-	ND(500)
Fluoranthene	ug/L	-	-	-	-	-	-	ND(500)
Fluorene	ug/L	-	-	-	-	-	-	ND(500)
Hexachlorobenzene	ug/L	-	-	-	-	-	-	ND(500)
Hexachlorobutadiene	ug/L	-	-	-	-	-	-	ND(500)
Hexachlorocyclopentadiene	ug/L	-	-	-	-	-	-	ND(500)
Hexachloroethane	ug/L	-	-	-	-	-	-	ND(500)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	-	-	-	ND(500)
Isophorone	ug/L	-	-	-	-	-	-	ND(500)
Naphthalene	ug/L	-	-	-	-	-	-	ND(500)
Nitrobenzene	ug/L	-	-	-	-	-	-	*ND(500)*
N-Nitrosodi-n-propylamine	ug/L	-	-	-	-	-	-	ND(500)
N-Nitrosodiphenylamine	ug/L	-	-	-	-	-	-	ND(500)
Pentachlorophenol	ug/L	-	-	-	-	-	-	ND(1300)
Phenanthrene	ug/L	-	-	-	-	-	-	ND(500)
Phenol	ug/L	-	-	-	-	-	-	1600
Pyrene	ug/L	-	-	-	-	-	-	ND(500)

GROUNDWATER ANALYTICAL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*	*WN-2D*
Sample ID:		*GW-110900-WP-511*	*GW-111200-WP-551*	*GW-111400-WP-584*	*GW-111600-WP-617*	*GW-111700-WP-630*	*GW-111900-WP-662*	*GW-112700-WP-691*
Sample Date:		*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	540	390	450	450	400	380	540
General Chemistry								
Ammonia	mg/L	77	84	66	74	71	77	90
Cyanide (total)	mg/L	-	-	-	-	-	-	0.11 J
Phenolics (Total)	mg/L	9.5	8.1	6.5	4.7	4.0	5.9	7.1
Thiocyanate	mg/L	-	-	-	-	-	-	170

TABLE F.9

GROUNDWATER ANALYTICAL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*
Sample ID:		*GW-121800-WP-707*
Sample Date:		*12/18/2000*
Parameter	***Unit***	
Volatiles		
1,1,1-Trichloroethane	ug/L	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(1.0)
1,1-Dichloroethane	ug/L	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)
2-Butanone	ug/L	ND(5.0)
2-Hexanone	ug/L	ND(5 0)
4-Methyl-2-pentanone	ug/L	ND(5.0)
Acetone	ug/L	6.8
Benzene	ug/L	83
Bromodichloromethane	ug/L	ND(1.0)
Bromoform	ug/L	ND(1.0)
Bromomethane	ug/L	ND(1 0)
Carbon disulfide	ug/L	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)
Chlorobromomethane	ug/L	-
Chloroethane	ug/L	ND(1.0)
Chloroform	ug/L	ND(1.0)
Chloromethane	ug/L	ND(1.0)
cis-1,2-Dichloroethene	ug/L	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(1.0)
Dibromochloromethane	ug/L	ND(1.0)
Ethylbenzene	ug/L	ND(1.0)
Methylene chloride	ug/L	ND(1.0)
Styrene	ug/L	3.2
Tetrachloroethene	ug/L	ND(1.0)
Toluene	ug/L	54
trans-1,2-Dichloroethene	ug/L	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)
Trichloroethene	ug/L	ND(1.0)
Vinyl chloride	ug/L	ND(2.0)
Xylene (total)	ug/L	22
Semi - Volatiles		
1,2,4-Trichlorobenzene	ug/L	ND(200)
1,2-Dichlorobenzene	ug/L	ND(200)
1,3-Dichlorobenzene	ug/L	ND(200)
1,4-Dichlorobenzene	ug/L	ND(200)
2,4,5-Trichlorophenol	ug/L	ND(500)
2,4,6-Trichlorophenol	ug/L	ND(200)
2,4-Dichlorophenol	ug/L	ND(200)
2,4-Dimethylphenol	ug/L	1200
2,4-Dinitrophenol	ug/L	ND(500)
2,4-Dinitrotoluene	ug/L	ND(200)
2,6-Dinitrotoluene	ug/L	ND(200)
2-Chloronaphthalene	ug/L	ND(200)
2-Chlorophenol	ug/L	ND(200)

GROUNDWATER ANAL. .AL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*
Sample ID:		*GW-121800-WP-707*
Sample Date:		*12/18/2000*
Parameter	*Unit*	
2-Methyl naphthalene	ug/L	ND(200)
2-Methylphenol	ug/L	1100
2-Nitroaniline	ug/L	ND(500)
2-Nitrophenol	ug/L	ND(200)
3,3'-Dichlorobenzidine	ug/L	ND(200)
3-Nitroaniline	ug/L	ND(500)
4,6-Dinitro-2-methylphenol	ug/L	ND(500)
4-Bromophenyl phenyl ether	ug/L	ND(200)
4-Chloro-3-methylphenol	ug/L	ND(200)
4-Chloroaniline	ug/L	ND(200)
4-Chlorophenyl phenyl ether	ug/L	ND(200)
4-Methylphenol	ug/L	3100
4-Nitroaniline	ug/L	ND(500)
4-Nitrophenol	ug/L	ND(500)
Acenaphthene	ug/L	ND(200)
Acenaphthylene	ug/L	ND(200)
Anthracene	ug/L	ND(200)
Benzo(a)anthracene	ug/L	ND(200)
Benzo(a)pyrene	ug/L	ND(200)
Benzo(b)fluoranthene	ug/L	ND(200)
Benzo(g,h,i)perylene	ug/L	ND(200)
Benzo(k)fluoranthene	ug/L	ND(200)
bis(2-Chloroethoxy)methane	ug/L	ND(200)
bis(2-Chloroethyl)ether	ug/L	ND(200)
bis(2-Chloroisopropyl)ether	ug/L	ND(200)
bis(2-Ethylhexyl)phthalate	ug/L	ND(200)
Butyl benzylphthalate	ug/L	ND(200)
Carbazole	ug/L	ND(200)
Chrysene	ug/L	ND(200)
Dibenz(a,h)anthracene	ug/L	ND(200)
Dibenzofuran	ug/L	ND(200)
Diethyl phthalate	ug/L	ND(200)
Dimethyl phthalate	ug/L	ND(200)
Di-n-butylphthalate	ug/L	ND(200)
Di-n-octyl phthalate	ug/L	ND(200)
Fluoranthene	ug/L	ND(200)
Fluorene	ug/L	ND(200)
Hexachlorobenzene	ug/L	ND(200)
Hexachlorobutadiene	ug/L	ND(200)
Hexachlorocyclopentadiene	ug/L	ND(200)
Hexachloroethane	ug/L	ND(200)
Indeno(1,2,3-cd)pyrene	ug/L	ND(200)
Isophorone	ug/L	ND(200)
Naphthalene	ug/L	370
Nitrobenzene	ug/L	ND(200)
N-Nitrosodi-n-propylamine	ug/L	ND(200)
N-Nitrosodiphenylamine	ug/L	ND(200)
Pentachlorophenol	ug/L	ND(500)
Phenanthrene	ug/L	ND(200)
Phenol	ug/L	2300
Pyrene	ug/L	ND(200)

TABLE F.9

GROUNDWATER ANALYTICAL RESULTS - WN-2D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2D*
Sample ID:		*GW-121800-WP-707*
Sample Date.		*12/18/2000*
Parameter	*Unit*	
Metals		
Arsenic	ug/L	630
General Chemistry		
Ammonia	mg/L	100
Cyanide (total)	mg/L	0.044
Phenolics (Total)	mg/L	11
Thiocyanate	mg/L	160

GROUNDWATER ANALYTICAL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		*GW-100800-WP-031*	*GW-101100-WP-069*	*GW-101300-WP-097*	*GW-101500-WP-125*	*GW-101800-WP-164*	*GW-102000-WP-189*	*GW-102200-WP-209*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2-Trichloroethane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethene	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloropropane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
2-Butanone	ug/L	100	100	96	97	130	210	ND(50)
2-Hexanone	ug/L	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
4-Methyl-2-pentanone	ug/L	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
Acetone	ug/L	580	470	480	490	830	1100	150
Benzene	ug/L	860	910	860	880	870	1700	500
Bromodichloromethane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromoform	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromomethane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon disulfide	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon tetrachloride	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobenzene	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobromomethane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroethane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroform	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloromethane	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,2-Dichloroethene	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,3-Dichloropropene	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	12	ND(10)
Methylene chloride	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Styrene	ug/L	37	47	40	39	42	83	22
Tetrachloroethene	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Toluene	ug/L	240	280	260	260	280	550	160
trans-1,2-Dichloroethene	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
trans-1,3-Dichloropropene	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Trichloroethene	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Vinyl chloride	ug/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Xylene (total)	ug/L	160	180	130	120	140	270	70
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
1,2-Dichlorobenzene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
1,3-Dichlorobenzene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
1,4-Dichlorobenzene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
2,4,5-Trichlorophenol	ug/L	ND(13000)	ND(13000)	ND(63000)	ND(13000)	ND(13000)	ND(13000)	ND(1300)
2,4,6-Trichlorophenol	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
2,4-Dichlorophenol	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
2,4-Dimethylphenol	ug/L	12000	16000	26000	18000	21000	13000	1100
2,4-Dinitrophenol	ug/L	ND(13000)	ND(13000)	ND(63000)	ND(13000)	ND(13000)	ND(13000)	ND(1300)
2,4-Dinitrotoluene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
2,6-Dinitrotoluene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
2-Chloronaphthalene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
2-Chlorophenol	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)

GROUNDWATER ANALYTICAL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		*GW-100800-WP-031*	*GW-101100-WP-069*	*GW-101300-WP-097*	*GW-101500-WP-125*	*GW-101800-WP-164*	*GW-102000-WP-189*	*GW-102200-WP-209*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
2-Methylphenol	ug/L	25000	42000	85000	62000	59000	32000	2100
2-Nitroaniline	ug/L	ND(13000)	ND(13000)	ND(63000)	ND(13000)	ND(13000)	ND(13000)	ND(1300)
2-Nitrophenol	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
3,3'-Dichlorobenzidine	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
3-Nitroaniline	ug/L	ND(13000)	ND(13000)	ND(63000)	ND(13000)	ND(13000)	ND(13000)	ND(1300)
4,6-Dinitro-2-methylphenol	ug/L	ND(13000)	ND(13000)	ND(63000)	ND(13000)	ND(13000)	ND(13000)	ND(1300)
4-Bromophenyl phenyl ether	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
4-Chloro-3-methylphenol	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
4-Chloroaniline	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
4-Chlorophenyl phenyl ether	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
4-Methylphenol	ug/L	65000	170000	260000	180000	650000	110000	6800
4-Nitroaniline	ug/L	ND(13000)	ND(13000)	ND(63000)	ND(13000)	ND(13000)	ND(13000)	ND(1300)
4-Nitrophenol	ug/L	ND(13000)	ND(13000)	ND(63000)	ND(13000)	ND(13000)	ND(13000)	ND(1300)
Acenaphthene	ug/L	ND(5000) UJ	ND(5000) UJ	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Acenaphthylene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Anthracene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Benzo(a)anthracene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Benzo(a)pyrene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Benzo(b)fluoranthene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Benzo(g,h,i)perylene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Benzo(k)fluoranthene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
bis(2-Chloroethoxy)methane	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
bis(2-Chloroethyl)ether	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
bis(2-Chloroisopropyl)ether	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
bis(2-Ethylhexyl)phthalate	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Butyl benzylphthalate	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Carbazole	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Chrysene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Dibenz(a,h)anthracene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Dibenzofuran	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Diethyl phthalate	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Dimethyl phthalate	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Di-n-butylphthalate	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Di-n-octyl phthalate	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Fluoranthene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Fluorene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Hexachlorobenzene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Hexachlorobutadiene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Hexachlorocyclopentadiene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Hexachloroethane	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Indeno(1,2,3-cd)pyrene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Isophorone	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Naphthalene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Nitrobenzene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
N-Nitrosodi-n-propylamine	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
N-Nitrosodiphenylamine	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Pentachlorophenol	ug/L	ND(13000)	ND(13000)	ND(63000)	ND(13000)	ND(13000)	ND(13000)	ND(1300)
Phenanthrene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)
Phenol	ug/L	250000	270000	380000	280000	970000	180000	6800
Pyrene	ug/L	ND(5000)	ND(5000)	ND(25000)	ND(5000)	ND(5000)	ND(5000)	ND(500)

GROUNDWATER ANALY_ _AL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		*GW-100800-WP-031*	*GW-101100-WP-069*	*GW-101300-WP-097*	*GW-101500-WP-125*	*GW-101800-WP-164*	*GW-102000-WP-189*	*GW-102200-WP-209*
Sample Date:		*10/8/2000*	*10/11/2000*	*10/13/2000*	*10/15/2000*	*10/18/2000*	*10/20/2000*	*10/22/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	18000	20000	15000	29000	40000	21000	11000
General Chemistry								
Ammonia	mg/L	2400	2500	2200	1300	430 J	1000 J	340
Cyanide (total)	mg/L	1.4 J	1 4	1.1	1.1	1.0 J	0.55	0.019
Phenolics (Total)	mg/L	1600	1900	1200	830 J	1000	600	240
Thiocyanate	mg/L	9200	9000	8800	8900	4700	3200	410

GROUNDWATER ANALYTICAL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		*GW-102600-WP-279*	*GW-102800-WP-317*	*GW-103000-WP-360*	*GW-110100-WP-393*	*GW-110300-WP-426*	*GW-110500-WP-459*	*GW-110700-WP-485*
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*	*11/7/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,1,2,2-Tetrachloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,1,2-Trichloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,1-Dichloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,1-Dichloroethene	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,2-Dichloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,2-Dichloropropane	ug/L	-	-	ND(10)	-	-	ND(10)	-
2-Butanone	ug/L	-	-	ND(50)	-	-	ND(50)	-
2-Hexanone	ug/L	-	-	ND(50)	-	-	ND(50)	-
4-Methyl-2-pentanone	ug/L	-	-	ND(50)	-	-	ND(50)	-
Acetone	ug/L	-	-	170	-	-	290	-
Benzene	ug/L	-	-	260	-	-	330	-
Bromodichloromethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
Bromoform	ug/L	-	-	ND(10)	-	-	ND(10)	-
Bromomethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
Carbon disulfide	ug/L	-	-	ND(10)	-	-	ND(10)	-
Carbon tetrachloride	ug/L	-	-	ND(10)	-	-	ND(10)	-
Chlorobenzene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Chlorobromomethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
Chloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
Chloroform	ug/L	-	-	ND(10)	-	-	ND(10)	-
Chloromethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
cis-1,2-Dichloroethene	ug/L	-	-	ND(10)	-	-	ND(10)	-
cis-1,3-Dichloropropene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Methylene chloride	ug/L	-	-	ND(10)	-	-	ND(10)	-
Styrene	ug/L	-	-	10	-	-	14	-
Tetrachloroethene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Toluene	ug/L	-	-	90	-	-	110	-
trans-1,2-Dichloroethene	ug/L	-	-	ND(10)	-	-	ND(10)	-
trans-1,3-Dichloropropene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Trichloroethene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Vinyl chloride	ug/L	-	-	ND(10)	-	-	ND(10)	-
Xylene (total)	ug/L	-	-	36	-	-	48	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
1,2-Dichlorobenzene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
1,3-Dichlorobenzene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
1,4-Dichlorobenzene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
2,4,5-Trichlorophenol	ug/L	-	-	ND(5000)	-	-	ND(5000)	-
2,4,6-Trichlorophenol	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
2,4-Dichlorophenol	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
2,4-Dimethylphenol	ug/L	-	-	4900	-	-	9100	-
2,4-Dinitrophenol	ug/L	-	-	ND(5000)	-	-	ND(5000)	-
2,4-Dinitrotoluene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
2,6-Dinitrotoluene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
2-Chloronaphthalene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
2-Chlorophenol	ug/L	-	-	ND(2000)	-	-	ND(2000)	

GROUNDWATER ANALYTICAL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		*GW-102600-WP-279*	*GW-102800-WP-317*	*GW-103000-WP-360*	*GW-110100-WP-393*	*GW-110300-WP-426*	*GW-110500-WP-459*	*GW-110700-WP-485*
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*	*11/7/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
2-Methylphenol	ug/L	-	-	14000	-	-	30000	-
2-Nitroaniline	ug/L	-	-	ND(5000)	-	-	ND(5000)	-
2-Nitrophenol	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
3,3'-Dichlorobenzidine	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
3-Nitroaniline	ug/L	-	-	ND(5000)	-	-	ND(5000)	-
4,6-Dinitro-2-methylphenol	ug/L	-	-	ND(5000)	-	-	ND(5000)	-
4-Bromophenyl phenyl ether	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
4-Chloro-3-methylphenol	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
4-Chloroaniline	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
4-Chlorophenyl phenyl ether	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
4-Methylphenol	ug/L	-	-	46000	-	-	76000	-
4-Nitroaniline	ug/L	-	-	ND(5000)	-	-	ND(5000)	-
4-Nitrophenol	ug/L	-	-	ND(5000)	-	-	ND(5000)	-
Acenaphthene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Acenaphthylene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Anthracene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Benzo(a)anthracene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Benzo(a)pyrene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Benzo(b)fluoranthene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Benzo(g,h,i)perylene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Benzo(k)fluoranthene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
bis(2-Chloroethoxy)methane	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
bis(2-Chloroethyl)ether	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
bis(2-Chloroisopropyl)ether	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
bis(2-Ethylhexyl)phthalate	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Butyl benzylphthalate	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Carbazole	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Chrysene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Dibenz(a,h)anthracene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Dibenzofuran	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Diethyl phthalate	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Dimethyl phthalate	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Di-n-butylphthalate	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Di-n-octyl phthalate	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Fluoranthene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Fluorene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Hexachlorobenzene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Hexachlorobutadiene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Hexachlorocyclopentadiene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Hexachloroethane	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Indeno(1,2,3-cd)pyrene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Isophorone	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Naphthalene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Nitrobenzene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
N-Nitrosodi-n-propylamine	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
N-Nitrosodiphenylamine	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Pentachlorophenol	ug/L	-	-	ND(5000)	-	-	ND(5000)	-
Phenanthrene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-
Phenol	ug/L	-	-	63000	-	-	110000	-
Pyrene	ug/L	-	-	ND(2000)	-	-	ND(2000)	-

TABLE F.10

GROUNDWATER ANALYTICAL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		*GW-102600-WP-279*	*GW-102800-WP-317*	*GW-103000-WP-360*	*GW-110100-WP-393*	*GW-110300-WP-426*	*GW-110500-WP-459*	*GW-110700-WP-485*
Sample Date:		*10/26/2000*	*10/28/2000*	*10/30/2000*	*11/1/2000*	*11/3/2000*	*11/5/2000*	*11/7/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	11000	9100	7200	9200	8200	4200	6400
General Chemistry								
Ammonia	mg/L	390	370	390	130	400	350	560
Cyanide (total)	mg/L	-	-	0.035	-	-	0.16	-
Phenolics (Total)	mg/L	230	280	230	440	350	370	730
Thiocyanate	mg/L	-	-	580	-	-	710	-

GROUNDWATER ANAL. _AL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		*GW-110900-WP-512*	*GW-111200-WP-552*	*GW-111400-WP-585*	*GW-111600-WP-618*	*GW-111700-WP-631*	*GW-111900-WP-663*	*GW-112700-WP-692*
Sample Date:		*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	-	-	-	-	ND(5.0)
1,1,2,2-Tetrachloroethane	ug/L	-	-	-	-	-	-	ND(5.0)
1,1,2-Trichloroethane	ug/L	-	-	-	-	-	-	ND(5.0)
1,1-Dichloroethane	ug/L	-	-	-	-	-	-	ND(5.0)
1,1-Dichloroethene	ug/L	-	-	-	-	-	-	ND(5.0)
1,2-Dichloroethane	ug/L	-	-	-	-	-	-	ND(5.0)
1,2-Dichloropropane	ug/L	-	-	-	-	-	-	ND(5.0)
2-Butanone	ug/L	-	-	-	-	-	-	46
2-Hexanone	ug/L	-	-	-	-	-	-	ND(25)
4-Methyl-2-pentanone	ug/L	-	-	-	-	-	-	ND(25)
Acetone	ug/L	-	-	-	-	-	-	310
Benzene	ug/L	-	-	-	-	-	-	500
Bromodichloromethane	ug/L	-	-	-	-	-	-	ND(5 0)
Bromoform	ug/L	-	-	-	-	-	-	ND(5.0)
Bromomethane	ug/L	-	-	-	-	-	-	ND(5.0)
Carbon disulfide	ug/L	-	-	-	-	-	-	ND(5.0)
Carbon tetrachloride	ug/L	-	-	-	-	-	-	ND(5.0)
Chlorobenzene	ug/L	-	-	-	-	-	-	ND(5.0)
Chlorobromomethane	ug/L	-	-	-	-	-	-	ND(5.0)
Chloroethane	ug/L	-	-	-	-	-	-	ND(5.0)
Chloroform	ug/L	-	-	-	-	-	-	ND(5.0)
Chloromethane	ug/L	-	-	-	-	-	-	ND(5.0)
cis-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	ND(5.0)
cis-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	ND(5.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	ND(5.0)
Ethylbenzene	ug/L	-	-	-	-	-	-	-
Methylene chloride	ug/L	-	-	-	-	-	-	ND(5.0)
Styrene	ug/L	-	-	-	-	-	-	ND(5.0)
Tetrachloroethene	ug/L	-	-	-	-	-	-	20
Toluene	ug/L	-	-	-	-	-	-	ND(5.0)
trans-1,2-Dichloroethene	ug/L	-	-	-	-	-	-	150
trans-1,3-Dichloropropene	ug/L	-	-	-	-	-	-	ND(5.0)
Trichloroethene	ug/L	-	-	-	-	-	-	ND(5.0)
Vinyl chloride	ug/L	-	-	-	-	-	-	ND(5.0)
Xylene (total)	ug/L	-	-	-	-	-	-	ND(5.0)
Semi - Volatiles								62
1,2,4-Trichlorobenzene	ug/L	-	-	-	-	-	-	ND(40000)
1,2-Dichlorobenzene	ug/L	-	-	-	-	-	-	ND(40000)
1,3-Dichlorobenzene	ug/L	-	-	-	-	-	-	ND(40000)
1,4-Dichlorobenzene	ug/L	-	-	-	-	-	-	ND(40000)
2,4,5-Trichlorophenol	ug/L	-	-	-	-	-	-	ND(100000)
2,4,6-Trichlorophenol	ug/L	-	-	-	-	-	-	ND(40000)
2,4-Dichlorophenol	ug/L	-	-	-	-	-	-	ND(40000)
2,4-Dimethylphenol	ug/L	-	-	-	-	-	-	ND(40000)
2,4-Dinitrophenol	ug/L	-	-	-	-	-	-	ND(100000)
2,4-Dinitrotoluene	ug/L	-	-	-	-	-	-	ND(40000)
2,6-Dinitrotoluene	ug/L	-	-	-	-	-	-	ND(40000)
2-Chloronaphthalene	ug/L	-	-	-	-	-	-	ND(40000)
2-Chlorophenol	ug/L	-	-	-	-	-	-	ND(40000)

TABLE F.10

GROUNDWATER ANALYTICAL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		WN-2E	WN-2E	WN-2E	WN-2E	WN-2E	WN-2E	WN-2E
Sample ID:		GW-110900-WP-512	GW-111200-WP-552	GW-111400-WP-585	GW-111600-WP-618	GW-111700-WP-631	GW-111900-WP-663	GW-112700-WP-692
Sample Date:		11/9/2000	11/12/2000	11/14/2000	11/16/2000	11/17/2000	11/19/2000	11/27/2000
Parameter	Unit							
2-Methyl naphthalene	ug/L	-	-	-	-	-	-	ND(40000)
2-Methylphenol	ug/L	-	-	-	-	-	-	46000
2-Nitroaniline	ug/L	-	-	-	-	-	-	ND(100000)
2-Nitrophenol	ug/L	-	-	-	-	-	-	ND(40000)
3,3'-Dichlorobenzidine	ug/L	-	-	-	-	-	-	ND(40000)
3-Nitroaniline	ug/L	-	-	-	-	-	-	ND(100000)
4,6-Dinitro-2-methylphenol	ug/L	-	-	-	-	-	-	ND(100000)
4-Bromophenyl phenyl ether	ug/L	-	-	-	-	-	-	ND(40000)
4-Chloro-3-methylphenol	ug/L	-	-	-	-	-	-	ND(40000)
4-Chloroaniline	ug/L	-	-	-	-	-	-	ND(40000)
4-Chlorophenyl phenyl ether	ug/L	-	-	-	-	-	-	ND(40000)
4-Methylphenol	ug/L	-	-	-	-	-	-	140000
4-Nitroaniline	ug/L	-	-	-	-	-	-	ND(100000)
4-Nitrophenol	ug/L	-	-	-	-	-	-	ND(100000)
Acenaphthene	ug/L	-	-	-	-	-	-	ND(40000)
Acenaphthylene	ug/L	-	-	-	-	-	-	ND(40000)
Anthracene	ug/L	-	-	-	-	-	-	ND(40000)
Benzo(a)anthracene	ug/L	-	-	-	-	-	-	ND(40000)
Benzo(a)pyrene	ug/L	-	-	-	-	-	-	ND(40000)
Benzo(b)fluoranthene	ug/L	-	-	-	-	-	-	ND(40000)
Benzo(g,h,i)perylene	ug/L	-	-	-	-	-	-	ND(40000)
Benzo(k)fluoranthene	ug/L	-	-	-	-	-	-	ND(40000)
bis(2-Chloroethoxy)methane	ug/L	-	-	-	-	-	-	ND(40000)
bis(2-Chloroethyl)ether	ug/L	-	-	-	-	-	-	ND(40000)
bis(2-Chloroisopropyl)ether	ug/L	-	-	-	-	-	-	ND(40000)
bis(2-Ethylhexyl)phthalate	ug/L	-	-	-	-	-	-	ND(40000)
Butyl benzylphthalate	ug/L	-	-	-	-	-	-	ND(40000)
Carbazole	ug/L	-	-	-	-	-	-	ND(40000)
Chrysene	ug/L	-	-	-	-	-	-	ND(40000)
Dibenz(a,h)anthracene	ug/L	-	-	-	-	-	-	ND(40000)
Dibenzofuran	ug/L	-	-	-	-	-	-	ND(40000)
Diethyl phthalate	ug/L	-	-	-	-	-	-	ND(40000)
Dimethyl phthalate	ug/L	-	-	-	-	-	-	ND(40000)
Di-n-butylphthalate	ug/L	-	-	-	-	-	-	ND(40000)
Di-n-octyl phthalate	ug/L	-	-	-	-	-	-	ND(40000)
Fluoranthene	ug/L	-	-	-	-	-	-	ND(40000)
Fluorene	ug/L	-	-	-	-	-	-	ND(40000)
Hexachlorobenzene	ug/L	-	-	-	-	-	-	ND(40000)
Hexachlorobutadiene	ug/L	-	-	-	-	-	-	ND(40000)
Hexachlorocyclopentadiene	ug/L	-	-	-	-	-	-	ND(40000)
Hexachloroethane	ug/L	-	-	-	-	-	-	ND(40000)
Indeno(1,2,3-cd)pyrene	ug/L	-	-	-	-	-	-	ND(40000)
Isophorone	ug/L	-	-	-	-	-	-	ND(40000)
Naphthalene	ug/L	-	-	-	-	-	-	ND(40000)
Nitrobenzene	ug/L	-	-	-	-	-	-	ND(40000)
N-Nitrosodi-n-propylamine	ug/L	-	-	-	-	-	-	ND(40000)
N-Nitrosodiphenylamine	ug/L	-	-	-	-	-	-	ND(40000)
Pentachlorophenol	ug/L	-	-	-	-	-	-	ND(100000)
Phenanthrene	ug/L	-	-	-	-	-	-	ND(40000)
Phenol	ug/L	-	-	-	-	-	-	210000
Pyrene	ug/L	-	-	-	-	-	-	ND(40000)

GROUNDWATER ANALYTICAL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		GW-110900-WP-512	GW-111200-WP-552	GW-111400-WP-585	GW-111600-WP-618	GW-111700-WP-631	GW-111900-WP-663	GW-112700-WP-692
Sample Date:		*11/9/2000*	*11/12/2000*	*11/14/2000*	*11/16/2000*	*11/17/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	6300	12000	13000	17000	16000	15000	10000
General Chemistry								
Ammonia	mg/L	790	1000	120	68	480	1700	970
Cyanide (total)	mg/L	-	-	-	-	-	-	0.31 J
Phenolics (Total)	mg/L	630	800	580	740	940	1000	590
Thiocyanate	mg/L	-	-	-	-	-	-	4600

TABLE F.10

GROUNDWATER ANALYTICAL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		*GW-112700-WP-693*	*GW-121800-WP-708*	*GW-121800-WP-714*
Sample Date:		*11/27/2000*	*12/18/2000*	*12/18/2000*
		Dupl.		*Dupl.*
Parameter	*Unit*			
Volatiles				
1,1,1-Trichloroethane	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
1,1,2-Trichloroethane	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
1,1-Dichloroethane	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
1,1-Dichloroethene	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
1,2-Dichloroethane	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
1,2-Dichloropropane	ug/L	ND(5.0)	ND(5 0)	ND(5.0)
2-Butanone	ug/L	40	83	99
2-Hexanone	ug/L	ND(25)	ND(25)	ND(25)
4-Methyl-2-pentanone	ug/L	ND(25)	ND(25)	ND(25)
Acetone	ug/L	200	590	610
Benzene	ug/L	480	710	700
Bromodichloromethane	ug/L	ND(5.0)	ND(5 0)	ND(5.0)
Bromoform	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Bromomethane	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Carbon disulfide	ug/L	5.8	ND(5.0)	ND(5.0)
Carbon tetrachloride	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Chlorobenzene	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Chlorobromomethane	ug/L	ND(5.0)	-	-
Chloroethane	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Chloroform	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Chloromethane	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
cis-1,2-Dichloroethene	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
cis-1,3-Dichloropropene	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Dibromochloromethane	ug/L	-	ND(5.0)	ND(5.0)
Ethylbenzene	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Methylene chloride	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Styrene	ug/L	20	21	23
Tetrachloroethene	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Toluene	ug/L	150	230	250
trans-1,2-Dichloroethene	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
trans-1,3-Dichloropropene	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Trichloroethene	ug/L	ND(5.0)	ND(5.0)	ND(5.0)
Vinyl chloride	ug/L	ND(5.0)	ND(10)	ND(10)
Xylene (total)	ug/L	61	67	76
Semi - Volatiles				
1,2,4-Trichlorobenzene	ug/L	ND(40000)	ND(1000)	ND(1000)
1,2-Dichlorobenzene	ug/L	ND(40000)	ND(1000)	ND(1000)
1,3-Dichlorobenzene	ug/L	ND(40000)	ND(1000)	ND(1000)
1,4-Dichlorobenzene	ug/L	ND(40000)	ND(1000)	ND(1000)
2,4,5-Trichlorophenol	ug/L	ND(100000)	ND(2500)	ND(2500)
2,4,6-Trichlorophenol	ug/L	ND(40000)	ND(1000)	ND(1000)
2,4-Dichlorophenol	ug/L	ND(40000)	ND(1000)	ND(1000)
2,4-Dimethylphenol	ug/L	ND(40000)	15000	17000
2,4-Dinitrophenol	ug/L	ND(100000)	ND(2500)	ND(2500)
2,4-Dinitrotoluene	ug/L	ND(40000)	ND(1000)	ND(1000)
2,6-Dinitrotoluene	ug/L	ND(40000)	ND(1000)	ND(1000)
2-Chloronaphthalene	ug/L	ND(40000)	ND(1000)	ND(1000)
2-Chlorophenol	ug/L	ND(40000)	ND(1000)	ND(1000)

GROUNDWATER ANALYTICAL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		*GW-112700-WP-693*	*GW-121800-WP-708*	*GW-121800-WP-714*
Sample Date:		*11/27/2000*	*12/18/2000*	*12/18/2000*
		Dupl.		*Dupl.*
Parameter	*Unit*			
2-Methyl naphthalene	ug/L	ND(40000)	ND(1000)	ND(1000)
2-Methylphenol	ug/L	ND(40000)	30000	46000
2-Nitroaniline	ug/L	ND(100000)	ND(2500)	ND(2500)
2-Nitrophenol	ug/L	ND(40000)	ND(1000)	ND(1000)
3,3'-Dichlorobenzidine	ug/L	ND(40000)	ND(1000)	ND(1000)
3-Nitroaniline	ug/L	ND(100000)	ND(2500)	ND(2500)
4,6-Dinitro-2-methylphenol	ug/L	ND(100000)	ND(2500)	ND(2500)
4-Bromophenyl phenyl ether	ug/L	ND(40000)	ND(1000)	ND(1000)
4-Chloro-3-methylphenol	ug/L	ND(40000)	ND(1000)	ND(1000)
4-Chloroaniline	ug/L	ND(40000)	ND(1000)	ND(1000)
4-Chlorophenyl phenyl ether	ug/L	ND(40000)	ND(1000)	ND(1000)
4-Methylphenol	ug/L	140000	110000	140000
4-Nitroaniline	ug/L	ND(100000)	ND(2500)	ND(2500)
4-Nitrophenol	ug/L	ND(100000)	ND(2500)	ND(2500)
Acenaphthene	ug/L	ND(40000)	ND(1000)	ND(1000)
Acenaphthylene	ug/L	ND(40000)	ND(1000)	ND(1000)
Anthracene	ug/L	ND(40000)	ND(1000)	ND(1000)
Benzo(a)anthracene	ug/L	ND(40000)	ND(1000)	ND(1000)
Benzo(a)pyrene	ug/L	ND(40000)	ND(1000)	ND(1000)
Benzo(b)fluoranthene	ug/L	ND(40000)	ND(1000)	ND(1000)
Benzo(g,h,i)perylene	ug/L	ND(40000)	ND(1000)	ND(1000)
Benzo(k)fluoranthene	ug/L	ND(40000)	ND(1000)	ND(1000)
bis(2-Chloroethoxy)methane	ug/L	ND(40000)	ND(1000)	ND(1000)
bis(2-Chloroethyl)ether	ug/L	ND(40000)	ND(1000)	ND(1000)
bis(2-Chloroisopropyl)ether	ug/L	ND(40000)	ND(1000)	ND(1000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(40000)	ND(1000)	ND(1000)
Butyl benzylphthalate	ug/L	ND(40000)	ND(1000)	ND(1000)
Carbazole	ug/L	ND(40000)	ND(1000)	ND(1000)
Chrysene	ug/L	ND(40000)	ND(1000)	ND(1000)
Dibenz(a,h)anthracene	ug/L	ND(40000)	ND(1000)	ND(1000)
Dibenzofuran	ug/L	ND(40000)	ND(1000)	ND(1000)
Diethyl phthalate	ug/L	ND(40000)	ND(1000)	ND(1000)
Dimethyl phthalate	ug/L	ND(40000)	ND(1000)	ND(1000)
Di-n-butylphthalate	ug/L	ND(40000)	ND(1000)	ND(1000)
Di-n-octyl phthalate	ug/L	ND(40000)	ND(1000)	ND(1000)
Fluoranthene	ug/L	ND(40000)	ND(1000)	ND(1000)
Fluorene	ug/L	ND(40000)	ND(1000)	ND(1000)
Hexachlorobenzene	ug/L	ND(40000)	ND(1000)	ND(1000)
Hexachlorobutadiene	ug/L	ND(40000)	ND(1000)	ND(1000)
Hexachlorocyclopentadiene	ug/L	ND(40000)	ND(1000)	ND(1000)
Hexachloroethane	ug/L	ND(40000)	ND(1000)	ND(1000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(40000)	ND(1000)	ND(1000)
Isophorone	ug/L	ND(40000)	ND(1000)	ND(1000)
Naphthalene	ug/L	ND(40000)	ND(1000)	ND(1000)
Nitrobenzene	ug/L	ND(40000)	ND(1000)	ND(1000)
N-Nitrosodi-n-propylamine	ug/L	ND(40000)	ND(1000)	ND(1000)
N-Nitrosodiphenylamine	ug/L	ND(40000)	ND(1000)	ND(1000)
Pentachlorophenol	ug/L	ND(100000)	ND(2500)	ND(2500)
Phenanthrene	ug/L	ND(40000)	ND(1000)	ND(1000)
Phenol	ug/L	200000	150000	220000
Pyrene	ug/L	ND(40000)	ND(1000)	ND(1000)

TABLE F.10

GROUNDWATER ANALYTICAL RESULTS - WN-2E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-2E*	*WN-2E*	*WN-2E*
Sample ID:		*GW-112700-WP-693*	*GW-121800-WP-708*	*GW-121800-WP-714*
Sample Date:		*11/27/2000*	*12/18/2000*	*12/18/2000*
		Dupl.		*Dupl.*
Parameter	*Unit*			
Metals				
Arsenic	ug/L	9800	11000	13000
General Chemistry				
Ammonia	mg/L	1000	1600	1600
Cyanide (total)	mg/L	0.52 J	0.68	0.84
Phenolics (Total)	mg/L	600	870	1000
Thiocyanate	mg/L	2900	9000	5300

GROUNDWATER ANALYTICAL RESULTS - EW-1
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-1*	*EW-1*	*EW-1*	*EW-1*	*EW-1*	*EW-1*	*EW-1*
Sample ID:		*GW-100900-WP-042*	*GW-101100-WP-070*	*GW-101400-WP-108*	*GW-101700-WP-153*	*GW-101900-WP-171*	*GW-102000-WP-195*	*GW-102100-WP-201*
Sample Date:		*10/9/2000*	*10/11/2000*	*10/14/2000*	*10/17/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
1,1,2,2-Tetrachloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
1,1,2-Trichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
1,1-Dichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
1,1-Dichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
1,2-Dichloroethane	ug/L	ND(5.0)	ND(1 0)	ND(10)	ND(10)	ND(10)	-	ND(10)
1,2-Dichloropropane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
2-Butanone	ug/L	79	65	55	70	ND(50)	-	ND(50)
2-Hexanone	ug/L	ND(25)	ND(5.0)	ND(50)	ND(50)	ND(50)	-	ND(50)
4-Methyl-2-pentanone	ug/L	ND(25)	ND(5.0)	ND(50)	ND(50)	ND(50)	-	ND(50)
Acetone	ug/L	370	340	290	320	100	-	ND(50)
Benzene	ug/L	900	730	700	710	370	-	250
Bromodichloromethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Bromoform	ug/L	ND(5 0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Bromomethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Carbon disulfide	ug/L	6.8	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Carbon tetrachloride	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Chlorobenzene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Chlorobromomethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Chloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Chloroform	ug/L	ND(5 0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Chloromethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
cis-1,2-Dichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
cis-1,3-Dichloropropene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Ethylbenzene	ug/L	8.2	7.6	ND(10)	ND(10)	ND(10)	-	ND(10)
Methylene chloride	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Styrene	ug/L	42	42	37	35	17	-	11
Tetrachloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Toluene	ug/L	310	260	240	280	150	-	100
trans-1,2-Dichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
trans-1,3-Dichloropropene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Trichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Vinyl chloride	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	-	ND(10)
Xylene (total)	ug/L	180	160	140	170	83	-	54
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
1,2-Dichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
1,3-Dichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
1,4-Dichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
2,4,5-Trichlorophenol	ug/L	ND(26000)	ND(13000)	ND(63000)	ND(25000)	ND(13000)	-	ND(5000)
2,4,6-Trichlorophenol	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
2,4-Dichlorophenol	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
2,4-Dimethylphenol	ug/L	25000	18000	ND(25000)	ND(10000)	ND(5000)	-	2300
2,4-Dinitrophenol	ug/L	ND(26000)	ND(13000)	ND(63000)	ND(25000)	ND(13000)	-	ND(5000)
2,4-Dinitrotoluene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
2,6-Dinitrotoluene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
2-Chloronaphthalene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
2-Chlorophenol	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
2-Methyl naphthalene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)

GROUNDWATER ANALYTICAL RESULTS - EW-1
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		EW-1	EW-1	EW-1	EW-1	EW-1	EW-1	EW-1
Sample ID:		GW-100900-WP-042	GW-101100-WP-070	GW-101400-WP-108	GW-101700-WP-153	GW-101900-WP-171	GW-102000-WP-195	GW-102100-WP-201
Sample Date:		10/9/2000	10/11/2000	10/14/2000	10/17/2000	10/19/2000	10/20/2000	10/21/2000
Parameter	*Unit*							
2-Methylphenol	ug/L	73000	44000	56000	19000	9600	-	5200
2-Nitroaniline	ug/L	ND(26000)	ND(13000)	ND(63000)	ND(25000)	ND(13000)	-	ND(5000)
2-Nitrophenol	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
3,3'-Dichlorobenzidine	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
3-Nitroaniline	ug/L	ND(26000)	ND(13000)	ND(63000)	ND(25000)	ND(13000)	-	ND(5000)
4,6-Dinitro-2-methylphenol	ug/L	ND(26000)	ND(13000)	ND(63000)	ND(25000)	ND(13000)	-	ND(5000)
4-Bromophenyl phenyl ether	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
4-Chloro-3-methylphenol	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
4-Chloroaniline	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
4-Chlorophenyl phenyl ether	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
4-Methylphenol	ug/L	260000	180000	180000	64000	31000	-	16000
4-Nitroaniline	ug/L	ND(26000)	ND(13000)	ND(63000)	ND(25000)	ND(13000)	-	ND(5000)
4-Nitrophenol	ug/L	ND(26000)	ND(13000)	ND(63000)	ND(25000)	ND(13000)	-	ND(5000)
Acenaphthene	ug/L	ND(10000)	ND(5000) UJ	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Acenaphthylene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Anthracene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Benzo(a)anthracene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Benzo(a)pyrene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Benzo(b)fluoranthene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Benzo(g,h,i)perylene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Benzo(k)fluoranthene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
bis(2-Chloroethoxy)methane	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
bis(2-Chloroethyl)ether	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
bis(2-Chloroisopropyl)ether	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Butyl benzylphthalate	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Carbazole	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Chrysene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Dibenz(a,h)anthracene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Dibenzofuran	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Diethyl phthalate	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Dimethyl phthalate	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Di-n-butylphthalate	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Di-n-octyl phthalate	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Fluoranthene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Fluorene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Hexachlorobenzene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Hexachlorobutadiene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Hexachlorocyclopentadiene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Hexachloroethane	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Isophorone	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Naphthalene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Nitrobenzene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
N-Nitrosodi-n-propylamine	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
N-Nitrosodiphenylamine	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Pentachlorophenol	ug/L	ND(26000)	ND(13000)	ND(63000)	ND(25000)	ND(13000)	-	ND(5000)
Phenanthrene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Phenol	ug/L	360000	240000	250000	84000	34000	-	14000
Pyrene	ug/L	ND(10000)	ND(5000)	ND(25000)	ND(10000)	ND(5000)	-	ND(2000)
Metals								

GROUNDWATER ANALYTICAL RESULTS - EW-1
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		EW-1	EW-1	EW-1	EW-1	EW-1	EW-1	EW-1
Sample ID:		*GW-100900-WP-042*	*GW-101100-WP-070*	*GW-101400-WP-108*	*GW-101700-WP-153*	*GW-101900-WP-171*	*GW-102000-WP-195*	*GW-102100-WP-201*
Sample Date:		*10/9/2000*	*10/11/2000*	*10/14/2000*	*10/17/2000*	*10/19/2000*	*10/20/2000*	*10/21/2000*
Parameter	*Unit*							
Arsenic	ug/L	9000	9300	14000	8000	5300	3600	3000
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	3300	3200	2800	1100	1000	-	550
Ammonia	mg/L	1800	2000	1600	850	350	270	-
Chemical Oxygen Demand (COD)	mg/L	7600	5900	6300	2300	890	-	400
Cyanide (total)	mg/L	0.050	0.75	0.74	0.069	0.21	-	0.016 J
Nitrate (as N)	mg/L	0.25	0.24	ND(0.20)	0.28	0.29	-	0.30
Phenolics (Total)	mg/L	2000	1100	1100	350	160	120	64
Thiocyanate	mg/L	8300	4800	6100	960	1500	-	100
Total Suspended Solids (TSS)	mg/L	190	45	ND(10)	ND(10)	ND(10)	-	ND(10)

TABLE F.11

GROUNDWATER ANALYTICAL RESULTS - EW-1
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*EW-1*	*EW-1*	*EW-1*	*EW-1*	*EW-1*
Sample ID:		*GW-102200-WP-220*	*GW-102800-WP-318*	*GW-110300-WP-427*	*GW-111000-WP-526*	*GW-111700-WP-632*
Sample Date:		*10/22/2000*	*10/28/2000*	*11/3/2000*	*11/10/2000*	*11/17/2000*
Parameter	*Unit*					
Volatiles						
1,1,1-Trichloroethane	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
1,1-Dichloroethane	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	-	ND(10)	ND(10)	ND(1 0)	ND(1.0)
1,2-Dichloropropane	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
2-Butanone	ug/L	-	ND(50)	ND(50)	ND(5.0)	ND(5.0)
2-Hexanone	ug/L	-	ND(50)	ND(50)	ND(5.0)	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	ND(50)	ND(50)	ND(5.0)	ND(5.0)
Acetone	ug/L	-	ND(50)	ND(50)	5.1	6.9
Benzene	ug/L	-	110	89	80	61
Bromodichloromethane	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Bromoform	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Bromomethane	ug/L	-	ND(10)	ND(10)	ND(2.0)	ND(1.0)
Carbon disulfide	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Carbon tetrachloride	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Chlorobenzene	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Chlorobromomethane	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Chloroethane	ug/L	-	ND(10)	ND(10)	ND(2.0)	ND(1.0)
Chloroform	ug/L	-	ND(10)	ND(10)	1.4	1.9
Chloromethane	ug/L	-	ND(10)	ND(10)	ND(2.0)	ND(1.0)
cis-1,2-Dichloroethene	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Ethylbenzene	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Methylene chloride	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Styrene	ug/L	-	ND(10)	ND(10)	4.8	4.4
Tetrachloroethene	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Toluene	ug/L	-	48	43	42	39
trans-1,2-Dichloroethene	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Trichloroethene	ug/L	-	ND(10)	ND(10)	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	-	ND(10)	ND(10)	ND(2.0)	ND(1.0)
Xylene (total)	ug/L	-	25	23	23	21
Semi - Volatiles						
1,2,4-Trichlorobenzene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
1,2-Dichlorobenzene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
1,3-Dichlorobenzene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
1,4-Dichlorobenzene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
2,4,5-Trichlorophenol	ug/L	-	ND(2500)	ND(1300)	ND(1300)	ND(1300)
2,4,6-Trichlorophenol	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
2,4-Dichlorophenol	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
2,4-Dimethylphenol	ug/L	-	1200	990	810	610
2,4-Dinitrophenol	ug/L	-	ND(2500)	ND(1300)	ND(1300)	ND(1300)
2,4-Dinitrotoluene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
2,6-Dinitrotoluene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
2-Chloronaphthalene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
2-Chlorophenol	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
2-Methyl naphthalene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)

GROUNDWATER ANAL .CAL RESULTS - EW-1
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		EW-1	EW-1	EW-1	EW-1	EW-1
Sample ID:		*GW-102200-WP-220*	*GW-102800-WP-318*	*GW-110300-WP-427*	*GW-111000-WP-526*	*GW-111700-WP-632*
Sample Date:		*10/22/2000*	*10/28/2000*	*11/3/2000*	*11/10/2000*	*11/17/2000*
Parameter	*Unit*					
2-Methylphenol	ug/L	-	1900	1200	880	950
2-Nitroaniline	ug/L	-	ND(2500)	ND(1300)	ND(1300)	ND(1300)
2-Nitrophenol	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
3,3'-Dichlorobenzidine	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
3-Nitroaniline	ug/L	-	ND(2500)	ND(1300)	ND(1300)	ND(1300)
4,6-Dinitro-2-methylphenol	ug/L	-	ND(2500)	ND(1300)	ND(1300)	ND(1300)
4-Bromophenyl phenyl ether	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
4-Chloro-3-methylphenol	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
4-Chloroaniline	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
4-Chlorophenyl phenyl ether	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
4-Methylphenol	ug/L	-	5700	3600	2600	2600
4-Nitroaniline	ug/L	-	ND(2500)	ND(1300)	ND(1300)	ND(1300)
4-Nitrophenol	ug/L	-	ND(2500)	ND(1300)	ND(1300)	ND(1300)
Acenaphthene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Acenaphthylene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Anthracene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Benzo(a)anthracene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Benzo(a)pyrene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Benzo(b)fluoranthene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Benzo(g,h,i)perylene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Benzo(k)fluoranthene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
bis(2-Chloroethoxy)methane	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
bis(2-Chloroethyl)ether	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
bis(2-Chloroisopropyl)ether	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
bis(2-Ethylhexyl)phthalate	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Butyl benzylphthalate	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Carbazole	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Chrysene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Dibenz(a,h)anthracene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Dibenzofuran	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Diethyl phthalate	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Dimethyl phthalate	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Di-n-butylphthalate	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Di-n-octyl phthalate	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Fluoranthene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Fluorene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Hexachlorobenzene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Hexachlorobutadiene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Hexachlorocyclopentadiene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Hexachloroethane	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Indeno(1,2,3-cd)pyrene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Isophorone	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Naphthalene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Nitrobenzene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
N-Nitrosodi-n-propylamine	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
N-Nitrosodiphenylamine	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Pentachlorophenol	ug/L	-	ND(2500)	ND(1300)	ND(1300)	ND(1300)
Phenanthrene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Phenol	ug/L	-	3600	2500	1900	2800
Pyrene	ug/L	-	ND(1000)	ND(500)	ND(500)	ND(500)
Metals						

GROUNDWATER ANALYTICAL RESULTS - EW-1
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-1*	*EW-1*	*EW-1*	*EW-1*	*EW-1*
Sample ID:		*GW-102200-WP-220*	*GW-102800-WP-318*	*GW-110300-WP-427*	*GW-111000-WP-526*	*GW-111700-WP-632*
Sample Date:		*10/22/2000*	*10/28/2000*	*11/3/2000*	*11/10/2000*	*11/17/2000*
Parameter	*Unit*					
Arsenic	ug/L	2500	1400	1100	890	730
General Chemistry						
Alkalinity, Total (As CaCO3)	mg/L	-	280	260	350	270
Ammonia	mg/L	160	79	84	71	65
Chemical Oxygen Demand (COD)	mg/L	-	100	260	450	98
Cyanide (total)	mg/L	-	ND(0.010)	ND(0.010)	0.012	ND(0.010)
Nitrate (as N)	mg/L	-	0.40	1.5	ND(0.20)	ND(0.20)
Phenolics (Total)	mg/L	36	26	12	12	11
Thiocyanate	mg/L	-	82	93	97	1100
Total Suspended Solids (TSS)	mg/L	-	ND(10)	ND(10)	ND(10)	ND(10)

GROUNDWATER ANALYTICAL RESULTS - EW-2
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-2*	*EW-2*	*EW-2*	*EW-2*	*EW-2*	*EW-2*	*EW-2*
Sample ID:		*GW-100900-WP-043*	*GW-101100-WP-071*	*GW-101400-WP-109*	*GW-101700-WP-154*	*GW-101900-WP-172*	*GW-102100-WP-202*	*GW-102800-WP-319*
Sample Date:		*10/9/2000*	*10/11/2000*	*10/14/2000*	*10/17/2000*	*10/19/2000*	*10/21/2000*	*10/28/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2-Trichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloropropane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
2-Butanone	ug/L	54	47	ND(50)	110	97	67	ND(50)
2-Hexanone	ug/L	ND(25)	ND(5.0)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
4-Methyl-2-pentanone	ug/L	ND(25)	ND(5.0)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
Acetone	ug/L	240	240	220	690	550	400	130
Benzene	ug/L	690	480	550	1100	930	690	270
Bromodichloromethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromoform	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromomethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon disulfide	ug/L	8 1	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon tetrachloride	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobenzene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobromomethane	ug/L	ND(5.0)	ND(1 0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroform	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloromethane	ug/L	22	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,2-Dichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,3-Dichloropropene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Ethylbenzene	ug/L	7.0	6.7	ND(10)	12	ND(10)	ND(10)	ND(10)
Methylene chloride	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Styrene	ug/L	31	32	28	60	48	35	13
Tetrachloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Toluene	ug/L	ND(5.0)	140	190	430	360	260	100
trans-1,2-Dichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
trans-1,3-Dichloropropene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Trichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Vinyl chloride	ug/L	ND(5 0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Xylene (total)	ug/L	160	150	120	290	230	170	64
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
1,2-Dichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
1,3-Dichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
1,4-Dichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
2,4,5-Trichlorophenol	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)
2,4,6-Trichlorophenol	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
2,4-Dichlorophenol	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
2,4-Dimethylphenol	ug/L	22000	15000	16000	ND(15000)	9000	ND(10000)	5600
2,4-Dinitrophenol	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)
2,4-Dinitrotoluene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
2,6-Dinitrotoluene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
2-Chloronaphthalene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
2-Chlorophenol	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
2-Methyl naphthalene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)

GROUNDWATER ANALYTICAL RESULTS - EW-2
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-2*	*EW-2*	*EW-2*	*EW-2*	*EW-2*	*EW-2*	*EW-2*
Sample ID:		*GW-100900-WP-043*	*GW-101100-WP-071*	*GW-101400-WP-109*	*GW-101700-WP-154*	*GW-101900-WP-172*	*GW-102100-WP-202*	*GW-102800-WP-319*
Sample Date:		*10/9/2000*	*10/11/2000*	*10/14/2000*	*10/17/2000*	*10/19/2000*	*10/21/2000*	*10/28/2000*
Parameter	*Unit*							
2-Methylphenol	ug/L	61000	37000	42000	36000	24000	25000	15000
2-Nitroaniline	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)
2-Nitrophenol	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
3,3'-Dichlorobenzidine	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
3-Nitroaniline	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)
4,6-Dinitro-2-methylphenol	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)
4-Bromophenyl phenyl ether	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
4-Chloro-3-methylphenol	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
4-Chloroaniline	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
4-Chlorophenyl phenyl ether	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
4-Methylphenol	ug/L	160000	140000	130000	120000	80000	78000	46000
4-Nitroaniline	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)
4-Nitrophenol	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)
Acenaphthene	ug/L	ND(10000)	ND(5000) UJ	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Acenaphthylene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Anthracene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Benzo(a)anthracene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Benzo(a)pyrene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Benzo(b)fluoranthene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Benzo(g,h,i)perylene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Benzo(k)fluoranthene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
bis(2-Chloroethoxy)methane	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
bis(2-Chloroethyl)ether	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
bis(2-Chloroisopropyl)ether	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Butyl benzylphthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Carbazole	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Chrysene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Dibenz(a,h)anthracene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Dibenzofuran	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Diethyl phthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Dimethyl phthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Di-n-butylphthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Di-n-octyl phthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Fluoranthene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Fluorene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Hexachlorobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Hexachlorobutadiene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Hexachlorocyclopentadiene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Hexachloroethane	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Isophorone	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Naphthalene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Nitrobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
N-Nitrosodi-n-propylamine	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
N-Nitrosodiphenylamine	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Pentachlorophenol	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)
Phenanthrene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Phenol	ug/L	280000	190000	170000	170000	130000	100000	66000
Pyrene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)
Metals								

GROUNDWATER ANALYTICAL RESULTS - EW-2
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-2*	*EW-2*	*EW-2*	*EW-2*	*EW-2*	*EW-2*	*EW-2*
Sample ID:		*GW-100900-WP-043*	*GW-101100-WP-071*	*GW-101400-WP-109*	*GW-101700-WP-154*	*GW-101900-WP-172*	*GW-102100-WP-202*	*GW-102800-WP-319*
Sample Date:		*10/9/2000*	*10/11/2000*	*10/14/2000*	*10/17/2000*	*10/19/2000*	*10/21/2000*	*10/28/2000*
Parameter	*Unit*							
Arsenic	ug/L	12000	11000	11000	10000	8700	7500	6000
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	2500	2100	2000	1400	1500	1300	830
Ammonia	mg/L	1600	1600	1200	1100	680	740	490
Chemical Oxygen Demand (COD)	mg/L	5500	4900	4900	2900	2700	1900	1700
Cyanide (total)	mg/L	0.074	0.42	0.36	0.088	0.48	0.034 J	0.013
Nitrate (as N)	mg/L	ND(0.20)	0.22	0.29	0.22	0.21	0.24	3.8
Phenolics (Total)	mg/L	930	830	740	630	470	340	310
Thiocyanate	mg/L	4700	5800	7700	3900	4000	800	400
Total Suspended Solids (TSS)	mg/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)

GROUNDWATER ANALYTICAL RESULTS - EW-2
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-2*	*EW-2*	*EW-2*
Sample ID:		*GW-110300-WP-428*	*GW-111000-WP-527*	*GW-111700-WP-633*
Sample Date:		*11/3/2000*	*11/10/2000*	*11/17/2000*
Parameter	*Unit*			
Volatiles				
1,1,1-Trichloroethane	ug/L	ND(10)	ND(10)	ND(2.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	ND(10)	ND(2.0)
1,1,2-Trichloroethane	ug/L	ND(10)	ND(10)	ND(2.0)
1,1-Dichloroethane	ug/L	ND(10)	ND(10)	ND(2.0)
1,1-Dichloroethene	ug/L	ND(10)	ND(10)	ND(2.0)
1,2-Dichloroethane	ug/L	ND(10)	ND(10)	ND(2.0)
1,2-Dichloropropane	ug/L	ND(10)	ND(10)	ND(2.0)
2-Butanone	ug/L	ND(50)	ND(50)	16
2-Hexanone	ug/L	ND(50)	ND(50)	ND(10)
4-Methyl-2-pentanone	ug/L	ND(50)	ND(50)	ND(10)
Acetone	ug/L	150	99	97
Benzene	ug/L	250	210	220
Bromodichloromethane	ug/L	ND(10)	ND(10)	ND(2.0)
Bromoform	ug/L	ND(10)	ND(10)	ND(2.0)
Bromomethane	ug/L	ND(10)	ND(20)	ND(2.0)
Carbon disulfide	ug/L	ND(10)	ND(10)	ND(2.0)
Carbon tetrachloride	ug/L	ND(10)	ND(10)	ND(2.0)
Chlorobenzene	ug/L	ND(10)	ND(10)	ND(2.0)
Chlorobromomethane	ug/L	ND(10)	ND(10)	ND(2.0)
Chloroethane	ug/L	ND(10)	ND(20)	ND(2.0)
Chloroform	ug/L	ND(10)	ND(10)	ND(2.0)
Chloromethane	ug/L	ND(10)	ND(20)	ND(2.0)
cis-1,2-Dichloroethene	ug/L	ND(10)	ND(10)	ND(2.0)
cis-1,3-Dichloropropene	ug/L	ND(10)	ND(10)	ND(2.0)
Ethylbenzene	ug/L	ND(10)	ND(10)	2.2
Methylene chloride	ug/L	ND(10)	ND(10)	ND(2.0)
Styrene	ug/L	12	ND(10)	11
Tetrachloroethene	ug/L	ND(10)	ND(10)	ND(2.0)
Toluene	ug/L	96	77	80
trans-1,2-Dichloroethene	ug/L	ND(10)	ND(10)	ND(2.0)
trans-1,3-Dichloropropene	ug/L	ND(10)	ND(10)	ND(2.0)
Trichloroethene	ug/L	ND(10)	ND(10)	ND(2.0)
Vinyl chloride	ug/L	ND(10)	ND(20)	ND(2.0)
Xylene (total)	ug/L	62	47	50
Semi - Volatiles				
1,2,4-Trichlorobenzene	ug/L	ND(2000)	ND(10000)	ND(10000)
1,2-Dichlorobenzene	ug/L	ND(2000)	ND(10000)	ND(10000)
1,3-Dichlorobenzene	ug/L	ND(2000)	ND(10000)	ND(10000)
1,4-Dichlorobenzene	ug/L	ND(2000)	ND(10000)	ND(10000)
2,4,5-Trichlorophenol	ug/L	ND(5000)	ND(25000)	ND(25000)
2,4,6-Trichlorophenol	ug/L	ND(2000)	ND(10000)	ND(10000)
2,4-Dichlorophenol	ug/L	ND(2000)	ND(10000)	ND(10000)
2,4-Dimethylphenol	ug/L	6000	ND(10000)	ND(10000)
2,4-Dinitrophenol	ug/L	ND(5000)	ND(25000)	ND(25000)
2,4-Dinitrotoluene	ug/L	ND(2000)	ND(10000)	ND(10000)
2,6-Dinitrotoluene	ug/L	ND(2000)	ND(10000)	ND(10000)
2-Chloronaphthalene	ug/L	ND(2000)	ND(10000)	ND(10000)
2-Chlorophenol	ug/L	ND(2000)	ND(10000)	ND(10000)
2-Methyl naphthalene	ug/L	ND(2000)	ND(10000)	ND(10000)

GROUNDWATER ANALYTICAL RESULTS - EW-2
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-2*	*EW-2*	*EW-2*
Sample ID:		*GW-110300-WP-428*	*GW-111000-WP-527*	*GW-111700-WP-633*
Sample Date:		*11/3/2000*	*11/10/2000*	*11/17/2000*
Parameter	*Unit*			
2-Methylphenol	ug/L	17000	12000	12000
2-Nitroaniline	ug/L	ND(5000)	ND(25000)	ND(25000)
2-Nitrophenol	ug/L	ND(2000)	ND(10000)	ND(10000)
3,3'-Dichlorobenzidine	ug/L	ND(2000)	ND(10000)	ND(10000)
3-Nitroaniline	ug/L	ND(5000)	ND(25000)	ND(25000)
4,6-Dinitro-2-methylphenol	ug/L	ND(5000)	ND(25000)	ND(25000)
4-Bromophenyl phenyl ether	ug/L	ND(2000)	ND(10000)	ND(10000)
4-Chloro-3-methylphenol	ug/L	ND(2000)	ND(10000)	ND(10000)
4-Chloroaniline	ug/L	ND(2000)	ND(10000)	ND(10000)
4-Chlorophenyl phenyl ether	ug/L	ND(2000)	ND(10000)	ND(10000)
4-Methylphenol	ug/L	53000	37000	35000
4-Nitroaniline	ug/L	ND(5000)	ND(25000)	ND(25000)
4-Nitrophenol	ug/L	ND(5000)	ND(25000)	ND(25000)
Acenaphthene	ug/L	ND(2000)	ND(10000)	ND(10000)
Acenaphthylene	ug/L	ND(2000)	ND(10000)	ND(10000)
Anthracene	ug/L	ND(2000)	ND(10000)	ND(10000)
Benzo(a)anthracene	ug/L	ND(2000)	ND(10000)	ND(10000)
Benzo(a)pyrene	ug/L	ND(2000)	ND(10000)	ND(10000)
Benzo(b)fluoranthene	ug/L	ND(2000)	ND(10000)	ND(10000)
Benzo(g,h,i)perylene	ug/L	ND(2000)	ND(10000)	ND(10000)
Benzo(k)fluoranthene	ug/L	ND(2000)	ND(10000)	ND(10000)
bis(2-Chloroethoxy)methane	ug/L	ND(2000)	ND(10000)	ND(10000)
bis(2-Chloroethyl)ether	ug/L	ND(2000)	ND(10000)	ND(10000)
bis(2-Chloroisopropyl)ether	ug/L	ND(2000)	ND(10000)	ND(10000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(2000)	ND(10000)	ND(10000)
Butyl benzylphthalate	ug/L	ND(2000)	ND(10000)	ND(10000)
Carbazole	ug/L	ND(2000)	ND(10000)	ND(10000)
Chrysene	ug/L	ND(2000)	ND(10000)	ND(10000)
Dibenz(a,h)anthracene	ug/L	ND(2000)	ND(10000)	ND(10000)
Dibenzofuran	ug/L	ND(2000)	ND(10000)	ND(10000)
Diethyl phthalate	ug/L	ND(2000)	ND(10000)	ND(10000)
Dimethyl phthalate	ug/L	ND(2000)	ND(10000)	ND(10000)
Di-n-butylphthalate	ug/L	ND(2000)	ND(10000)	ND(10000)
Di-n-octyl phthalate	ug/L	ND(2000)	ND(10000)	ND(10000)
Fluoranthene	ug/L	ND(2000)	ND(10000)	ND(10000)
Fluorene	ug/L	ND(2000)	ND(10000)	ND(10000)
Hexachlorobenzene	ug/L	ND(2000)	ND(10000)	ND(10000)
Hexachlorobutadiene	ug/L	ND(2000)	ND(10000)	ND(10000)
Hexachlorocyclopentadiene	ug/L	ND(2000)	ND(10000)	ND(10000)
Hexachloroethane	ug/L	ND(2000)	ND(10000)	ND(10000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(2000)	ND(10000)	ND(10000)
Isophorone	ug/L	ND(2000)	ND(10000)	ND(10000)
Naphthalene	ug/L	ND(2000)	ND(10000)	ND(10000)
Nitrobenzene	ug/L	ND(2000)	ND(10000)	ND(10000)
N-Nitrosodi-n-propylamine	ug/L	ND(2000)	ND(10000)	ND(10000)
N-Nitrosodiphenylamine	ug/L	ND(2000)	ND(10000)	ND(10000)
Pentachlorophenol	ug/L	ND(5000)	ND(25000)	ND(25000)
Phenanthrene	ug/L	ND(2000)	ND(10000)	ND(10000)
Phenol	ug/L	68000	49000	53000
Pyrene	ug/L	ND(2000)	ND(10000)	ND(10000)
Metals				

TABLE F.12

GROUNDWATER ANALYTICAL RESULTS - EW-2
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-2*	*EW-2*	*EW-2*
Sample ID:		*GW-110300-WP-428*	*GW-111000-WP-527*	*GW-111700-WP-633*
Sample Date:		*11/3/2000*	*11/10/2000*	*11/17/2000*
Parameter	*Unit*			
Arsenic	ug/L	4900	4600	3700
General Chemistry				
Alkalinity, Total (As CaCO3)	mg/L	850	850	730
Ammonia	mg/L	370	410	320
Chemical Oxygen Demand (COD)	mg/L	1500	500	980
Cyanide (total)	mg/L	0.074	0.046	0.073
Nitrate (as N)	mg/L	ND(0.20)	ND(0.20)	0.21
Phenolics (Total)	mg/L	260	240	190
Thiocyanate	mg/L	230	700	1500
Total Suspended Solids (TSS)	mg/L	ND(10)	ND(10)	ND(10)

TABLE F.13

GROUNDWATER ANAL CAL RESULTS - EW-3
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*
Sample ID:		*GW-100900-WP-044*	*GW-101100-WP-072*	*GW-101400-WP-110*	*GW-101700-WP-152*	*GW-101900-WP-173*	*GW-102100-WP-203*	*GW-102800-WP-320*	*GW-110300-WP-429*	*GW-111000-WP-528*
Sample Date:		*10/9/2000*	*10/11/2000*	*10/14/2000*	*10/17/2000*	*10/19/2000*	*10/21/2000*	*10/28/2000*	*11/3/2000*	*11/10/2000*
Parameter	*Unit*									
Volatiles										
1,1,1-Trichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2-Trichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloropropane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
2-Butanone	ug/L	62	51	ND(50)	180	140	85	ND(50)	ND(50)	ND(50)
2-Hexanone	ug/L	ND(25)	ND(5.0)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
4-Methyl-2-pentanone	ug/L	ND(25)	ND(5.0)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
Acetone	ug/L	310	260	230	1200	780	520	150	160	110
Benzene	ug/L	790	680	600	1700	1200	900	300	270	240
Bromodichloromethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromoform	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromomethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(20)
Carbon disulfide	ug/L	9 7	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon tetrachloride	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobenzene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobromomethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(20)
Chloroform	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloromethane	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(20)
cis-1,2-Dichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,3-Dichloropropene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Ethylbenzene	ug/L	8.4	7.7	ND(10)	ND(10)	13	ND(10)	ND(10)	ND(10)	31
Methylene chloride	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Styrene	ug/L	39	39	34	100	73	51	17	14	11
Tetrachloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Toluene	ug/L	310	250	220	680	520	380	130	110	95
trans-1,2-Dichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
trans-1,3-Dichloropropene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Trichloroethene	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Vinyl chloride	ug/L	ND(5.0)	ND(1.0)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(20)
Xylene (total)	ug/L	200	170	140	120	320	230	74	66	53
Semi - Volatiles										
1,2,4-Trichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
1,2-Dichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
1,3-Dichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
1,4-Dichlorobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
2,4,5-Trichlorophenol	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)	ND(5100)	ND(25000)
2,4,6-Trichlorophenol	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
2,4-Dichlorophenol	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
2,4-Dimethylphenol	ug/L	21000	13000	16000	ND(15000)	12000	ND(10000)	6300	5100	ND(10000)
2,4-Dinitrophenol	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)	ND(5100)	ND(25000)
2,4-Dinitrotoluene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
2,6-Dinitrotoluene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
2-Chloronaphthalene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
2-Chlorophenol	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
2-Methyl naphthalene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)

GROUNDWATER ANALYTICAL RESULTS - EW-3
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*
Sample ID:		*GW-100900-WP-044*	*GW-101100-WP-072*	*GW-101400-WP-110*	*GW-101700-WP-152*	*GW-101900-WP-173*	*GW-102100-WP-203*	*GW-102800-WP-320*	*GW-110300-WP-429*	*GW-111000-WP-528*
Sample Date:		*10/9/2000*	*10/11/2000*	*10/14/2000*	*10/17/2000*	*10/19/2000*	*10/21/2000*	*10/28/2000*	*11/3/2000*	*11/10/2000*
Parameter	***Unit***									
2-Methylphenol	ug/L	55000	31000	41000	37000	30000	26000	17000	14000	14000
2-Nitroaniline	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)	ND(5100)	ND(25000)
2-Nitrophenol	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
3,3'-Dichlorobenzidine	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
3-Nitroaniline	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)	ND(5100)	ND(25000)
4,6-Dinitro-2-methylphenol	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)	ND(5100)	ND(25000)
4-Bromophenyl phenyl ether	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
4-Chloro-3-methylphenol	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
4-Chloroaniline	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
4-Chlorophenyl phenyl ether	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
4-Methylphenol	ug/L	140000	110000	130000	120000	110000	86000	52000	45000	39000
4-Nitroaniline	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)	ND(5100)	ND(25000)
4-Nitrophenol	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)	ND(5100)	ND(25000)
Acenaphthene	ug/L	ND(10000)	ND(5000) UJ	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Acenaphthylene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Anthracene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Benzo(a)anthracene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Benzo(a)pyrene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Benzo(b)fluoranthene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Benzo(g,h,i)perylene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Benzo(k)fluoranthene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
bis(2-Chloroethoxy)methane	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
bis(2-Chloroethyl)ether	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
bis(2-Chloroisopropyl)ether	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Butyl benzylphthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Carbazole	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Chrysene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Dibenz(a,h)anthracene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Dibenzofuran	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Diethyl phthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Dimethyl phthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Di-n-butylphthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Di-n-octyl phthalate	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Fluoranthene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Fluorene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Hexachlorobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Hexachlorobutadiene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Hexachlorocyclopentadiene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Hexachloroethane	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Isophorone	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Naphthalene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Nitrobenzene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
N-Nitrosodi-n-propylamine	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
N-Nitrosodiphenylamine	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Pentachlorophenol	ug/L	ND(25000)	ND(13000)	ND(13000)	ND(38000)	ND(13000)	ND(25000)	ND(13000)	ND(5100)	ND(25000)
Phenanthrene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Phenol	ug/L	280000	150000	180000	180000	170000	110000	69000	61000	53000
Pyrene	ug/L	ND(10000)	ND(5000)	ND(5000)	ND(15000)	ND(5000)	ND(10000)	ND(5000)	ND(2000)	ND(10000)
Metals										

GROUNDWATER ANALYTICAL RESULTS - EW-3
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*	*EW-3*
Sample ID:		*GW-100900-WP-044*	*GW-101100-WP-072*	*GW-101400-WP-110*	*GW-101700-WP-152*	*GW-101900-WP-173*	*GW-102100-WP-203*	*GW-102800-WP-320*	*GW-110300-WP-429*	*GW-111000-WP-528*
Sample Date:		*10/9/2000*	*10/11/2000*	*10/14/2000*	*10/17/2000*	*10/19/2000*	*10/21/2000*	*10/28/2000*	*11/3/2000*	*11/10/2000*
Parameter	*Unit*									
Arsenic	ug/L	13000	10000	9300	8000	9400	8000	5100	4400	4000
General Chemistry										
Alkalinity, Total (As CaCO3)	mg/L	2900	2300	2300	1800	1800	1400	1200	670	860
Ammonia	mg/L	1700	1700	1500	890	950	600	530	290	490
Chemical Oxygen Demand (COD)	mg/L	6300	5200	4900	5300	2900	2500	1800	1700	150
Cyanide (total)	mg/L	0.87	0.56	0.61	0.65	0.55	0.036 J	0.016	0.051	0.043
Nitrate (as N)	mg/L	0.23	0.23	ND(0.20)	0.20	0.21	0.25	ND(0.20)	1.6	0.20
Phenolics (Total)	mg/L	990	810	660	820	610	410	340	280	260
Thiocyanate	mg/L	5000	5200	4600	5100	4100	1100	820	150	420
Total Suspended Solids (TSS)	mg/L	19	33	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)

GROUNDWATER ANALYTICAL RESULTS - EW-3
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-3*
Sample ID:		*GW-111700-WP-634*
Sample Date:		*11/17/2000*
Parameter	***Unit***	
Volatiles		
1,1,1-Trichloroethane	ug/L	ND(2.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(2.0)
1,1,2-Trichloroethane	ug/L	ND(2.0)
1,1-Dichloroethane	ug/L	ND(2.0)
1,1-Dichloroethene	ug/L	ND(2.0)
1,2-Dichloroethane	ug/L	ND(2.0)
1,2-Dichloropropane	ug/L	ND(2.0)
2-Butanone	ug/L	17
2-Hexanone	ug/L	ND(10)
4-Methyl-2-pentanone	ug/L	ND(10)
Acetone	ug/L	110
Benzene	ug/L	240
Bromodichloromethane	ug/L	ND(2.0)
Bromoform	ug/L	ND(2.0)
Bromomethane	ug/L	ND(2.0)
Carbon disulfide	ug/L	ND(2.0)
Carbon tetrachloride	ug/L	ND(2.0)
Chlorobenzene	ug/L	ND(2.0)
Chlorobromomethane	ug/L	ND(2.0)
Chloroethane	ug/L	ND(2.0)
Chloroform	ug/L	ND(2.0)
Chloromethane	ug/L	ND(2.0)
cis-1,2-Dichloroethene	ug/L	ND(2.0)
cis-1,3-Dichloropropene	ug/L	ND(2.0)
Ethylbenzene	ug/L	2.3
Methylene chloride	ug/L	ND(2.0)
Styrene	ug/L	13
Tetrachloroethene	ug/L	ND(2.0)
Toluene	ug/L	95
trans-1,2-Dichloroethene	ug/L	ND(2.0)
trans-1,3-Dichloropropene	ug/L	ND(2.0)
Trichloroethene	ug/L	ND(2.0)
Vinyl chloride	ug/L	ND(2.0)
Xylene (total)	ug/L	56
Semi - Volatiles		
1,2,4-Trichlorobenzene	ug/L	ND(10000)
1,2-Dichlorobenzene	ug/L	ND(10000)
1,3-Dichlorobenzene	ug/L	ND(10000)
1,4-Dichlorobenzene	ug/L	ND(10000)
2,4,5-Trichlorophenol	ug/L	ND(25000)
2,4,6-Trichlorophenol	ug/L	ND(10000)
2,4-Dichlorophenol	ug/L	ND(10000)
2,4-Dimethylphenol	ug/L	ND(10000)
2,4-Dinitrophenol	ug/L	ND(25000)
2,4-Dinitrotoluene	ug/L	ND(10000)
2,6-Dinitrotoluene	ug/L	ND(10000)
2-Chloronaphthalene	ug/L	ND(10000)
2-Chlorophenol	ug/L	ND(10000)
2-Methyl naphthalene	ug/L	ND(10000)

GROUNDWATER ANALYTICAL RESULTS - EW-3
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-3*
Sample ID:		*GW-111700-WP-634*
Sample Date:		*11/17/2000*
Parameter	***Unit***	
2-Methylphenol	ug/L	14000
2-Nitroaniline	ug/L	ND(25000)
2-Nitrophenol	ug/L	ND(10000)
3,3'-Dichlorobenzidine	ug/L	ND(10000)
3-Nitroaniline	ug/L	ND(25000)
4,6-Dinitro-2-methylphenol	ug/L	ND(25000)
4-Bromophenyl phenyl ether	ug/L	ND(10000)
4-Chloro-3-methylphenol	ug/L	ND(10000)
4-Chloroaniline	ug/L	ND(10000)
4-Chlorophenyl phenyl ether	ug/L	ND(10000)
4-Methylphenol	ug/L	42000
4-Nitroaniline	ug/L	ND(25000)
4-Nitrophenol	ug/L	ND(25000)
Acenaphthene	ug/L	ND(10000)
Acenaphthylene	ug/L	ND(10000)
Anthracene	ug/L	ND(10000)
Benzo(a)anthracene	ug/L	ND(10000)
Benzo(a)pyrene	ug/L	ND(10000)
Benzo(b)fluoranthene	ug/L	ND(10000)
Benzo(g,h,i)perylene	ug/L	ND(10000)
Benzo(k)fluoranthene	ug/L	ND(10000)
bis(2-Chloroethoxy)methane	ug/L	ND(10000)
bis(2-Chloroethyl)ether	ug/L	ND(10000)
bis(2-Chloroisopropyl)ether	ug/L	ND(10000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(10000)
Butyl benzylphthalate	ug/L	ND(10000)
Carbazole	ug/L	ND(10000)
Chrysene	ug/L	ND(10000)
Dibenz(a,h)anthracene	ug/L	ND(10000)
Dibenzofuran	ug/L	ND(10000)
Diethyl phthalate	ug/L	ND(10000)
Dimethyl phthalate	ug/L	ND(10000)
Di-n-butylphthalate	ug/L	ND(10000)
Di-n-octyl phthalate	ug/L	ND(10000)
Fluoranthene	ug/L	ND(10000)
Fluorene	ug/L	ND(10000)
Hexachlorobenzene	ug/L	ND(10000)
Hexachlorobutadiene	ug/L	ND(10000)
Hexachlorocyclopentadiene	ug/L	ND(10000)
Hexachloroethane	ug/L	ND(10000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(10000)
Isophorone	ug/L	ND(10000)
Naphthalene	ug/L	ND(10000)
Nitrobenzene	ug/L	ND(10000)
N-Nitrosodi-n-propylamine	ug/L	ND(10000)
N-Nitrosodiphenylamine	ug/L	ND(10000)
Pentachlorophenol	ug/L	ND(25000)
Phenanthrene	ug/L	ND(10000)
Phenol	ug/L	59000
Pyrene	ug/L	ND(10000)
Metals		

GROUNDWATER ANALYTICAL RESULTS - EW-3
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-3*
Sample ID:		*GW-111700-WP-634*
Sample Date:		*11/17/2000*
Parameter	*Unit*	
Arsenic	ug/L	3500
General Chemistry		
Alkalinity, Total (As CaCO3)	mg/L	810
Ammonia	mg/L	430
Chemical Oxygen Demand (COD)	mg/L	920
Cyanide (total)	mg/L	0.014
Nitrate (as N)	mg/L	0.21
Phenolics (Total)	mg/L	200
Thiocyanate	mg/L	1600
Total Suspended Solids (TSS)	mg/L	ND(10)

APPENDIX G

BROMIDE GROUNDWATER ANALYTICAL RESULTS – E/R UNIT

TABLE G-1

GROUNDWATER ANALYTICAL RESULTS FOR BROMIDE
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Bromide mg/L*
EW-1	GW-102300-WP-234	10/23/2000	1 8
EW-1	GW-102400-WP-248	10/24/2000	1.1
EW-1	GW-102500-WP-261	10/25/2000	1.3
EW-1	GW-102600-WP-280	10/26/2000	0.97
EW-1	GW-102700-WP-299	10/27/2000	1.2
EW-1	GW-102800-WP-318	10/28/2000	0.71 J
EW-1	GW-102900-WP-337	10/29/2000	1.1
EW-1	GW-103000-WP-353	10/30/2000	18
EW-1	GW-103100-WP-381	10/31/2000	39
EW-1	GW-110100-WP-394	11/1/2000	28
EW-1	GW-110200-WP-414	11/2/2000	29
EW-1	GW-110300-WP-427	11/3/2000	23 J
EW-1	GW-110400-WP-440	11/4/2000	23
EW-1	GW-110500-WP-460	11/5/2000	17
EW-1	GW-110600-WP-468	11/6/2000	15
EW-1	GW-110700-WP-486	11/7/2000	11
EW-1	GW-110800-WP-499	11/8/2000	8.8
EW-1	GW-110900-WP-513	11/9/2000	7.4
EW-1	GW-111000-WP-526	11/10/2000	7.4
EW-1	GW-111100-WP-540	11/11/2000	4.5
EW-1	GW-111200-WP-553	11/12/2000	5.0
EW-1	GW-111300-WP-572	11/13/2000	4.5
EW-1	GW-111400-WP-586	11/14/2000	3 7
EW-1	GW-111500-WP-599	11/15/2000	3.8
EW-1	GW-111600-WP-619	11/16/2000	4 0
EW-1	GW-111700-WP-632	11/17/2000	3.2 J
EW-1	GW-111800-WP-646	11/18/2000	2.5
EW-1	GW-111900-WP-664	11/19/2000	2.9
EW-1	GW-112000-WP-678	11/20/2000	2.4
EW-2	GW-102300-WP-235	10/23/2000	10
EW-2	GW-102400-WP-249	10/24/2000	10
EW-2	GW-102500-WP-262	10/25/2000	10
EW-2	GW-102600-WP-281	10/26/2000	9.3
EW-2	GW-102700-WP-300	10/27/2000	9.1
EW-2	GW-102800-WP-319	10/28/2000	8.8 J
EW-2	GW-102900-WP-338	10/29/2000	8.1
EW-2	GW-103000-WP-354	10/30/2000	8.0
EW-2	GW-103100-WP-382	10/31/2000	7.3
EW-2	GW-110100-WP-395	11/1/2000	7.8
EW-2	GW-110200-WP-415	11/2/2000	8.7
EW-2	GW-110300-WP-428	11/3/2000	7 6
EW-2	GW-110400-WP-441	11/4/2000	9.1
EW-2	GW-110500-WP-461	11/5/2000	8.6
EW-2	GW-110600-WP-469	11/6/2000	8.8
EW-2	GW-110700-WP-487	11/7/2000	1.9
EW-2	GW-110800-WP-500	11/8/2000	1.7
EW-2	GW-110900-WP-514	11/9/2000	7.8
EW-2	GW-111000-WP-527	11/10/2000	7.3
EW-2	GW-111100-WP-541	11/11/2000	7.4
EW-2	GW-111200-WP-554	11/12/2000	1.7
EW-2	GW-111300-WP-573	11/13/2000	1.7
EW-2	GW-111400-WP-587	11/14/2000	6.4
EW-2	GW-111500-WP-600	11/15/2000	6.6
EW-2	GW-111600-WP-620	11/16/2000	6.4
EW-2	GW-111700-WP-633	11/17/2000	6.8 J
EW-2	GW-111800-WP-647	11/18/2000	6.2
EW-2	GW-111900-WP-665	11/19/2000	5.4
EW-2	GW-112000-WP-679	11/20/2000	6.9
EW-3	GW-102300-WP-236	10/23/2000	9.0
EW-3	GW-102400-WP-250	10/24/2000	13
EW-3	GW-102500-WP-263	10/25/2000	10
EW-3	GW-102600-WP-282	10/26/2000	9.6
EW-3	GW-102700-WP-301	10/27/2000	9 3
EW-3	GW-102800-WP-320	10/28/2000	9.1 J
EW-3	GW-102900-WP-339	10/29/2000	8.3
EW-3	GW-103000-WP-355	10/30/2000	8 3
EW-3	GW-103100-WP-383	10/31/2000	7.9
EW-3	GW-110100-WP-396	11/1/2000	8.4
EW-3	GW-110200-WP-416	11/2/2000	8.4
EW-3	GW-110300-WP-429	11/3/2000	7.0
EW-3	GW-110400-WP-442	11/4/2000	8 8
EW-3	GW-110500-WP-462	11/5/2000	9.3
EW-3	GW-110600-WP-470	11/6/2000	8 8
EW-3	GW-110700-WP-488	11/7/2000	2.0
EW-3	GW-110800-WP-501	11/8/2000	8.0

GROUNDWATER ANALYTICAL RESULTS FOR BROMIDE
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	Sample Name	Date	Bromide mg/L
EW-3	GW-110900-WP-515	11/9/2000	8.4
EW-3	GW-111000-WP-528	11/10/2000	8.0
EW-3	GW-111100-WP-542	11/11/2000	7.9
EW-3	GW-111200-WP-555	11/12/2000	1.9
EW-3	GW-111300-WP-574	11/13/2000	1.8
EW-3	GW-111400-WP-588	11/14/2000	6.9
EW-3	GW-111500-WP-601	11/15/2000	6 6
EW-3	GW-111600-WP-621	11/16/2000	7.1
EW-3	GW-111700-WP-634	11/17/2000	7.2 J
EW-3	GW-111800-WP-648	11/18/2000	5.5
EW-3	GW-111900-WP-666	11/19/2000	7.2
EW-3	GW-112000-WP-680	11/20/2000	7.2
RW-1	GW-102300-WP-231	10/23/2000	ND(0.20)
RW-2	GW-102300-WP-232	10/23/2000	ND(0.20)
RW-2	GW-102400-WP-237	10/24/2000	18000
RW-2	GW-102500-WP-264	10/25/2000	ND(0.20)
RW-2	GW-102600-WP-283	10/26/2000	ND(0.20)
RW-2	GW-102700-WP-302	10/27/2000	2000
RW-2	GW-102800-WP-321	10/28/2000	2.8
RW-2	GW-102900-WP-340	10/29/2000	0.34
RW-2	GW-103000-WP-352	10/30/2000	0.37
RW-2	GW-110100-WP-397	11/1/2000	0.36
RW-2	GW-110400-WP-443	11/4/2000	1.0
RW-2	GW-110800-WP-502	11/8/2000	0.48
RW-2	GW-111000-WP-529	11/10/2000	ND(0.20)
RW-2	GW-111300-WP-575	11/13/2000	ND(0.20)
RW-2	GW-111500-WP-602	11/15/2000	ND(0.20)
RW-2	GW-111700-WP-635	11/17/2000	0.51
RW-2	GW-112000-WP-681	11/20/2000	0.46
RW-3	GW-102300-WP-233	10/23/2000	ND(0.20)
WN-1A	GW-102300-WP-221	10/23/2000	0 48
WN-1A	GW-102400-WP-238	10/24/2000	1.1
WN-1A	GW-102500-WP-251	10/25/2000	0.45
WN-1A	GW-102600-WP-270	10/26/2000	0.44
WN-1A	GW-102700-WP-289	10/27/2000	0.46
WN-1A	GW-102800-WP-308	10/28/2000	0.44
WN-1A	GW-102900-WP-327	10/29/2000	0.45
WN-1A	GW-103000-WP-347	10/30/2000	0.56
WN-1A	GW-103100-WP-371	10/31/2000	0.50
WN-1A	GW-110100-WP-384	11/1/2000	0.50
WN-1A	GW-110200-WP-404	11/2/2000	0.57
WN-1A	GW-110300-WP-417	11/3/2000	0.44
WN-1A	GW-110400-WP-430	11/4/2000	0.51
WN-1A	GW-110500-WP-450	11/5/2000	0.52
WN-1A	GW-110600-WP-471	11/6/2000	0.49
WN-1A	GW-110700-WP-476	11/7/2000	0.63
WN-1A	GW-110800-WP-489	11/8/2000	0.52
WN-1A	GW-110900-WP-503	11/9/2000	0.47
WN-1A	GW-111000-WP-516	11/10/2000	0.47
WN-1A	GW-111100-WP-530	11/11/2000	0.42
WN-1A	GW-111200-WP-543	11/12/2000	0 46
WN-1A	GW-111300-WP-562	11/13/2000	0.42
WN-1A	GW-111400-WP-576	11/14/2000	0.36
WN-1A	GW-111500-WP-589	11/15/2000	0.34
WN-1A	GW-111600-WP-609	11/16/2000	0.36
WN-1A	GW-111700-WP-622	11/17/2000	0.33
WN-1A	GW-111800-WP-636	11/18/2000	0.38
WN-1A	GW-111900-WP-654	11/19/2000	0.36
WN-1A	GW-112000-WP-668	11/20/2000	0.33
WN-1B	GW-102300-WP-222	10/23/2000	0.33
WN-1B	GW-102400-WP-239	10/24/2000	0.46
WN-1B	GW-102500-WP-252	10/25/2000	0.47
WN-1B	GW-102600-WP-271	10/26/2000	0.44
WN-1B	GW-102700-WP-290	10/27/2000	0.51
WN-1B	GW-102800-WP-309	10/28/2000	0.52
WN-1B	GW-102900-WP-328	10/29/2000	0.54
WN-1B	GW-103000-WP-348	10/30/2000	0.56
WN-1B	GW-103100-WP-372	10/31/2000	0.58
WN-1B	GW-110100-WP-385	11/1/2000	0.57
WN-1B	GW-110200-WP-405	11/2/2000	0 48
WN-1B	GW-110300-WP-418	11/3/2000	0.53
WN-1B	GW-110400-WP-431	11/4/2000	0.59
WN-1B	GW-110500-WP-451	11/5/2000	0 56
WN-1B	GW-110600-WP-472	11/6/2000	0 60
WN-1B	GW-110700-WP-477	11/7/2000	0 60
WN-1B	GW-110800-WP-490	11/8/2000	0.61

GROUNDWATER ANALYTICAL RESULTS FOR BROMIDE
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Bromide mg/L*
WN-1B	GW-110900-WP-504	11/9/2000	0.55
WN-1B	GW-111000-WP-517	11/10/2000	0.64
WN-1B	GW-111100-WP-531	11/11/2000	0.54
WN-1B	GW-111200-WP-544	11/12/2000	0.59
WN-1B	GW-111300-WP-563	11/13/2000	0.52
WN-1B	GW-111400-WP-577	11/14/2000	0 51
WN-1B	GW-111500-WP-590	11/15/2000	0.43
WN-1B	GW-111600-WP-610	11/16/2000	0.42
WN-1B	GW-111700-WP-623	11/17/2000	0.47
WN-1B	GW-111800-WP-637	11/18/2000	0.45
WN-1B	GW-111900-WP-655	11/19/2000	0.42
WN-1C	GW-102300-WP-223	10/23/2000	0.37
WN-1C	GW-102400-WP-240	10/24/2000	0.38
WN-1C	GW-102500-WP-253	10/25/2000	0.40
WN-1C	GW-102600-WP-272	10/26/2000	0.40
WN-1C	GW-102700-WP-291	10/27/2000	0.58
WN-1C	GW-102800-WP-310	10/28/2000	0 47
WN-1C	GW-102900-WP-329	10/29/2000	0 46
WN-1C	GW-103000-WP-349	10/30/2000	0.42
WN-1C	GW-103100-WP-373	10/31/2000	0.41
WN-1C	GW-110100-WP-386	11/1/2000	0.42
WN-1C	GW-110200-WP-406	11/2/2000	54
WN-1C	GW-110300-WP-419	11/3/2000	0.43
WN-1C	GW-110400-WP-432	11/4/2000	0.50
WN-1C	GW-110500-WP-452	11/5/2000	0.94
WN-1C	GW-110600-WP-473	11/6/2000	2.4
WN-1C	GW-110700-WP-478	11/7/2000	76
WN-1C	GW-110800-WP-491	11/8/2000	3.0
WN-1C	GW-110900-WP-505	11/9/2000	2.1
WN-1C	GW-111000-WP-518	11/10/2000	2.7
WN-1C	GW-111100-WP-532	11/11/2000	4.4
WN-1C	GW-111200-WP-545	11/12/2000	4.5
WN-1C	GW-111300-WP-564	11/13/2000	2.6
WN-1C	GW-111400-WP-578	11/14/2000	1.6
WN-1C	GW-111500-WP-591	11/15/2000	1.1
WN-1C	GW-111600-WP-611	11/16/2000	0.97
WN-1C	GW-111700-WP-624	11/17/2000	1.3
WN-1C	GW-111800-WP-638	11/18/2000	1.3
WN-1C	GW-111900-WP-656	11/19/2000	0.85
WN-1C	GW-112000-WP-670	11/20/2000	0.86
WN-1D	GW-102300-WP-224	10/23/2000	0.31
WN-1D	GW-102400-WP-241	10/24/2000	0.34
WN-1D	GW-102500-WP-254	10/25/2000	0.35
WN-1D	GW-102600-WP-273	10/26/2000	0.31
WN-1D	GW-102700-WP-292	10/27/2000	0.41
WN-1D	GW-102800-WP-311	10/28/2000	0.37
WN-1D	GW-102800-WP-325	10/28/2000	ND(0.20) UJ
WN-1D	GW-102900-WP-330	10/29/2000	0.40
WN-1D	GW-103000-WP-350	10/30/2000	0.34
WN-1D	GW-103100-WP-374	10/31/2000	5.5
WN-1D	GW-110100-WP-387	11/1/2000	81
WN-1D	GW-110200-WP-407	11/2/2000	340
WN-1D	GW-110300-WP-420	11/3/2000	30
WN-1D	GW-110400-WP-433	11/4/2000	15
WN-1D	GW-110500-WP-453	11/5/2000	10
WN-1D	GW-110600-WP-474	11/6/2000	2.7
WN-1D	GW-110700-WP-479	11/7/2000	0.58
WN-1D	GW-110800-WP-492	11/8/2000	0.96
WN-1D	GW-110900-WP-506	11/9/2000	1.3
WN-1D	GW-111000-WP-519	11/10/2000	0.85
WN-1D	GW-111100-WP-533	11/11/2000	0.82
WN-1D	GW-111200-WP-546	11/12/2000	0.99
WN-1D	GW-111300-WP-565	11/13/2000	0.50
WN-1D	GW-111400-WP-579	11/14/2000	0 42
WN-1D	GW-111500-WP-592	11/15/2000	0.68
WN-1D	GW-111600-WP-612	11/16/2000	0.30
WN-1D	GW-111700-WP-625	11/17/2000	0.32
WN-1D	GW-111800-WP-639	11/18/2000	0 28
WN-1D	GW-111900-WP-657	11/19/2000	0.31
WN-1D	GW-112000-WP-671	11/20/2000	0 29
WN-1E	GW-102300-WP-225	10/23/2000	0 88
WN-1E	GW-102400-WP-242	10/24/2000	0.87
WN-1E	GW-102500-WP-255	10/25/2000	0.82
WN-1E	GW-102600-WP-274	10/26/2000	0.66
WN-1E	GW-102700-WP-293	10/27/2000	1.0
WN-1E	GW-102800-WP-312	10/28/2000	1.3

GROUNDWATER ANALYTICAL RESULTS FOR BROMIDE
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
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Location	Sample Name	Date	Bromide mg/L
WN-1E	GW-102800-WP-326	10/28/2000	360 J
WN-1E	GW-102900-WP-331	10/29/2000	1400
WN-1E	GW-103000-WP-351	10/30/2000	960
WN-1E	GW-103100-WP-375	10/31/2000	500
WN-1E	GW-110100-WP-388	11/1/2000	480
WN-1E	GW-110200-WP-408	11/2/2000	0.43
WN-1E	GW-110300-WP-421	11/3/2000	250
WN-1E	GW-110400-WP-434	11/4/2000	190
WN-1E	GW-110500-WP-454	11/5/2000	130
WN-1E	GW-110600-WP-475	11/6/2000	110
WN-1E	GW-110700-WP-480	11/7/2000	3.2
WN-1E	GW-110800-WP-493	11/8/2000	67
WN-1E	GW-110900-WP-507	11/9/2000	66
WN-1E	GW-111000-WP-520	11/10/2000	55
WN-1E	GW-111100-WP-534	11/11/2000	49
WN-1E	GW-111200-WP-547	11/12/2000	40
WN-1E	GW-111300-WP-566	11/13/2000	32
WN-1E	GW-111400-WP-580	11/14/2000	27
WN-1E	GW-111500-WP-593	11/15/2000	30
WN-1E	GW-111600-WP-613	11/16/2000	24
WN-1E	GW-111700-WP-626	11/17/2000	26
WN-1E	GW-111800-WP-640	11/18/2000	15
WN-1E	GW-111900-WP-658	11/19/2000	16
WN-1E	GW-112000-WP-672	11/20/2000	17
WN-2A	GW-102300-WP-226	10/23/2000	0.54
WN-2A	GW-102400-WP-243	10/24/2000	0.53
WN-2A	GW-102500-WP-256	10/25/2000	0.52
WN-2A	GW-102600-WP-275	10/26/2000	0.49
WN-2A	GW-102700-WP-294	10/27/2000	0.51
WN-2A	GW-102800-WP-313	10/28/2000	0.47
WN-2A	GW-102900-WP-332	10/29/2000	0.57
WN-2A	GW-103000-WP-356	10/30/2000	0.43
WN-2A	GW-103100-WP-376	10/31/2000	0.45
WN-2A	GW-110100-WP-389	11/1/2000	0.44
WN-2A	GW-110200-WP-409	11/2/2000	0.42
WN-2A	GW-110300-WP-422	11/3/2000	0.40
WN-2A	GW-110400-WP-435	11/4/2000	0.42
WN-2A	GW-110500-WP-455	11/5/2000	0.41
WN-2A	GW-110600-WP-463	11/6/2000	0.45
WN-2A	GW-110700-WP-481	11/7/2000	0.40
WN-2A	GW-110800-WP-494	11/8/2000	0.41
WN-2A	GW-110900-WP-508	11/9/2000	0.40
WN-2A	GW-111000-WP-521	11/10/2000	0.41
WN-2A	GW-111100-WP-535	11/11/2000	0.37
WN-2A	GW-111200-WP-548	11/12/2000	0.37
WN-2A	GW-111300-WP-567	11/13/2000	0.37
WN-2A	GW-111400-WP-581	11/14/2000	ND(0.20)
WN-2A	GW-111500-WP-594	11/15/2000	0.29
WN-2A	GW-111600-WP-614	11/16/2000	0.28
WN-2A	GW-111700-WP-627	11/17/2000	0.27
WN-2A	GW-111800-WP-641	11/18/2000	0.30
WN-2A	GW-111900-WP-659	11/19/2000	0.26
WN-2A	GW-112000-WP-673	11/20/2000	0.26
WN-2B	GW-102300-WP-227	10/23/2000	0.59
WN-2B	GW-102400-WP-244	10/24/2000	0.48
WN-2B	GW-102500-WP-257	10/25/2000	0.50
WN-2B	GW-102600-WP-276	10/26/2000	0.46
WN-2B	GW-102700-WP-295	10/27/2000	0.51
WN-2B	GW-102800-WP-314	10/28/2000	0.46
WN-2B	GW-102900-WP-333	10/29/2000	0.43
WN-2B	GW-103000-WP-357	10/30/2000	0.41
WN-2B	GW-103100-WP-377	10/31/2000	0.43
WN-2B	GW-110100-WP-390	11/1/2000	0.40
WN-2B	GW-110200-WP-410	11/2/2000	0.53
WN-2B	GW-110300-WP-423	11/3/2000	0.37
WN-2B	GW-110400-WP-436	11/4/2000	0 42
WN-2B	GW-110500-WP-456	11/5/2000	0.44
WN-2B	GW-110600-WP-464	11/6/2000	0 47
WN-2B	GW-110700-WP-482	11/7/2000	0 43
WN-2B	GW-110800-WP-495	11/8/2000	0.46
WN-2B	GW-110900-WP-509	11/9/2000	0 43
WN-2B	GW-111000-WP-522	11/10/2000	0.45
WN-2B	GW-111100-WP-536	11/11/2000	0 42
WN-2B	GW-111200-WP-549	11/12/2000	0 41
WN-2B	GW-111300-WP-568	11/13/2000	0.44
WN-2B	GW-111400-WP-582	11/14/2000	0.32

GROUNDWATER ANALYTICAL RESULTS FOR BROMIDE
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	Sample Name	Date	Bromide mg/L
WN-2B	GW-111500-WP-595	11/15/2000	0.33
WN-2B	GW-111600-WP-615	11/16/2000	0.32
WN-2B	GW-111700-WP-628	11/17/2000	1.5
WN-2B	GW-111800-WP-642	11/18/2000	0.50
WN-2B	GW-111900-WP-660	11/19/2000	0.36
WN-2B	GW-112000-WP-669	11/20/2000	0.46
WN-2B	GW-112000-WP-674	11/20/2000	0.31
WN-2C	GW-102300-WP-228	10/23/2000	0 48
WN-2C	GW-102400-WP-245	10/24/2000	0.43
WN-2C	GW-102500-WP-258	10/25/2000	0.40
WN-2C	GW-102600-WP-277	10/26/2000	0.41
WN-2C	GW-102700-WP-296	10/27/2000	0.44
WN-2C	GW-102800-WP-315	10/28/2000	0.46
WN-2C	GW-102900-WP-334	10/29/2000	0.56
WN-2C	GW-103000-WP-358	10/30/2000	0 65
WN-2C	GW-103100-WP-378	10/31/2000	0.50
WN-2C	GW-110100-WP-391	11/1/2000	0.56
WN-2C	GW-110200-WP-411	11/2/2000	1.2
WN-2C	GW-110300-WP-424	11/3/2000	0.54
WN-2C	GW-110400-WP-437	11/4/2000	0 60
WN-2C	GW-110500-WP-457	11/5/2000	0.76
WN-2C	GW-110600-WP-465	11/6/2000	0.58
WN-2C	GW-110700-WP-483	11/7/2000	0.61
WN-2C	GW-110800-WP-496	11/8/2000	0.58
WN-2C	GW-110900-WP-510	11/9/2000	0.61
WN-2C	GW-111000-WP-523	11/10/2000	0.55
WN-2C	GW-111100-WP-537	11/11/2000	0.81
WN-2C	GW-111200-WP-550	11/12/2000	0.56
WN-2C	GW-111300-WP-569	11/13/2000	0.52
WN-2C	GW-111400-WP-583	11/14/2000	0.42
WN-2C	GW-111500-WP-596	11/15/2000	0.46
WN-2C	GW-111600-WP-616	11/16/2000	0.52
WN-2C	GW-111700-WP-629	11/17/2000	0.55
WN-2C	GW-111800-WP-643	11/18/2000	0.84
WN-2C	GW-111900-WP-661	11/19/2000	0.83
WN-2C	GW-112000-WP-675	11/20/2000	0.76
WN-2D	GW-102300-WP-229	10/23/2000	1.9
WN-2D	GW-102400-WP-246	10/24/2000	1.7
WN-2D	GW-102500-WP-259	10/25/2000	1.4
WN-2D	GW-102600-WP-278	10/26/2000	1.1
WN-2D	GW-102700-WP-297	10/27/2000	1.1
WN-2D	GW-102800-WP-316	10/28/2000	1.2
WN-2D	GW-102900-WP-335	10/29/2000	1 0
WN-2D	GW-103000-WP-359	10/30/2000	1.0
WN-2D	GW-103100-WP-379	10/31/2000	0.78
WN-2D	GW-110100-WP-392	11/1/2000	1.3
WN-2D	GW-110200-WP-412	11/2/2000	10
WN-2D	GW-110300-WP-425	11/3/2000	0.77
WN-2D	GW-110400-WP-438	11/4/2000	1.3
WN-2D	GW-110500-WP-458	11/5/2000	1.0
WN-2D	GW-110600-WP-466	11/6/2000	1.2
WN-2D	GW-110700-WP-484	11/7/2000	0.60
WN-2D	GW-110800-WP-497	11/8/2000	0.65
WN-2D	GW-110900-WP-511	11/9/2000	0.65
WN-2D	GW-111000-WP-524	11/10/2000	0.59
WN-2D	GW-111100-WP-538	11/11/2000	0.52
WN-2D	GW-111200-WP-551	11/12/2000	0.50
WN-2D	GW-111300-WP-570	11/13/2000	0 57
WN-2D	GW-111400-WP-584	11/14/2000	0 43
WN-2D	GW-111500-WP-597	11/15/2000	0.47
WN-2D	GW-111600-WP-617	11/16/2000	0.41
WN-2D	GW-111700-WP-630	11/17/2000	0.40
WN-2D	GW-111800-WP-644	11/18/2000	0 47
WN-2D	GW-111900-WP-662	11/19/2000	0.74
WN-2D	GW-112000-WP-676	11/20/2000	0 64
WN-2E	GW-102300-WP-230	10/23/2000	4.2
WN-2E	GW-102400-WP-247	10/24/2000	4 8
WN-2E	GW-102500-WP-260	10/25/2000	5 5
WN-2E	GW-102600-WP-279	10/26/2000	5 2
WN-2E	GW-102700-WP-298	10/27/2000	4.8
WN-2E	GW-102800-WP-317	10/28/2000	1.5
WN-2E	GW-102900-WP-336	10/29/2000	6 0
WN-2E	GW-103000-WP-360	10/30/2000	6.2
WN-2E	GW-103100-WP-380	10/31/2000	11
WN-2E	GW-110100-WP-393	11/1/2000	11
WN-2E	GW-110200-WP-413	11/2/2000	0 48

GROUNDWATER ANALYTICAL RESULTS FOR BROMIDE
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Location	*Sample Name*	*Date*	*Bromide mg/L*
WN-2E	GW-110300-WP-426	11/3/2000	2.2
WN-2E	GW-110400-WP-439	11/4/2000	15
WN-2E	GW-110500-WP-459	11/5/2000	13
WN-2E	GW-110600-WP-467	11/6/2000	2.1
WN-2E	GW-110700-WP-485	11/7/2000	3.4
WN-2E	GW-110800-WP-498	11/8/2000	3.6
WN-2E	GW-110900-WP-512	11/9/2000	3.0
WN-2E	GW-111000-WP-525	11/10/2000	3.8
WN-2E	GW-111100-WP-539	11/11/2000	19
WN-2E	GW-111200-WP-552	11/12/2000	3.8
WN-2E	GW-111300-WP-571	11/13/2000	2.7
WN-2E	GW-111400-WP-585	11/14/2000	1.9
WN-2E	GW-111500-WP-598	11/15/2000	2.3
WN-2E	GW-111600-WP-618	11/16/2000	2.0
WN-2E	GW-111700-WP-631	11/17/2000	2.2
WN-2E	GW-111800-WP-645	11/18/2000	29
WN-2E	GW-111900-WP-663	11/19/2000	30
WN-2E	GW-112000-WP-677	11/20/2000	39

APPENDIX H

GROUNDWATER ANALYTICAL RESULTS – E UNIT

GROUNDWATER ANALYTICAL RESULTS - WN-3A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*
Sample ID:		*GW-100200-WP-006*	*GW-100400-WP-012*	*GW-100500-WP-019*	*GW-100900-WP-036*	*GW-101600-WP-137*	*GW-101900-WP-175*	*GW-102200-WP-215*
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1 0)	-
1,1,2-Trichloroethane	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,1-Dichloroethane	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,1-Dichloroethene	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,2-Dichloroethane	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,2-Dichloropropane	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
2-Butanone	ug/L	ND(5.0)	-	ND(25)	-	ND(5.0)	ND(5.0)	-
2-Hexanone	ug/L	ND(5.0)	-	ND(25)	-	ND(5.0)	ND(5.0)	-
4-Methyl-2-pentanone	ug/L	ND(5.0)	-	ND(25)	-	ND(5.0)	ND(5.0)	-
Acetone	ug/L	ND(5.0)	-	ND(25)	-	ND(5.0)	ND(5 0)	-
Benzene	ug/L	28	-	18	-	12	13	-
Bromodichloromethane	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Bromoform	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Bromomethane	ug/L	ND(1.0)	-	ND(10)	-	ND(1.0)	ND(1.0)	-
Carbon disulfide	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Carbon tetrachloride	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Chlorobenzene	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Chlorobromomethane	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Chloroethane	ug/L	ND(1.0)	-	ND(10)	-	ND(1.0)	ND(1.0)	-
Chloroform	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Chloromethane	ug/L	ND(1 0)	-	ND(10)	-	ND(1.0)	ND(1.0)	-
cis-1,2-Dichloroethene	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
cis-1,3-Dichloropropene	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	1.2	-	ND(5.0)	-	1.3	1.3	-
Methylene chloride	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Styrene	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Tetrachloroethene	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Toluene	ug/L	15	-	10	-	8.1	9.5	-
trans-1,2-Dichloroethene	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
trans-1,3-Dichloropropene	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1 0)	ND(1.0)	-
Trichloroethene	ug/L	ND(1.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Vinyl chloride	ug/L	ND(1.0)	-	ND(10)	-	ND(1.0)	ND(1.0)	-
Xylene (total)	ug/L	12	-	ND(15)	-	12	12	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
1,2-Dichlorobenzene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
1,3-Dichlorobenzene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
1,4-Dichlorobenzene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
2,4,5-Trichlorophenol	ug/L	ND(130)	-	ND(130)	-	ND(75)	ND(75)	-
2,4,6-Trichlorophenol	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
2,4-Dichlorophenol	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
2,4-Dimethylphenol	ug/L	220	-	130	-	43	91	-
2,4-Dinitrophenol	ug/L	ND(130)	-	ND(130)	-	ND(75)	ND(75)	-
2,4-Dinitrotoluene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
2,6-Dinitrotoluene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
2-Chloronaphthalene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
2-Chlorophenol	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-

TABLE H.1

GROUNDWATER ANALYTICAL RESULTS - WN-3A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*
Sample ID:		*GW-100200-WP-006*	*GW-100400-WP-012*	*GW-100500-WP-019*	*GW-100900-WP-036*	*GW-101600-WP-137*	*GW-101900-WP-175*	*GW-102200-WP-215*
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
2-Methylphenol	ug/L	200	-	140	-	55	110	-
2-Nitroaniline	ug/L	ND(130)	-	ND(130)	-	ND(75)	ND(75)	-
2-Nitrophenol	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
3,3'-Dichlorobenzidine	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
3-Nitroaniline	ug/L	ND(130)	-	ND(130)	-	ND(75)	ND(75)	-
4,6-Dinitro-2-methylphenol	ug/L	ND(130)	-	ND(130)	-	ND(75)	ND(75)	-
4-Bromophenyl phenyl ether	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
4-Chloro-3-methylphenol	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
4-Chloroaniline	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
4-Chlorophenyl phenyl ether	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
4-Methylphenol	ug/L	420	-	340	-	83	220	-
4-Nitroaniline	ug/L	ND(130)	-	ND(130)	-	ND(75)	ND(75)	-
4-Nitrophenol	ug/L	ND(130)	-	ND(130)	-	ND(75)	ND(75)	-
Acenaphthene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Acenaphthylene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Anthracene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Benzo(a)anthracene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Benzo(a)pyrene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Benzo(b)fluoranthene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Benzo(g,h,i)perylene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Benzo(k)fluoranthene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
bis(2-Chloroethoxy)methane	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
bis(2-Chloroethyl)ether	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
bis(2-Chloroisopropyl)ether	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Butyl benzylphthalate	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Carbazole	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Chrysene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Dibenz(a,h)anthracene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Dibenzofuran	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Diethyl phthalate	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Dimethyl phthalate	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Di-n-butylphthalate	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Di-n-octyl phthalate	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Fluoranthene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Fluorene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Hexachlorobenzene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Hexachlorobutadiene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Hexachlorocyclopentadiene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Hexachloroethane	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Isophorone	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Naphthalene	ug/L	95	-	110	-	95	120	-
Nitrobenzene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
N-Nitrosodi-n-propylamine	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
N-Nitrosodiphenylamine	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Pentachlorophenol	ug/L	ND(130)	-	ND(130)	-	ND(75)	ND(75)	-
Phenanthrene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-
Phenol	ug/L	180	-	170	-	ND(30)	68	-
Pyrene	ug/L	ND(50)	-	ND(50)	-	ND(30)	ND(30)	-

GROUNDWATER ANAL. .AL RESULTS - WN-3A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*
Sample ID:		*GW-100200-WP-006*	*GW-100400-WP-012*	*GW-100500-WP-019*	*GW-100900-WP-036*	*GW-101600-WP-137*	*GW-101900-WP-175*	*GW-102200-WP-215*
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	820	870	1000	1000	920	970	1000
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	-	-	-	-	-	-	-
Ammonia	mg/L	-	33	29	30	21	15	17
Cyanide (total)	mg/L	0.055	-	0.052	-	0.058	0.082	-
Nitrate (as N)	mg/L	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	570	1.2	1.6	1.3	0.24 J	0.60	1.2
Thiocyanate	mg/L	250	-	550	-	28	190	-
Total Suspended Solids (TSS)	mg/L	-	-	-	-	-	-	-

TABLE H.1

GROUNDWATER ANALYTICAL RESULTS - WN-3A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*
Sample ID:		*GW-103000-WP-361*	*GW-110200-WP-398*	*GW-110500-WP-444*	*GW-111300-WP-556*	*GW-111600-WP-603*	*GW-111900-WP-649*	*GW-112700-WP-682*
Sample Date:		*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
1,1,2-Trichloroethane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
1,1-Dichloroethane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
1,1-Dichloroethene	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
1,2-Dichloroethane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
1,2-Dichloropropane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
2-Butanone	ug/L	-	ND(5.0)	-	-	ND(5.0)	-	ND(5.0)
2-Hexanone	ug/L	-	ND(5.0)	-	-	ND(5.0)	-	ND(5.0)
4-Methyl-2-pentanone	ug/L	-	ND(5.0)	-	-	ND(5.0)	-	ND(5.0)
Acetone	ug/L	-	ND(5.0)	-	-	ND(5.0)	-	ND(5.0)
Benzene	ug/L	-	12	-	-	8.2	-	8.4
Bromodichloromethane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Bromoform	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Bromomethane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Carbon disulfide	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Carbon tetrachloride	ug/L	-	ND(1.0)	-	-	ND(1 0)	-	ND(1.0)
Chlorobenzene	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Chlorobromomethane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Chloroethane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Chloroform	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Chloromethane	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
cis-1,2-Dichloroethene	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
cis-1,3-Dichloropropene	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	1.3	-	-	1 2	-	1 3
Methylene chloride	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1 0)
Styrene	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Tetrachloroethene	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1 0)
Toluene	ug/L	-	9.0	-	-	7.1	-	7 7
trans-1,2-Dichloroethene	ug/L	-	ND(1 0)	-	-	ND(1.0)	-	ND(1.0)
trans-1,3-Dichloropropene	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Trichloroethene	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)
Vinyl chloride	ug/L	-	ND(1.0)	-	-	ND(1.0)	-	ND(1 0)
Xylene (total)	ug/L	-	12	-	-	11	-	12
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
1,2-Dichlorobenzene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
1,3-Dichlorobenzene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
1,4-Dichlorobenzene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
2,4,5-Trichlorophenol	ug/L	-	ND(130)	-	-	ND(50)	-	ND(250)
2,4,6-Trichlorophenol	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
2,4-Dichlorophenol	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
2,4-Dimethylphenol	ug/L	-	77	-	-	40	-	46
2,4-Dinitrophenol	ug/L	-	ND(130)	-	-	ND(50)	-	ND(250)
2,4-Dinitrotoluene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
2,6-Dinitrotoluene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
2-Chloronaphthalene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
2-Chlorophenol	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)

GROUNDWATER ANALYTICAL RESULTS - WN-3A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*
Sample ID:		*GW-103000-WP-361*	*GW-110200-WP-398*	*GW-110500-WP-444*	*GW-111300-WP-556*	*GW-111600-WP-603*	*GW-111900-WP-649*	*GW-112700-WP-682*
Sample Date:		*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
2-Methylphenol	ug/L	-	78	-	-	ND(20)	-	14
2-Nitroaniline	ug/L	-	ND(130)	-	-	ND(50)	-	ND(250)
2-Nitrophenol	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
3,3'-Dichlorobenzidine	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
3-Nitroaniline	ug/L	-	ND(130)	-	-	ND(50)	-	ND(250)
4,6-Dinitro-2-methylphenol	ug/L	-	ND(130)	-	-	ND(50)	-	ND(250)
4-Bromophenyl phenyl ether	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
4-Chloro-3-methylphenol	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
4-Chloroaniline	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
4-Chlorophenyl phenyl ether	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
4-Methylphenol	ug/L	-	150	-	-	25	-	20
4-Nitroaniline	ug/L	-	ND(130)	-	-	ND(50)	-	ND(250)
4-Nitrophenol	ug/L	-	ND(130)	-	-	ND(50)	-	ND(250)
Acenaphthene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Acenaphthylene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Anthracene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Benzo(a)anthracene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Benzo(a)pyrene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Benzo(b)fluoranthene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Benzo(g,h,i)perylene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Benzo(k)fluoranthene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
bis(2-Chloroethoxy)methane	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
bis(2-Chloroethyl)ether	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
bis(2-Chloroisopropyl)ether	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
bis(2-Ethylhexyl)phthalate	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Butyl benzylphthalate	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Carbazole	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Chrysene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Dibenz(a,h)anthracene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Dibenzofuran	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Diethyl phthalate	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Dimethyl phthalate	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Di-n-butylphthalate	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Di-n-octyl phthalate	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Fluoranthene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Fluorene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Hexachlorobenzene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Hexachlorobutadiene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Hexachlorocyclopentadiene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Hexachloroethane	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Indeno(1,2,3-cd)pyrene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Isophorone	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Naphthalene	ug/L	-	94	-	-	80	-	74
Nitrobenzene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
N-Nitrosodi-n-propylamine	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
N-Nitrosodiphenylamine	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Pentachlorophenol	ug/L	-	ND(130)	-	-	ND(50)	-	ND(250)
Phenanthrene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Phenol	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)
Pyrene	ug/L	-	ND(50)	-	-	ND(20)	-	ND(100)

TABLE H.1

GROUNDWATER ANALYTICAL RESULTS - WN-3A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*	*WN-3A*
Sample ID:		*GW-103000-WP-361*	*GW-110200-WP-398*	*GW-110500-WP-444*	*GW-111300-WP-556*	*GW-111600-WP-603*	*GW-111900-WP-649*	*GW-112700-WP-682*
Sample Date:		*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*
Parameter	Unit							
Metals								
Arsenic	ug/L	870	1100	1100	950	1200	1100	1100
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	-	-	-	-	450	-	-
Ammonia	mg/L	16	22	18	12	12	13	12
Cyanide (total)	mg/L	-	0.062	-	-	-	-	0.74
Nitrate (as N)	mg/L	-	-	-	-	ND(0.20)	-	-
Phenolics (Total)	mg/L	0.12	0.36	0.45	0.15	0.18	0.14	0.15
Thiocyanate	mg/L	-	170	-	-	550	-	95
Total Suspended Solids (TSS)	mg/L	-	-	-	-	ND(10)	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-3A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3A*	*WN-3A*
Sample ID:		*GW-112700-WP-688*	*GW-121800-WP-710*
Sample Date:		*11/27/2000*	*12/18/2000*
Parameter	*Unit*		
Volatiles			
1,1,1-Trichloroethane	ug/L	ND(1 0)	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(1.0)	ND(1.0)
1,1-Dichloroethane	ug/L	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1 0)	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1.0)	ND(1 0)
2-Butanone	ug/L	ND(5.0)	ND(5 0)
2-Hexanone	ug/L	ND(5.0)	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(5 0)	ND(5.0)
Acetone	ug/L	ND(5.0)	ND(5.0)
Benzene	ug/L	8 5	7.7
Bromodichloromethane	ug/L	ND(1.0)	ND(1.0)
Bromoform	ug/L	ND(1.0)	ND(1.0)
Bromomethane	ug/L	ND(1.0)	ND(1.0)
Carbon disulfide	ug/L	ND(1.0)	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)	ND(1.0)
Chlorobromomethane	ug/L	ND(1 0)	-
Chloroethane	ug/L	ND(1.0)	ND(1.0)
Chloroform	ug/L	ND(1.0)	ND(1.0)
Chloromethane	ug/L	ND(1 0)	ND(1 0)
cis-1,2-Dichloroethene	ug/L	ND(1.0)	ND(1 0)
cis-1,3-Dichloropropene	ug/L	ND(1.0)	ND(1.0)
Dibromochloromethane	ug/L	-	ND(1.0)
Ethylbenzene	ug/L	ND(1.0)	1.0
Methylene chloride	ug/L	ND(1.0)	ND(1.0)
Styrene	ug/L	ND(1.0)	ND(1.0)
Tetrachloroethene	ug/L	ND(1.0)	ND(1.0)
Toluene	ug/L	1.9	8.7
trans-1,2-Dichloroethene	ug/L	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)	ND(1.0)
Trichloroethene	ug/L	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	ND(1.0)	ND(2.0)
Xylene (total)	ug/L	ND(2.0)	9.1
Semi - Volatiles			
1,2,4-Trichlorobenzene	ug/L	ND(10)	ND(10)
1,2-Dichlorobenzene	ug/L	ND(10)	ND(10)
1,3-Dichlorobenzene	ug/L	ND(10)	ND(10)
1,4-Dichlorobenzene	ug/L	ND(10)	ND(10)
2,4,5-Trichlorophenol	ug/L	ND(25)	ND(25)
2,4,6-Trichlorophenol	ug/L	ND(10)	ND(10)
2,4-Dichlorophenol	ug/L	ND(10)	ND(10)
2,4-Dimethylphenol	ug/L	54	56
2,4-Dinitrophenol	ug/L	ND(25)	ND(25)
2,4-Dinitrotoluene	ug/L	ND(10)	ND(10)
2,6-Dinitrotoluene	ug/L	ND(10)	ND(10)
2-Chloronaphthalene	ug/L	ND(10)	ND(10)
2-Chlorophenol	ug/L	ND(10)	ND(10)

TABLE H.1

GROUNDWATER ANALYTICAL RESULTS - WN-3A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3A*	*WN-3A*
Sample ID:		*GW-112700-WP-688*	*GW-121800-WP-710*
Sample Date:		*11/27/2000*	*12/18/2000*
Parameter	*Unit*		
2-Methyl naphthalene	ug/L	ND(10)	ND(10)
2-Methylphenol	ug/L	28	ND(10)
2-Nitroaniline	ug/L	ND(25)	ND(25)
2-Nitrophenol	ug/L	ND(10)	ND(10)
3,3'-Dichlorobenzidine	ug/L	ND(10)	ND(10)
3-Nitroaniline	ug/L	ND(25)	ND(25)
4,6-Dinitro-2-methylphenol	ug/L	ND(25)	ND(25)
4-Bromophenyl phenyl ether	ug/L	ND(10)	ND(10)
4-Chloro-3-methylphenol	ug/L	ND(10)	ND(10)
4-Chloroaniline	ug/L	ND(10)	ND(10)
4-Chlorophenyl phenyl ether	ug/L	ND(10)	ND(10)
4-Methylphenol	ug/L	ND(10)	19
4-Nitroaniline	ug/L	ND(25)	ND(25)
4-Nitrophenol	ug/L	ND(25)	ND(25)
Acenaphthene	ug/L	ND(10)	ND(10)
Acenaphthylene	ug/L	ND(10)	ND(10)
Anthracene	ug/L	ND(10)	ND(10)
Benzo(a)anthracene	ug/L	ND(10)	ND(10)
Benzo(a)pyrene	ug/L	ND(10)	ND(10)
Benzo(b)fluoranthene	ug/L	ND(10)	ND(10)
Benzo(g,h,i)perylene	ug/L	ND(10)	ND(10)
Benzo(k)fluoranthene	ug/L	ND(10)	ND(10)
bis(2-Chloroethoxy)methane	ug/L	ND(10)	ND(10)
bis(2-Chloroethyl)ether	ug/L	ND(10)	ND(10)
bis(2-Chloroisopropyl)ether	ug/L	ND(10)	ND(10)
bis(2-Ethylhexyl)phthalate	ug/L	ND(10)	ND(10)
Butyl benzylphthalate	ug/L	ND(10)	ND(10)
Carbazole	ug/L	ND(10)	ND(10)
Chrysene	ug/L	ND(10)	ND(10)
Dibenz(a,h)anthracene	ug/L	ND(10)	ND(10)
Dibenzofuran	ug/L	ND(10)	ND(10)
Diethyl phthalate	ug/L	ND(10)	ND(10)
Dimethyl phthalate	ug/L	ND(10)	ND(10)
Di-n-butylphthalate	ug/L	ND(10)	ND(10)
Di-n-octyl phthalate	ug/L	ND(10)	ND(10)
Fluoranthene	ug/L	ND(10)	ND(10)
Fluorene	ug/L	ND(10)	ND(10)
Hexachlorobenzene	ug/L	ND(10)	ND(10)
Hexachlorobutadiene	ug/L	ND(10)	ND(10)
Hexachlorocyclopentadiene	ug/L	ND(10)	ND(10)
Hexachloroethane	ug/L	ND(10)	ND(10)
Indeno(1,2,3-cd)pyrene	ug/L	ND(10)	ND(10)
Isophorone	ug/L	ND(10)	ND(10)
Naphthalene	ug/L	ND(10)	86
Nitrobenzene	ug/L	ND(10)	ND(10)
N-Nitrosodi-n-propylamine	ug/L	ND(10)	ND(10)
N-Nitrosodiphenylamine	ug/L	ND(10)	ND(10)
Pentachlorophenol	ug/L	ND(25)	ND(25)
Phenanthrene	ug/L	ND(10)	ND(10)
Phenol	ug/L	ND(10)	ND(10)
Pyrene	ug/L	ND(10)	ND(10)

GROUNDWATER ANALYTICAL RESULTS - WN-3A
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3A*	*WN-3A*
Sample ID:		*GW-112700-WP-688*	*GW-121800-WP-710*
Sample Date:		*11/27/2000*	*12/18/2000*
Parameter	*Unit*		
Metals			
Arsenic	ug/L	750	1100
General Chemistry			
Alkalinity, Total (As CaCO3)	mg/L	-	-
Ammonia	mg/L	7.7	15
Cyanide (total)	mg/L	0 097	0.042
Nitrate (as N)	mg/L	-	-
Phenolics (Total)	mg/L	0.096	0.15
Thiocyanate	mg/L	35	150
Total Suspended Solids (TSS)	mg/L	-	-

GROUNDWATER ANAL\ _AL RESULTS - WN-3B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*
Sample ID:		*GW-100200-WP-005*	*GW-100400-WP-011*	*GW-100500-WP-018*	*GW-100900-WP-035*	*GW-101600-WP-138*	*GW-101900-WP-176*	*GW-102200-WP-216*
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,1,2,2-Tetrachloroethane	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,1,2-Trichloroethane	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,1-Dichloroethane	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,1-Dichloroethene	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,2-Dichloroethane	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
1,2-Dichloropropane	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
2-Butanone	ug/L	ND(10)	-	ND(25)	-	ND(5.0)	ND(5.0)	-
2-Hexanone	ug/L	ND(10)	-	ND(25)	-	ND(5.0)	ND(5.0)	-
4-Methyl-2-pentanone	ug/L	ND(10)	-	ND(25)	-	ND(5.0)	ND(5.0)	-
Acetone	ug/L	19	-	ND(25)	-	ND(5.0)	5.3	-
Benzene	ug/L	190	-	150	-	100	90	-
Bromodichloromethane	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Bromoform	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Bromomethane	ug/L	ND(2.0)	-	ND(10)	-	ND(1.0)	ND(1.0)	-
Carbon disulfide	ug/L	4.8	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Carbon tetrachloride	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Chlorobenzene	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Chlorobromomethane	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Chloroethane	ug/L	ND(2.0)	-	ND(10)	-	ND(1.0)	ND(1.0)	-
Chloroform	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Chloromethane	ug/L	ND(2.0)	-	ND(10)	-	ND(1.0)	ND(1.0)	-
cis-1,2-Dichloroethene	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
cis-1,3-Dichloropropene	ug/L	ND(2.0)	-	ND(5 0)	-	ND(1.0)	ND(1.0)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	3.0	-	ND(5.0)	-	2.6	2.5	-
Methylene chloride	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Styrene	ug/L	3.5	-	ND(5.0)	-	3.3	3.8	-
Tetrachloroethene	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Toluene	ug/L	100	-	84	-	81	81	-
trans-1,2-Dichloroethene	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
trans-1,3-Dichloropropene	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Trichloroethene	ug/L	ND(2.0)	-	ND(5.0)	-	ND(1.0)	ND(1.0)	-
Vinyl chloride	ug/L	ND(2.0)	-	ND(10)	-	ND(1.0)	ND(1.0)	-
Xylene (total)	ug/L	38	-	21	-	34	35	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
1,2-Dichlorobenzene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
1,3-Dichlorobenzene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
1,4-Dichlorobenzene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
2,4,5-Trichlorophenol	ug/L	ND(75)	-	ND(250)	-	ND(500)	ND(500)	-
2,4,6-Trichlorophenol	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
2,4-Dichlorophenol	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
2,4-Dimethylphenol	ug/L	2000	-	1100	-	770	610	-
2,4-Dinitrophenol	ug/L	ND(75)	-	ND(250)	-	ND(500)	ND(500)	-
2,4-Dinitrotoluene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
2,6-Dinitrotoluene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
2-Chloronaphthalene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
2-Chlorophenol	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-

TABLE H.2

GROUNDWATER ANALYTICAL RESULTS - WN-3B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*
Sample ID:		*GW-100200-WP-005*	*GW-100400-WP-011*	*GW-100500-WP-018*	*GW-100900-WP-035*	*GW-101600-WP-138*	*GW-101900-WP-176*	*GW-102200-WP-216*
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
2-Methylphenol	ug/L	3100	-	1800	-	690	570	-
2-Nitroaniline	ug/L	ND(75)	-	ND(250)	-	ND(500)	ND(500)	-
2-Nitrophenol	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
3,3'-Dichlorobenzidine	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
3-Nitroaniline	ug/L	ND(75)	-	ND(250)	-	ND(500)	ND(500)	-
4,6-Dinitro-2-methylphenol	ug/L	ND(75)	-	ND(250)	-	ND(500)	ND(500)	-
4-Bromophenyl phenyl ether	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
4-Chloro-3-methylphenol	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
4-Chloroaniline	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
4-Chlorophenyl phenyl ether	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
4-Methylphenol	ug/L	7400	-	3800	-	1500	1200	-
4-Nitroaniline	ug/L	ND(75)	-	ND(250)	-	ND(500)	ND(500)	-
4-Nitrophenol	ug/L	ND(75)	-	ND(250)	-	ND(500)	ND(500)	-
Acenaphthene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Acenaphthylene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Anthracene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Benzo(a)anthracene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Benzo(a)pyrene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Benzo(b)fluoranthene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Benzo(g,h,i)perylene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Benzo(k)fluoranthene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
bis(2-Chloroethoxy)methane	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
bis(2-Chloroethyl)ether	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
bis(2-Chloroisopropyl)ether	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Butyl benzylphthalate	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Carbazole	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Chrysene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Dibenz(a,h)anthracene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Dibenzofuran	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Diethyl phthalate	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Dimethyl phthalate	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Di-n-butylphthalate	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Di-n-octyl phthalate	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Fluoranthene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Fluorene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Hexachlorobenzene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Hexachlorobutadiene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Hexachlorocyclopentadiene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Hexachloroethane	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Isophorone	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Naphthalene	ug/L	590	-	380	-	300	330	-
Nitrobenzene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
N-Nitrosodi-n-propylamine	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
N-Nitrosodiphenylamine	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Pentachlorophenol	ug/L	ND(75)	-	ND(250)	-	ND(500)	ND(500)	-
Phenanthrene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-
Phenol	ug/L	8000	-	3900	-	740	620	-
Pyrene	ug/L	ND(30)	-	ND(100)	-	ND(200)	ND(200)	-

GROUNDWATER ANAL .AL RESULTS - WN-3B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*
Sample ID:		*GW-100200-WP-005*	*GW-100400-WP-011*	*GW-100500-WP-018*	*GW-100900-WP-035*	*GW-101600-WP-138*	*GW-101900-WP-176*	*GW-102200-WP-216*
Sample Date:		10/2/2000	10/4/2000	10/5/2000	10/9/2000	10/16/2000	10/19/2000	10/22/2000
Parameter	*Unit*							
Metals								
Arsenic	ug/L	1000	820	710	360	350	290	290
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	-	-	-	-	-	-	-
Ammonia	mg/L	-	150	130	120	83	90	73
Cyanide (total)	mg/L	0.11	-	0.089	-	0.058	0.087	-
Nitrate (as N)	mg/L	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	2400	110	23	7.4	4.0 J	3.9	3.2
Thiocyanate	mg/L	380	-	200	-	30	170	-
Total Suspended Solids (TSS)	mg/L	-	-	-	-	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-3B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*
Sample ID:		*GW-110200-WP-399*	*GW-110500-WP-445*	*GW-111300-WP-557*	*GW-111600-WP-604*	*GW-111900-WP-650*	*GW-112700-WP-683*	*GW-121800-WP-711*
Sample Date:		*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
1,1,2-Trichloroethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
1,1-Dichloroethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
1,1-Dichloroethene	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
1,2-Dichloroethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
1,2-Dichloropropane	ug/L	ND(1 0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
2-Butanone	ug/L	ND(5.0)	-	-	ND(5.0)	-	ND(5.0)	ND(5.0)
2-Hexanone	ug/L	ND(5.0)	-	-	ND(5.0)	-	ND(5.0)	ND(5.0)
4-Methyl-2-pentanone	ug/L	ND(5.0)	-	-	ND(5.0)	-	ND(5.0)	ND(5.0)
Acetone	ug/L	ND(5.0)	-	-	ND(5.0)	-	ND(5.0)	ND(5.0)
Benzene	ug/L	75	-	-	71	-	70	68
Bromodichloromethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
Bromoform	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
Bromomethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1 0)
Carbon disulfide	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
Carbon tetrachloride	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
Chlorobenzene	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1 0)
Chlorobromomethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	-
Chloroethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
Chloroform	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
Chloromethane	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
cis-1,2-Dichloroethene	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
cis-1,3-Dichloropropene	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	ND(1.0)
Ethylbenzene	ug/L	2.5	-	-	2.3	-	2.3	1.7
Methylene chloride	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
Styrene	ug/L	4.1	-	-	3.7	-	3.9	2.6
Tetrachloroethene	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
Toluene	ug/L	81	-	-	66	-	71	67
trans-1,2-Dichloroethene	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
trans-1,3-Dichloropropene	ug/L	ND(1.0)	-	-	ND(1 0)	-	ND(1.0)	ND(1.0)
Trichloroethene	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(1.0)
Vinyl chloride	ug/L	ND(1.0)	-	-	ND(1.0)	-	ND(1.0)	ND(2.0)
Xylene (total)	ug/L	36	-	-	32	-	34	25
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
1,2-Dichlorobenzene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
1,3-Dichlorobenzene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
1,4-Dichlorobenzene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
2,4,5-Trichlorophenol	ug/L	ND(250)	-	-	ND(130)	-	ND(130)	ND(100)
2,4,6-Trichlorophenol	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
2,4-Dichlorophenol	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
2,4-Dimethylphenol	ug/L	610	-	-	490	-	410	630
2,4-Dinitrophenol	ug/L	ND(250)	-	-	ND(130)	-	ND(130)	ND(100)
2,4-Dinitrotoluene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
2,6-Dinitrotoluene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
2-Chloronaphthalene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
2-Chlorophenol	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)

GROUNDWATER ANALYTICAL RESULTS - WN-3B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*
Sample ID:		*GW-110200-WP-399*	*GW-110500-WP-445*	*GW-111300-WP-557*	*GW-111600-WP-604*	*GW-111900-WP-650*	*GW-112700-WP-683*	*GW-121800-WP-711*
Sample Date:		*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
2-Methylphenol	ug/L	390	-	-	300	-	180	210
2-Nitroaniline	ug/L	ND(250)	-	-	ND(130)	-	ND(130)	ND(100)
2-Nitrophenol	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
3,3'-Dichlorobenzidine	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
3-Nitroaniline	ug/L	ND(250)	-	-	ND(130)	-	ND(130)	ND(100)
4,6-Dinitro-2-methylphenol	ug/L	ND(250)	-	-	ND(130)	-	ND(130)	ND(100)
4-Bromophenyl phenyl ether	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
4-Chloro-3-methylphenol	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
4-Chloroaniline	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
4-Chlorophenyl phenyl ether	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
4-Methylphenol	ug/L	780	-	-	500	-	310	280
4-Nitroaniline	ug/L	ND(250)	-	-	ND(130)	-	ND(130)	ND(100)
4-Nitrophenol	ug/L	ND(250)	-	-	ND(130)	-	ND(130)	ND(100)
Acenaphthene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Acenaphthylene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Anthracene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Benzo(a)anthracene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Benzo(a)pyrene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Benzo(b)fluoranthene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Benzo(g,h,i)perylene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Benzo(k)fluoranthene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
bis(2-Chloroethoxy)methane	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
bis(2-Chloroethyl)ether	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
bis(2-Chloroisopropyl)ether	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
bis(2-Ethylhexyl)phthalate	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Butyl benzylphthalate	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Carbazole	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Chrysene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Dibenz(a,h)anthracene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Dibenzofuran	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Diethyl phthalate	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Dimethyl phthalate	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Di-n-butylphthalate	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Di-n-octyl phthalate	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Fluoranthene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Fluorene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Hexachlorobenzene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Hexachlorobutadiene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Hexachlorocyclopentadiene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Hexachloroethane	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Indeno(1,2,3-cd)pyrene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Isophorone	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Naphthalene	ug/L	360	-	-	320	-	250	390
Nitrobenzene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
N-Nitrosodi-n-propylamine	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
N-Nitrosodiphenylamine	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Pentachlorophenol	ug/L	ND(250)	-	-	ND(130)	-	ND(130)	ND(100)
Phenanthrene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)
Phenol	ug/L	220	-	-	ND(50)	-	ND(50)	ND(40)
Pyrene	ug/L	ND(100)	-	-	ND(50)	-	ND(50)	ND(40)

TABLE H.2

GROUNDWATER ANALYTICAL RESULTS - WN-3B
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*	*WN-3B*
Sample ID:		*GW-110200-WP-399*	*GW-110500-WP-445*	*GW-111300-WP-557*	*GW-111600-WP-604*	*GW-111900-WP-650*	*GW-112700-WP-683*	*GW-121800-WP-711*
Sample Date:		*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*	*12/18/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	290	300	280	280	310	210	230
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	-	-	-	660	-	-	-
Ammonia	mg/L	91	86	76	67	70	72	87
Cyanide (total)	mg/L	ND(0.010)	-	-	-	-	0.076	0.044
Nitrate (as N)	mg/L	-	-	-	ND(0.20)	-	-	-
Phenolics (Total)	mg/L	2.3	2.2	1.4	1.2	1.3	1.1	2.1
Thiocyanate	mg/L	24	-	-	440	-	200	30
Total Suspended Solids (TSS)	mg/L	-	-	-	ND(10)	-	-	-

GROUNDWATER ANAL. .AL RESULTS - WN-3C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*
Sample ID:		*GW-100200-WP-004*	*GW-100400-WP-010*	*GW-100500-WP-017*	*GW-100900-WP-034*	*GW-101600-WP-139*	*GW-101900-WP-177*	*GW-102200-WP-217*
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
1,1,2,2-Tetrachloroethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
1,1,2-Trichloroethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
1,1-Dichloroethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
1,1-Dichloroethene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
1,2-Dichloroethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
1,2-Dichloropropane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
2-Butanone	ug/L	ND(25)	-	ND(25)	-	ND(10)	ND(50)	-
2-Hexanone	ug/L	ND(25)	-	ND(25)	-	ND(10)	ND(50)	-
4-Methyl-2-pentanone	ug/L	ND(25)	-	ND(25)	-	ND(10)	ND(50)	-
Acetone	ug/L	84	-	53	-	51	59	-
Benzene	ug/L	480	-	430	-	270	460	-
Bromodichloromethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Bromoform	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Bromomethane	ug/L	ND(5.0)	-	ND(10)	-	ND(2.0)	ND(10)	-
Carbon disulfide	ug/L	29	-	27	-	3.2	ND(10)	-
Carbon tetrachloride	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Chlorobenzene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Chlorobromomethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Chloroethane	ug/L	ND(5 0)	-	ND(10)	-	ND(2.0)	ND(10)	-
Chloroform	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Chloromethane	ug/L	ND(5.0)	-	ND(10)	-	ND(2.0)	ND(10)	-
cis-1,2-Dichloroethene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
cis-1,3-Dichloropropene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(5.0)	-	ND(5.0)	-	2.0	ND(10)	-
Methylene chloride	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Styrene	ug/L	8.5	-	6.0	-	8.0	15	-
Tetrachloroethene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Toluene	ug/L	200	-	190	-	140	250	-
trans-1,2-Dichloroethene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
trans-1,3-Dichloropropene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Trichloroethene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(2.0)	ND(10)	-
Vinyl chloride	ug/L	ND(5.0)	-	ND(10)	-	ND(2.0)	ND(10)	-
Xylene (total)	ug/L	52	-	34	-	44	72	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
1,2-Dichlorobenzene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
1,3-Dichlorobenzene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
1,4-Dichlorobenzene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
2,4,5-Trichlorophenol	ug/L	ND(250)	-	ND(250)	-	ND(2500)	ND(5000)	-
2,4,6-Trichlorophenol	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
2,4-Dichlorophenol	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
2,4-Dimethylphenol	ug/L	7500	-	4800	-	3000	2400	-
2,4-Dinitrophenol	ug/L	ND(250)	-	ND(250)	-	ND(2500)	ND(5000)	-
2,4-Dinitrotoluene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
2,6-Dinitrotoluene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
2-Chloronaphthalene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
2-Chlorophenol	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-

TABLE H.3

GROUNDWATER ANALYTICAL RESULTS - WN-3C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*
Sample ID:		*GW-100200-WP-004*	*GW-100400-WP-010*	*GW-100500-WP-017*	*GW-100900-WP-034*	*GW-101600-WP-139*	*GW-101900-WP-177*	*GW-102200-WP-217*
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
2-Methylphenol	ug/L	21000	-	8700	-	4500	2500	-
2-Nitroaniline	ug/L	ND(250)	-	ND(250)	-	ND(2500)	ND(5000)	-
2-Nitrophenol	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
3,3'-Dichlorobenzidine	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
3-Nitroaniline	ug/L	ND(250)	-	ND(250)	-	ND(2500)	ND(5000)	-
4,6-Dinitro-2-methylphenol	ug/L	ND(250)	-	ND(250)	-	ND(2500)	ND(5000)	-
4-Bromophenyl phenyl ether	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
4-Chloro-3-methylphenol	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
4-Chloroaniline	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
4-Chlorophenyl phenyl ether	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
4-Methylphenol	ug/L	55000	-	24000	-	14000	7300	-
4-Nitroaniline	ug/L	ND(250)	-	ND(250)	-	ND(2500)	ND(5000)	-
4-Nitrophenol	ug/L	ND(250)	-	ND(250)	-	ND(2500)	ND(5000)	-
Acenaphthene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Acenaphthylene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Anthracene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Benzo(a)anthracene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Benzo(a)pyrene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Benzo(b)fluoranthene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Benzo(g,h,i)perylene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Benzo(k)fluoranthene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
bis(2-Chloroethoxy)methane	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
bis(2-Chloroethyl)ether	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
bis(2-Chloroisopropyl)ether	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Butyl benzylphthalate	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Carbazole	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Chrysene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Dibenz(a,h)anthracene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Dibenzofuran	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Diethyl phthalate	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Dimethyl phthalate	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Di-n-butylphthalate	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Di-n-octyl phthalate	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Fluoranthene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Fluorene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Hexachlorobenzene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Hexachlorobutadiene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Hexachlorocyclopentadiene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Hexachloroethane	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Isophorone	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Naphthalene	ug/L	1500	-	2300	-	ND(1000)	ND(2000)	-
Nitrobenzene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
N-Nitrosodi-n-propylamine	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
N-Nitrosodiphenylamine	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Pentachlorophenol	ug/L	ND(250)	-	ND(250)	-	ND(2500)	ND(5000)	-
Phenanthrene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-
Phenol	ug/L	76000	-	30000	-	14000	6400	-
Pyrene	ug/L	ND(100)	-	ND(100)	-	ND(1000)	ND(2000)	-

GROUNDWATER ANAL. .AL RESULTS - WN-3C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*
Sample ID:		*GW-100200-WP-004*	*GW-100400-WP-010*	*GW-100500-WP-017*	*GW-100900-WP-034*	*GW-101600-WP-139*	*GW-101900-WP-177*	*GW-102200-WP-217*
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	340	1300	1600	1300	1200	1200	1100
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	-	-	-	-	-	-	-
Ammonia	mg/L	-	470	720	410	370	420	260
Cyanide (total)	mg/L	0.22	-	0.020	-	0.20	0.014	-
Nitrate (as N)	mg/L	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	3200	1200	110	58	68 J	4.8	20
Thiocyanate	mg/L	390	-	95	-	3000	1800	-
Total Suspended Solids (TSS)	mg/L	-	-	-	-	-	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-3C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*
Sample ID:		*GW-103000-WP-363*	*GW-110200-WP-400*	*GW-110500-WP-446*	*GW-111300-WP-558*	*GW-111600-WP-605*	*GW-111900-WP-651*	*GW-112700-WP-684*
Sample Date:		*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
1,1,2,2-Tetrachloroethane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
1,1,2-Trichloroethane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
1,1-Dichloroethane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
1,1-Dichloroethene	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
1,2-Dichloroethane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
1,2-Dichloropropane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
2-Butanone	ug/L	-	ND(50)	-	-	ND(10)	-	ND(25)
2-Hexanone	ug/L	-	ND(50)	-	-	ND(10)	-	ND(25)
4-Methyl-2-pentanone	ug/L	-	ND(50)	-	-	ND(10)	-	ND(25)
Acetone	ug/L	-	ND(50)	-	-	18	-	39
Benzene	ug/L	-	210	-	-	230	-	280
Bromodichloromethane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Bromoform	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Bromomethane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Carbon disulfide	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Carbon tetrachloride	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Chlorobenzene	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Chlorobromomethane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Chloroethane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Chloroform	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Chloromethane	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
cis-1,2-Dichloroethene	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
cis-1,3-Dichloropropene	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Methylene chloride	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Styrene	ug/L	-	ND(10)	-	-	7.3	-	7.7
Tetrachloroethene	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Toluene	ug/L	-	120	-	-	120	-	140
trans-1,2-Dichloroethene	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
trans-1,3-Dichloropropene	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Trichloroethene	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Vinyl chloride	ug/L	-	ND(10)	-	-	ND(2.0)	-	ND(5.0)
Xylene (total)	ug/L	-	36	-	-	35	-	38
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
1,2-Dichlorobenzene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
1,3-Dichlorobenzene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
1,4-Dichlorobenzene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
2,4,5-Trichlorophenol	ug/L	-	ND(5000)	-	-	ND(1300)	-	ND(5000)
2,4,6-Trichlorophenol	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
2,4-Dichlorophenol	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
2,4-Dimethylphenol	ug/L	-	2100	-	-	2100	-	2100
2,4-Dinitrophenol	ug/L	-	ND(5000)	-	-	ND(1300)	-	ND(5000)
2,4-Dinitrotoluene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
2,6-Dinitrotoluene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
2-Chloronaphthalene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
2-Chlorophenol	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)

GROUNDWATER ANAL. .CAL RESULTS - WN-3C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*
Sample ID:		*GW-103000-WP-363*	*GW-110200-WP-400*	*GW-110500-WP-446*	*GW-111300-WP-558*	*GW-111600-WP-605*	*GW-111900-WP-651*	*GW-112700-WP-684*
Sample Date:		*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
2-Methylphenol	ug/L	-	2400	-	-	2100	-	2200
2-Nitroaniline	ug/L	-	ND(5000)	-	-	ND(1300)	-	ND(5000)
2-Nitrophenol	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
3,3'-Dichlorobenzidine	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
3-Nitroaniline	ug/L	-	ND(5000)	-	-	ND(1300)	-	ND(5000)
4,6-Dinitro-2-methylphenol	ug/L	-	ND(5000)	-	-	ND(1300)	-	ND(5000)
4-Bromophenyl phenyl ether	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
4-Chloro-3-methylphenol	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
4-Chloroaniline	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
4-Chlorophenyl phenyl ether	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
4-Methylphenol	ug/L	-	6600	-	-	4800	-	7200
4-Nitroaniline	ug/L	-	ND(5000)	-	-	ND(1300)	-	ND(5000)
4-Nitrophenol	ug/L	-	ND(5000)	-	-	ND(1300)	-	ND(5000)
Acenaphthene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Acenaphthylene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Anthracene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Benzo(a)anthracene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Benzo(a)pyrene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Benzo(b)fluoranthene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Benzo(g,h,i)perylene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Benzo(k)fluoranthene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
bis(2-Chloroethoxy)methane	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
bis(2-Chloroethyl)ether	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
bis(2-Chloroisopropyl)ether	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
bis(2-Ethylhexyl)phthalate	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Butyl benzylphthalate	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Carbazole	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Chrysene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Dibenz(a,h)anthracene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Dibenzofuran	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Diethyl phthalate	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Dimethyl phthalate	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Di-n-butylphthalate	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Di-n-octyl phthalate	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Fluoranthene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Fluorene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Hexachlorobenzene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Hexachlorobutadiene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Hexachlorocyclopentadiene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Hexachloroethane	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Indeno(1,2,3-cd)pyrene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Isophorone	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Naphthalene	ug/L	-	ND(2000)	-	-	940	-	ND(2000)
Nitrobenzene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
N-Nitrosodi-n-propylamine	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
N-Nitrosodiphenylamine	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Pentachlorophenol	ug/L	-	ND(5000)	-	-	ND(1300)	-	ND(5000)
Phenanthrene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)
Phenol	ug/L	-	4700	-	-	3300	-	5800
Pyrene	ug/L	-	ND(2000)	-	-	ND(500)	-	ND(2000)

TABLE H.3

GROUNDWATER ANALYTICAL RESULTS - WN-3C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*	*WN-3C*
Sample ID:		*GW-103000-WP-363*	*GW-110200-WP-400*	*GW-110500-WP-446*	*GW-111300-WP-558*	*GW-111600-WP-605*	*GW-111900-WP-651*	*GW-112700-WP-684*
Sample Date:		10/30/2000	11/2/2000	11/5/2000	11/13/2000	11/16/2000	11/19/2000	11/27/2000
Parameter	*Unit*							
Metals								
Arsenic	ug/L	1200	1100	490	1000	1000	910	950
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	-	-	-	-	1000	-	-
Ammonia	mg/L	330	360	380	370	350	290	330
Cyanide (total)	mg/L	-	0.010	-	-	-	-	0.039
Nitrate (as N)	mg/L	-	-	-	-	ND(0.20)	-	-
Phenolics (Total)	mg/L	29	22	17	27	16	2.4	28
Thiocyanate	mg/L	-	220	-	-	860	-	250
Total Suspended Solids (TSS)	mg/L	-	-	-	-	ND(10)	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-3C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3C*
Sample ID:		*GW-121800-WP-709*
Sample Date:		*12/18/2000*
Parameter	***Unit***	
Volatiles		
1,1,1-Trichloroethane	ug/L	ND(2.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(2.0)
1,1,2-Trichloroethane	ug/L	ND(2.0)
1,1-Dichloroethane	ug/L	ND(2.0)
1,1-Dichloroethene	ug/L	ND(2.0)
1,2-Dichloroethane	ug/L	ND(2.0)
1,2-Dichloropropane	ug/L	ND(2.0)
2-Butanone	ug/L	ND(10)
2-Hexanone	ug/L	ND(10)
4-Methyl-2-pentanone	ug/L	ND(10)
Acetone	ug/L	47
Benzene	ug/L	280
Bromodichloromethane	ug/L	ND(2.0)
Bromoform	ug/L	ND(2.0)
Bromomethane	ug/L	ND(2.0)
Carbon disulfide	ug/L	ND(2.0)
Carbon tetrachloride	ug/L	ND(2.0)
Chlorobenzene	ug/L	ND(2.0)
Chlorobromomethane	ug/L	-
Chloroethane	ug/L	ND(2.0)
Chloroform	ug/L	ND(2.0)
Chloromethane	ug/L	3.3
cis-1,2-Dichloroethene	ug/L	ND(2.0)
cis-1,3-Dichloropropene	ug/L	ND(2.0)
Dibromochloromethane	ug/L	ND(2.0)
Ethylbenzene	ug/L	ND(2.0)
Methylene chloride	ug/L	ND(2.0)
Styrene	ug/L	5.7
Tetrachloroethene	ug/L	ND(2.0)
Toluene	ug/L	150
trans-1,2-Dichloroethene	ug/L	ND(2.0)
trans-1,3-Dichloropropene	ug/L	ND(2.0) UJ
Trichloroethene	ug/L	ND(2.0)
Vinyl chloride	ug/L	ND(4.0)
Xylene (total)	ug/L	30
Semi - Volatiles		
1,2,4-Trichlorobenzene	ug/L	ND(1000)
1,2-Dichlorobenzene	ug/L	ND(1000)
1,3-Dichlorobenzene	ug/L	ND(1000)
1,4-Dichlorobenzene	ug/L	ND(1000)
2,4,5-Trichlorophenol	ug/L	ND(2500)
2,4,6-Trichlorophenol	ug/L	ND(1000)
2,4-Dichlorophenol	ug/L	ND(1000)
2,4-Dimethylphenol	ug/L	3600
2,4-Dinitrophenol	ug/L	ND(2500)
2,4-Dinitrotoluene	ug/L	ND(1000)
2,6-Dinitrotoluene	ug/L	ND(1000)
2-Chloronaphthalene	ug/L	ND(1000)
2-Chlorophenol	ug/L	ND(1000)

TABLE H.3

GROUNDWATER ANALYTICAL RESULTS - WN-3C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3C*
Sample ID:		*GW-121800-WP-709*
Sample Date:		*12/18/2000*
Parameter	***Unit***	
2-Methyl naphthalene	ug/L	ND(1000)
2-Methylphenol	ug/L	4000
2-Nitroaniline	ug/L	ND(2500)
2-Nitrophenol	ug/L	ND(1000)
3,3'-Dichlorobenzidine	ug/L	ND(1000)
3-Nitroaniline	ug/L	ND(2500)
4,6-Dinitro-2-methylphenol	ug/L	ND(2500)
4-Bromophenyl phenyl ether	ug/L	ND(1000)
4-Chloro-3-methylphenol	ug/L	ND(1000)
4-Chloroaniline	ug/L	ND(1000)
4-Chlorophenyl phenyl ether	ug/L	ND(1000)
4-Methylphenol	ug/L	11000
4-Nitroaniline	ug/L	ND(2500)
4-Nitrophenol	ug/L	ND(2500)
Acenaphthene	ug/L	ND(1000)
Acenaphthylene	ug/L	ND(1000)
Anthracene	ug/L	ND(1000)
Benzo(a)anthracene	ug/L	ND(1000)
Benzo(a)pyrene	ug/L	ND(1000)
Benzo(b)fluoranthene	ug/L	ND(1000)
Benzo(g,h,i)perylene	ug/L	ND(1000)
Benzo(k)fluoranthene	ug/L	ND(1000)
bis(2-Chloroethoxy)methane	ug/L	ND(1000)
bis(2-Chloroethyl)ether	ug/L	ND(1000)
bis(2-Chloroisopropyl)ether	ug/L	ND(1000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(1000)
Butyl benzylphthalate	ug/L	ND(1000)
Carbazole	ug/L	ND(1000)
Chrysene	ug/L	ND(1000)
Dibenz(a,h)anthracene	ug/L	ND(1000)
Dibenzofuran	ug/L	ND(1000)
Diethyl phthalate	ug/L	ND(1000)
Dimethyl phthalate	ug/L	ND(1000)
Di-n-butylphthalate	ug/L	ND(1000)
Di-n-octyl phthalate	ug/L	ND(1000)
Fluoranthene	ug/L	ND(1000)
Fluorene	ug/L	ND(1000)
Hexachlorobenzene	ug/L	ND(1000)
Hexachlorobutadiene	ug/L	ND(1000)
Hexachlorocyclopentadiene	ug/L	ND(1000)
Hexachloroethane	ug/L	ND(1000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(1000)
Isophorone	ug/L	ND(1000)
Naphthalene	ug/L	ND(1000)
Nitrobenzene	ug/L	ND(1000)
N-Nitrosodi-n-propylamine	ug/L	ND(1000)
N-Nitrosodiphenylamine	ug/L	ND(1000)
Pentachlorophenol	ug/L	ND(2500)
Phenanthrene	ug/L	ND(1000)
Phenol	ug/L	11000
Pyrene	ug/L	ND(1000)

GROUNDWATER ANALYTICAL RESULTS - WN-3C
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3C*
Sample ID:		*GW-121800-WP-709*
Sample Date:		*12/18/2000*
Parameter	*Unit*	
Metals		
Arsenic	ug/L	1000
General Chemistry		
Alkalinity, Total (As CaCO3)	mg/L	-
Ammonia	mg/L	340
Cyanide (total)	mg/L	0.12
Nitrate (as N)	mg/L	-
Phenolics (Total)	mg/L	41
Thiocyanate	mg/L	250
Total Suspended Solids (TSS)	mg/L	-

GROUNDWATER ANALYTICAL RESULTS - WN-3D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*
Sample ID:		*GW-100200-WP-003*	*GW-100400-WP-009*	*GW-100500-WP-016*	*GW-100900-WP-033*	*GW-101600-WP-140*	*GW-101900-WP-178*	*GW-102200-WP-218*
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
1,1,2,2-Tetrachloroethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
1,1,2-Trichloroethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
1,1-Dichloroethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
1,1-Dichloroethene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
1,2-Dichloroethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
1,2-Dichloropropane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
2-Butanone	ug/L	47	-	45	-	ND(50)	210	-
2-Hexanone	ug/L	ND(25)	-	ND(25)	-	ND(50)	ND(50)	-
4-Methyl-2-pentanone	ug/L	ND(25)	-	ND(25)	-	ND(50)	ND(50)	-
Acetone	ug/L	260	-	350	-	280	1400	-
Benzene	ug/L	870	-	1000	-	770	840	-
Bromodichloromethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Bromoform	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Bromomethane	ug/L	ND(5.0)	-	ND(10)	-	ND(10)	ND(10)	-
Carbon disulfide	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Carbon tetrachloride	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Chlorobenzene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Chlorobromomethane	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Chloroethane	ug/L	ND(5.0)	-	ND(10)	-	ND(10)	ND(10)	-
Chloroform	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Chloromethane	ug/L	ND(5.0)	-	ND(10)	-	ND(10)	ND(10)	-
cis-1,2-Dichloroethene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
cis-1,3-Dichloropropene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	11	-
Methylene chloride	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Styrene	ug/L	16	-	18	-	22	80	-
Tetrachloroethene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Toluene	ug/L	300	-	410	-	330	1100	-
trans-1,2-Dichloroethene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
trans-1,3-Dichloropropene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Trichloroethene	ug/L	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)	-
Vinyl chloride	ug/L	ND(5.0)	-	ND(10)	-	ND(10)	ND(10)	-
Xylene (total)	ug/L	79	-	76	-	88	310	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
1,2-Dichlorobenzene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
1,3-Dichlorobenzene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
1,4-Dichlorobenzene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
2,4,5-Trichlorophenol	ug/L	ND(500)	-	ND(500)	-	ND(38000)	ND(13000)	-
2,4,6-Trichlorophenol	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
2,4-Dichlorophenol	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
2,4-Dimethylphenol	ug/L	ND(50000)	-	17000	-	16000	17000	-
2,4-Dinitrophenol	ug/L	ND(500)	-	ND(500)	-	ND(38000)	ND(13000)	-
2,4-Dinitrotoluene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
2,6-Dinitrotoluene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
2-Chloronaphthalene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
2-Chlorophenol	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-

TABLE H.4

GROUNDWATER ANALYTICAL RESULTS - WN-3D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*
Sample ID:		*GW-100200-WP-003*	*GW-100400-WP-009*	*GW-100500-WP-016*	*GW-100900-WP-033*	*GW-101600-WP-140*	*GW-101900-WP-178*	*GW-102200-WP-218*
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
2-Methylphenol	ug/L	60000	-	51000	-	39000	40000	-
2-Nitroaniline	ug/L	ND(500)	-	ND(500)	-	ND(38000)	ND(13000)	-
2-Nitrophenol	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
3,3'-Dichlorobenzidine	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
3-Nitroaniline	ug/L	ND(500)	-	ND(500)	-	ND(38000)	ND(13000)	-
4,6-Dinitro-2-methylphenol	ug/L	ND(500)	-	ND(500)	-	ND(38000)	ND(13000)	-
4-Bromophenyl phenyl ether	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
4-Chloro-3-methylphenol	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
4-Chloroaniline	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
4-Chlorophenyl phenyl ether	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
4-Methylphenol	ug/L	190000	-	150000	-	140000	150000	-
4-Nitroaniline	ug/L	ND(500)	-	ND(500)	-	ND(38000)	ND(13000)	-
4-Nitrophenol	ug/L	ND(500)	-	ND(500)	-	ND(38000)	ND(13000)	-
Acenaphthene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Acenaphthylene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Anthracene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Benzo(a)anthracene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Benzo(a)pyrene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Benzo(b)fluoranthene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Benzo(g,h,i)perylene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Benzo(k)fluoranthene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
bis(2-Chloroethoxy)methane	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
bis(2-Chloroethyl)ether	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
bis(2-Chloroisopropyl)ether	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
bis(2-Ethylhexyl)phthalate	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Butyl benzylphthalate	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Carbazole	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Chrysene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Dibenz(a,h)anthracene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Dibenzofuran	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Diethyl phthalate	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Dimethyl phthalate	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Di-n-butylphthalate	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Di-n-octyl phthalate	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Fluoranthene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Fluorene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Hexachlorobenzene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Hexachlorobutadiene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Hexachlorocyclopentadiene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Hexachloroethane	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Indeno(1,2,3-cd)pyrene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Isophorone	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Naphthalene	ug/L	1900	-	6900	-	ND(15000)	ND(5000)	-
Nitrobenzene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
N-Nitrosodi-n-propylamine	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
N-Nitrosodiphenylamine	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Pentachlorophenol	ug/L	ND(500)	-	ND(500)	-	ND(38000)	ND(13000)	-
Phenanthrene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-
Phenol	ug/L	280000	-	220000	-	210000	210000	-
Pyrene	ug/L	ND(200)	-	ND(200)	-	ND(15000)	ND(5000)	-

GROUNDWATER ANAL. AL RESULTS - WN-3D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*
Sample ID:		GW-100200-WP-003	GW-100400-WP-009	GW-100500-WP-016	GW-100900-WP-033	GW-101600-WP-140	GW-101900-WP-178	GW-102200-WP-218
Sample Date:		*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*	*10/22/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	2400	-	4000	3500	2400	2900	3000
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	-	-	-	-	-	-	-
Ammonia	mg/L	-	1200	1100	1800	1700	1400	1100
Cyanide (total)	mg/L	0.47	-	0.65	-	0.61	0.54	-
Nitrate (as N)	mg/L	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	1400	1400	1200	1000	520 J	85	940
Thiocyanate	mg/L	460	-	620	-	5800	5700	-
Total Suspended Solids (TSS)	mg/L	-	-	-	-	-	-	-

TABLE H.4

GROUNDWATER ANALYTICAL RESULTS - WN-3D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*
Sample ID:		*GW-103000-WP-364*	*GW-110200-WP-401*	*GW-110500-WP-447*	*GW-111300-WP-559*	*GW-111600-WP-606*	*GW-111900-WP-652*	*GW-112700-WP-685*
Sample Date:		*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
1,1,2,2-Tetrachloroethane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
1,1,2-Trichloroethane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
1,1-Dichloroethane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
1,1-Dichloroethene	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
1,2-Dichloroethane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
1,2-Dichloropropane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
2-Butanone	ug/L	-	ND(50)	-	-	57	-	ND(50)
2-Hexanone	ug/L	-	ND(50)	-	-	ND(25)	-	ND(50)
4-Methyl-2-pentanone	ug/L	-	ND(50)	-	-	ND(25)	-	ND(50)
Acetone	ug/L	-	470	-	-	380	-	360
Benzene	ug/L	-	720	-	-	840	-	830
Bromodichloromethane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Bromoform	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Bromomethane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Carbon disulfide	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Carbon tetrachloride	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Chlorobenzene	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Chlorobromomethane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Chloroethane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Chloroform	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Chloromethane	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
cis-1,2-Dichloroethene	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
cis-1,3-Dichloropropene	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Methylene chloride	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Styrene	ug/L	-	21	-	-	22	-	20
Tetrachloroethene	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Toluene	ug/L	-	340	-	-	340	-	340
trans-1,2-Dichloroethene	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
trans-1,3-Dichloropropene	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Trichloroethene	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Vinyl chloride	ug/L	-	ND(10)	-	-	ND(5.0)	-	ND(10)
Xylene (total)	ug/L	-	81	-	-	82	-	75
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
1,2-Dichlorobenzene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
1,3-Dichlorobenzene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
1,4-Dichlorobenzene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
2,4,5-Trichlorophenol	ug/L	-	ND(13000)	-	-	ND(130000)	-	ND(13000)
2,4,6-Trichlorophenol	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
2,4-Dichlorophenol	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
2,4-Dimethylphenol	ug/L	-	18000	-	-	ND(50000)	-	17000
2,4-Dinitrophenol	ug/L	-	ND(13000)	-	-	ND(130000)	-	ND(13000)
2,4-Dinitrotoluene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
2,6-Dinitrotoluene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
2-Chloronaphthalene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
2-Chlorophenol	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)

GROUNDWATER ANAL. .AL RESULTS - WN-3D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*
Sample ID:		*GW-103000-WP-364*	*GW-110200-WP-401*	*GW-110500-WP-447*	*GW-111300-WP-559*	*GW-111600-WP-606*	*GW-111900-WP-652*	*GW-112700-WP-685*
Sample Date:		*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
2-Methylphenol	ug/L	-	51000	-	-	ND(50000)	-	41000
2-Nitroaniline	ug/L	-	ND(13000)	-	-	ND(130000)	-	ND(13000)
2-Nitrophenol	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
3,3'-Dichlorobenzidine	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
3-Nitroaniline	ug/L	-	ND(13000)	-	-	ND(130000)	-	ND(13000)
4,6-Dinitro-2-methylphenol	ug/L	-	ND(13000)	-	-	ND(130000)	-	ND(13000)
4-Bromophenyl phenyl ether	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
4-Chloro-3-methylphenol	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
4-Chloroaniline	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
4-Chlorophenyl phenyl ether	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
4-Methylphenol	ug/L	-	150000	-	-	95000	-	130000
4-Nitroaniline	ug/L	-	ND(13000)	-	-	ND(130000)	-	ND(13000)
4-Nitrophenol	ug/L	-	ND(13000)	-	-	ND(130000)	-	ND(13000)
Acenaphthene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Acenaphthylene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Anthracene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Benzo(a)anthracene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Benzo(a)pyrene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Benzo(b)fluoranthene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Benzo(g,h,i)perylene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Benzo(k)fluoranthene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
bis(2-Chloroethoxy)methane	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
bis(2-Chloroethyl)ether	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
bis(2-Chloroisopropyl)ether	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
bis(2-Ethylhexyl)phthalate	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Butyl benzylphthalate	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Carbazole	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Chrysene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Dibenz(a,h)anthracene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Dibenzofuran	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Diethyl phthalate	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Dimethyl phthalate	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Di-n-butylphthalate	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Di-n-octyl phthalate	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Fluoranthene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Fluorene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Hexachlorobenzene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Hexachlorobutadiene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Hexachlorocyclopentadiene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Hexachloroethane	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Indeno(1,2,3-cd)pyrene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Isophorone	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Naphthalene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Nitrobenzene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
N-Nitrosodi-n-propylamine	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
N-Nitrosodiphenylamine	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Pentachlorophenol	ug/L	-	ND(13000)	-	-	ND(130000)	-	ND(13000)
Phenanthrene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)
Phenol	ug/L	-	210000	-	-	160000	-	210000
Pyrene	ug/L	-	ND(5000)	-	-	ND(50000)	-	ND(5000)

GROUNDWATER ANALYTICAL RESULTS - WN-3D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*	*WN-3D*
Sample ID:		*GW-103000-WP-364*	*GW-110200-WP-401*	*GW-110500-WP-447*	*GW-111300-WP-559*	*GW-111600-WP-606*	*GW-111900-WP-652*	*GW-112700-WP-685*
Sample Date:		*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*	*11/27/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	2400	3000	1400	830	2900	2400	2100
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	-	-	-	-	3200	-	-
Ammonia	mg/L	1400	1400	1300	1500	94	1700	1500
Cyanide (total)	mg/L	-	0.71	-	-	-	-	0.51
Nitrate (as N)	mg/L	-	-	-	-	0.24	-	-
Phenolics (Total)	mg/L	910	950	810	840	650	7.4	790
Thiocyanate	mg/L	-	330	-	-	14000	-	1400
Total Suspended Solids (TSS)	mg/L	-	-	-	-	ND(10)	-	-

GROUNDWATER ANALYTICAL RESULTS - WN-3D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3D*
Sample ID:		*GW-121800-WP-712*
Sample Date:		*12/18/2000*
Parameter	*Unit*	
Volatiles		
1,1,1-Trichloroethane	ug/L	ND(5.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(5 0)
1,1,2-Trichloroethane	ug/L	ND(5.0)
1,1-Dichloroethane	ug/L	ND(5 0)
1,1-Dichloroethene	ug/L	ND(5.0)
1,2-Dichloroethane	ug/L	ND(5.0)
1,2-Dichloropropane	ug/L	ND(5.0)
2-Butanone	ug/L	53
2-Hexanone	ug/L	ND(25)
4-Methyl-2-pentanone	ug/L	ND(25)
Acetone	ug/L	460
Benzene	ug/L	790
Bromodichloromethane	ug/L	ND(5.0)
Bromoform	ug/L	ND(5 0)
Bromomethane	ug/L	ND(5.0)
Carbon disulfide	ug/L	ND(5 0)
Carbon tetrachloride	ug/L	ND(5 0)
Chlorobenzene	ug/L	ND(5.0)
Chlorobromomethane	ug/L	-
Chloroethane	ug/L	ND(5 0)
Chloroform	ug/L	ND(5.0)
Chloromethane	ug/L	ND(5.0)
cis-1,2-Dichloroethene	ug/L	ND(5.0)
cis-1,3-Dichloropropene	ug/L	ND(5.0)
Dibromochloromethane	ug/L	ND(5.0)
Ethylbenzene	ug/L	ND(5.0)
Methylene chloride	ug/L	ND(5.0)
Styrene	ug/L	14
Tetrachloroethene	ug/L	ND(5.0)
Toluene	ug/L	350
trans-1,2-Dichloroethene	ug/L	ND(5.0)
trans-1,3-Dichloropropene	ug/L	ND(5.0)
Trichloroethene	ug/L	ND(5.0)
Vinyl chloride	ug/L	ND(10)
Xylene (total)	ug/L	59
Semi - Volatiles		
1,2,4-Trichlorobenzene	ug/L	ND(1000)
1,2-Dichlorobenzene	ug/L	ND(1000)
1,3-Dichlorobenzene	ug/L	ND(1000)
1,4-Dichlorobenzene	ug/L	ND(1000)
2,4,5-Trichlorophenol	ug/L	ND(2500)
2,4,6-Trichlorophenol	ug/L	ND(1000)
2,4-Dichlorophenol	ug/L	ND(1000)
2,4-Dimethylphenol	ug/L	17000
2,4-Dinitrophenol	ug/L	ND(2500)
2,4-Dinitrotoluene	ug/L	ND(1000)
2,6-Dinitrotoluene	ug/L	ND(1000)
2-Chloronaphthalene	ug/L	ND(1000)
2-Chlorophenol	ug/L	ND(1000)

TABLE H.4

GROUNDWATER ANALYTICAL RESULTS - WN-3D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3D*
Sample ID:		*GW-121800-WP-712*
Sample Date:		*12/18/2000*
Parameter	***Unit***	
2-Methyl naphthalene	ug/L	ND(1000)
2-Methylphenol	ug/L	39000
2-Nitroaniline	ug/L	ND(2500)
2-Nitrophenol	ug/L	ND(1000)
3,3'-Dichlorobenzidine	ug/L	ND(1000)
3-Nitroaniline	ug/L	ND(2500)
4,6-Dinitro-2-methylphenol	ug/L	ND(2500)
4-Bromophenyl phenyl ether	ug/L	ND(1000)
4-Chloro-3-methylphenol	ug/L	ND(1000)
4-Chloroaniline	ug/L	ND(1000)
4-Chlorophenyl phenyl ether	ug/L	ND(1000)
4-Methylphenol	ug/L	120000
4-Nitroaniline	ug/L	ND(2500)
4-Nitrophenol	ug/L	ND(2500)
Acenaphthene	ug/L	ND(1000)
Acenaphthylene	ug/L	ND(1000)
Anthracene	ug/L	ND(1000)
Benzo(a)anthracene	ug/L	ND(1000)
Benzo(a)pyrene	ug/L	ND(1000)
Benzo(b)fluoranthene	ug/L	ND(1000)
Benzo(g,h,i)perylene	ug/L	ND(1000)
Benzo(k)fluoranthene	ug/L	ND(1000)
bis(2-Chloroethoxy)methane	ug/L	ND(1000)
bis(2-Chloroethyl)ether	ug/L	ND(1000)
bis(2-Chloroisopropyl)ether	ug/L	ND(1000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(1000)
Butyl benzylphthalate	ug/L	ND(1000)
Carbazole	ug/L	ND(1000)
Chrysene	ug/L	ND(1000)
Dibenz(a,h)anthracene	ug/L	ND(1000)
Dibenzofuran	ug/L	ND(1000)
Diethyl phthalate	ug/L	ND(1000)
Dimethyl phthalate	ug/L	ND(1000)
Di-n-butylphthalate	ug/L	ND(1000)
Di-n-octyl phthalate	ug/L	ND(1000)
Fluoranthene	ug/L	ND(1000)
Fluorene	ug/L	ND(1000)
Hexachlorobenzene	ug/L	ND(1000)
Hexachlorobutadiene	ug/L	ND(1000)
Hexachlorocyclopentadiene	ug/L	ND(1000)
Hexachloroethane	ug/L	ND(1000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(1000)
Isophorone	ug/L	ND(1000)
Naphthalene	ug/L	1800
Nitrobenzene	ug/L	ND(1000)
N-Nitrosodi-n-propylamine	ug/L	ND(1000)
N-Nitrosodiphenylamine	ug/L	ND(1000)
Pentachlorophenol	ug/L	ND(2500)
Phenanthrene	ug/L	ND(1000)
Phenol	ug/L	190000
Pyrene	ug/L	ND(1000)

GROUNDWATER ANALYTICAL RESULTS - WN-3D
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3D*
Sample ID:		*GW-121800-WP-712*
Sample Date:		*12/18/2000*
Parameter	*Unit*	
Metals		
Arsenic	ug/L	2300
General Chemistry		
Alkalinity, Total (As CaCO3)	mg/L	-
Ammonia	mg/L	1600
Cyanide (total)	mg/L	0.57
Nitrate (as N)	mg/L	-
Phenolics (Total)	mg/L	610
Thiocyanate	mg/L	3500
Total Suspended Solids (TSS)	mg/L	-

TABLE H.5

GROUNDWATER ANALYTICAL RESULTS - WN-3E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*
Sample ID:		*GW-100200-WP-001*	*GW-100200-WP-002*	*GW-100400-WP-008*	*GW-100500-WP-015*	*GW-100900-WP-032*	*GW-101600-WP-141*	*GW-101900-WP-179*
Sample Date:		*10/2/2000*	*10/2/2000* *Dupl.*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(5 0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ug/L	ND(5.0)	ND(5 0)	-	ND(5 0)	-	ND(10)	ND(10)
1,1,2-Trichloroethane	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
1,1-Dichloroethane	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
1,1-Dichloroethene	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
1,2-Dichloroethane	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
1,2-Dichloropropane	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
2-Butanone	ug/L	73	72	-	80	-	81	270
2-Hexanone	ug/L	ND(25)	ND(25)	-	ND(25)	-	ND(50)	ND(50)
4-Methyl-2-pentanone	ug/L	ND(25)	ND(25)	-	ND(25)	-	ND(50)	ND(50)
Acetone	ug/L	490	480	-	510	-	450	1700
Benzene	ug/L	960	960	-	1100	-	890	1000 J
Bromodichloromethane	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Bromoform	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Bromomethane	ug/L	ND(5.0)	ND(5 0)	-	ND(10)	-	ND(10)	ND(10)
Carbon disulfide	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Carbon tetrachloride	ug/L	ND(5 0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Chlorobenzene	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Chlorobromomethane	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Chloroethane	ug/L	ND(5.0)	ND(5.0)	-	ND(10)	-	ND(10)	ND(10)
Chloroform	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Chloromethane	ug/L	ND(5.0)	ND(5.0)	-	ND(10)	-	ND(10)	ND(10)
cis-1,2-Dichloroethene	ug/L	ND(5.0)	ND(5.0)	-	ND(5 0)	-	ND(10)	ND(10)
cis-1,3-Dichloropropene	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0) UJ	-	ND(10)	ND(10)
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	5.3	5.2	-	5.3	-	ND(10)	18
Methylene chloride	ug/L	ND(5 0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Styrene	ug/L	27	27	-	32	-	38	100
Tetrachloroethene	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Toluene	ug/L	300	310	-	390	-	320	800
trans-1,2-Dichloroethene	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
trans-1,3-Dichloropropene	ug/L	ND(5 0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Trichloroethene	ug/L	ND(5.0)	ND(5.0)	-	ND(5.0)	-	ND(10)	ND(10)
Vinyl chloride	ug/L	ND(5.0)	ND(5.0)	-	ND(10)	-	ND(10)	ND(10)
Xylene (total)	ug/L	130	130	-	150	-	160	430
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
1,2-Dichlorobenzene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
1,3-Dichlorobenzene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
1,4-Dichlorobenzene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
2,4,5-Trichlorophenol	ug/L	ND(500)	ND(130000)	-	ND(130000)	-	ND(25000)	ND(63000)
2,4,6-Trichlorophenol	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
2,4-Dichlorophenol	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
2,4-Dimethylphenol	ug/L	ND(100000)	ND(50000)	-	24000	-	ND(10000)	28000
2,4-Dinitrophenol	ug/L	ND(500)	ND(130000)	-	ND(130000)	-	ND(25000)	ND(63000)
2,4-Dinitrotoluene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
2,6-Dinitrotoluene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
2-Chloronaphthalene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
2-Chlorophenol	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)

GROUNDWATER ANALYTICAL RESULTS - WN-3E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*
Sample ID:		*GW-100200-WP-001*	*GW-100200-WP-002*	*GW-100400-WP-008*	*GW-100500-WP-015*	*GW-100900-WP-032*	*GW-101600-WP-141*	*GW-101900-WP-179*
Sample Date:		*10/2/2000*	*10/2/2000*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*
			Dupl.					
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
2-Methylphenol	ug/L	110000	77000	-	87000	-	16000	94000
2-Nitroaniline	ug/L	ND(500)	ND(130000)	-	ND(130000)	-	ND(25000)	ND(63000)
2-Nitrophenol	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
3,3'-Dichlorobenzidine	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
3-Nitroaniline	ug/L	ND(500)	ND(130000)	-	ND(130000)	-	ND(25000)	ND(63000)
4,6-Dinitro-2-methylphenol	ug/L	ND(500)	ND(130000)	-	ND(130000)	-	ND(25000)	ND(63000)
4-Bromophenyl phenyl ether	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
4-Chloro-3-methylphenol	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
4-Chloroaniline	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
4-Chlorophenyl phenyl ether	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
4-Methylphenol	ug/L	330000	240000	-	270000	-	53000	290000
4-Nitroaniline	ug/L	ND(500)	ND(130000)	-	ND(130000)	-	ND(25000)	ND(63000)
4-Nitrophenol	ug/L	ND(500)	ND(130000)	-	ND(130000)	-	ND(25000)	ND(63000)
Acenaphthene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Acenaphthylene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Anthracene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Benzo(a)anthracene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Benzo(a)pyrene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Benzo(b)fluoranthene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Benzo(g,h,i)perylene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Benzo(k)fluoranthene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
bis(2-Chloroethoxy)methane	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
bis(2-Chloroethyl)ether	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
bis(2-Chloroisopropyl)ether	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Butyl benzylphthalate	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Carbazole	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Chrysene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Dibenz(a,h)anthracene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Dibenzofuran	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Diethyl phthalate	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Dimethyl phthalate	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Di-n-butylphthalate	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Di-n-octyl phthalate	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Fluoranthene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Fluorene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Hexachlorobenzene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Hexachlorobutadiene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Hexachlorocyclopentadiene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Hexachloroethane	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Isophorone	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Naphthalene	ug/L	630	ND(50000)	-	15000	-	ND(10000)	ND(25000)
Nitrobenzene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
N-Nitrosodi-n-propylamine	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
N-Nitrosodiphenylamine	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Pentachlorophenol	ug/L	ND(500)	ND(130000)	-	ND(130000)	-	ND(25000)	ND(63000)
Phenanthrene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)
Phenol	ug/L	510000	360000	-	400000	-	78000	440000
Pyrene	ug/L	ND(200)	ND(50000)	-	ND(50000)	-	ND(10000)	ND(25000)

GROUNDWATER ANALYTICAL RESULTS - WN-3E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*
Sample ID:		*GW-100200-WP-001*	*GW-100200-WP-002*	*GW-100400-WP-008*	*GW-100500-WP-015*	*GW-100900-WP-032*	*GW-101600-WP-141*	*GW-101900-WP-179*
Sample Date:		*10/2/2000*	*10/2/2000* *Dupl.*	*10/4/2000*	*10/5/2000*	*10/9/2000*	*10/16/2000*	*10/19/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	12000	12000	17000	17000	18000	21000	14000
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	-	-	-	-	-	-	-
Ammonia	mg/L	-	-	1600	1900	2100	1600	1300
Cyanide (total)	mg/L	0.86	0.92	-	0.89	-	0.94	1.0
Nitrate (as N)	mg/L	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	6800 J	1700	1800	1800	1400	990 J	1500
Thiocyanate	mg/L	520	460	-	660	-	5100	6000
Total Suspended Solids (TSS)	mg/L	-	-	-	-	-	-	-

TABLE H.5

GROUNDWATER ANALYTICAL RESULTS - WN-3E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*
Sample ID:		*GW-102200-WP-219*	*GW-103000-WP-365*	*GW-110200-WP-402*	*GW-110500-WP-448*	*GW-111300-WP-560*	*GW-111600-WP-607*	*GW-111900-WP-653*
Sample Date:		*10/22/2000*	*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,1,2,2-Tetrachloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,1,2-Trichloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,1-Dichloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,1-Dichloroethene	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,2-Dichloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
1,2-Dichloropropane	ug/L	-	-	ND(10)	-	-	ND(10)	-
2-Butanone	ug/L	-	-	96	-	-	110	-
2-Hexanone	ug/L	-	-	ND(50)	-	-	ND(50)	-
4-Methyl-2-pentanone	ug/L	-	-	ND(50)	-	-	ND(50)	-
Acetone	ug/L	-	-	920	-	-	740	-
Benzene	ug/L	-	-	900	-	-	1100	-
Bromodichloromethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
Bromoform	ug/L	-	-	ND(10)	-	-	ND(10)	-
Bromomethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
Carbon disulfide	ug/L	-	-	ND(10)	-	-	ND(10)	-
Carbon tetrachloride	ug/L	-	-	ND(10)	-	-	ND(10)	-
Chlorobenzene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Chlorobromomethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
Chloroethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
Chloroform	ug/L	-	-	ND(10)	-	-	ND(10)	-
Chloromethane	ug/L	-	-	ND(10)	-	-	ND(10)	-
cis-1,2-Dichloroethene	ug/L	-	-	ND(10)	-	-	ND(10)	-
cis-1,3-Dichloropropene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Dibromochloromethane	ug/L	-	-	-	-	-	-	-
Ethylbenzene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Methylene chloride	ug/L	-	-	ND(10)	-	-	ND(10)	-
Styrene	ug/L	-	-	43	-	-	39	-
Tetrachloroethene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Toluene	ug/L	-	-	360	-	-	350	-
trans-1,2-Dichloroethene	ug/L	-	-	ND(10)	-	-	ND(10)	-
trans-1,3-Dichloropropene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Trichloroethene	ug/L	-	-	ND(10)	-	-	ND(10)	-
Vinyl chloride	ug/L	-	-	ND(10)	-	-	ND(10)	-
Xylene (total)	ug/L	-	-	180	-	-	170	-
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
1,2-Dichlorobenzene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
1,3-Dichlorobenzene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
1,4-Dichlorobenzene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
2,4,5-Trichlorophenol	ug/L	-	-	ND(63000)	-	-	ND(130000)	-
2,4,6-Trichlorophenol	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
2,4-Dichlorophenol	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
2,4-Dimethylphenol	ug/L	-	-	28000	-	-	ND(50000)	-
2,4-Dinitrophenol	ug/L	-	-	ND(63000)	-	-	ND(130000)	-
2,4-Dinitrotoluene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
2,6-Dinitrotoluene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
2-Chloronaphthalene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
2-Chlorophenol	ug/L	-	-	ND(25000)	-	-	ND(50000)	-

TABLE H.5

GROUNDWATER ANALYTICAL RESULTS - WN-3E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*
Sample ID:		*GW-102200-WP-219*	*GW-103000-WP-365*	*GW-110200-WP-402*	*GW-110500-WP-448*	*GW-111300-WP-560*	*GW-111600-WP-607*	*GW-111900-WP-653*
Sample Date:		*10/22/2000*	*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*
Parameter	*Unit*							
2-Methyl naphthalene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
2-Methylphenol	ug/L	-	-	98000	-	-	110000	-
2-Nitroaniline	ug/L	-	-	ND(63000)	-	-	ND(130000)	-
2-Nitrophenol	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
3,3'-Dichlorobenzidine	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
3-Nitroaniline	ug/L	-	-	ND(63000)	-	-	ND(130000)	-
4,6-Dinitro-2-methylphenol	ug/L	-	-	ND(63000)	-	-	ND(130000)	-
4-Bromophenyl phenyl ether	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
4-Chloro-3-methylphenol	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
4-Chloroaniline	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
4-Chlorophenyl phenyl ether	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
4-Methylphenol	ug/L	-	-	330000	-	-	340000	-
4-Nitroaniline	ug/L	-	-	ND(63000)	-	-	ND(130000)	-
4-Nitrophenol	ug/L	-	-	ND(63000)	-	-	ND(130000)	-
Acenaphthene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Acenaphthylene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Anthracene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Benzo(a)anthracene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Benzo(a)pyrene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Benzo(b)fluoranthene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Benzo(g,h,i)perylene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Benzo(k)fluoranthene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
bis(2-Chloroethoxy)methane	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
bis(2-Chloroethyl)ether	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
bis(2-Chloroisopropyl)ether	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
bis(2-Ethylhexyl)phthalate	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Butyl benzylphthalate	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Carbazole	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Chrysene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Dibenz(a,h)anthracene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Dibenzofuran	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Diethyl phthalate	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Dimethyl phthalate	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Di-n-butylphthalate	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Di-n-octyl phthalate	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Fluoranthene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Fluorene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Hexachlorobenzene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Hexachlorobutadiene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Hexachlorocyclopentadiene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Hexachloroethane	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Indeno(1,2,3-cd)pyrene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Isophorone	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Naphthalene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Nitrobenzene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
N-Nitrosodi-n-propylamine	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
N-Nitrosodiphenylamine	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Pentachlorophenol	ug/L	-	-	ND(63000)	-	-	ND(130000)	-
Phenanthrene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-
Phenol	ug/L	-	-	440000	-	-	520000	-
Pyrene	ug/L	-	-	ND(25000)	-	-	ND(50000)	-

TABLE H.5

GROUNDWATER ANALYTICAL RESULTS - WN-3E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*	*WN-3E*
Sample ID:		*GW-102200-WP-219*	*GW-103000-WP-365*	*GW-110200-WP-402*	*GW-110500-WP-448*	*GW-111300-WP-560*	*GW-111600-WP-607*	*GW-111900-WP-653*
Sample Date:		*10/22/2000*	*10/30/2000*	*11/2/2000*	*11/5/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*
Parameter	*Unit*							
Metals								
Arsenic	ug/L	16000	18000	14000	1200	4000	20000	10000
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	-	-	-	-	-	3900	-
Ammonia	mg/L	1500	1900	1800	1600	2000	110	2100
Cyanide (total)	mg/L	-	-	1.4	-	-	-	-
Nitrate (as N)	mg/L	-	-	-	-	-	0.45	-
Phenolics (Total)	mg/L	1600	1400	1600	1600	17	1400	8 2
Thiocyanate	mg/L	-	-	5.5	-	-	12000	-
Total Suspended Solids (TSS)	mg/L	-	-	-	-	-	ND(10)	-

GROUNDWATER ANALY_ _AL RESULTS - WN-3E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3E*	*WN-3E*	*WN-3E*
Sample ID:		*GW-112700-WP-686*	*GW-112700-WP-687*	*GW-121800-WP-713*
Sample Date:		*11/27/2000*	*11/27/2000*	*12/18/2000*
			Dupl.	
Parameter	*Unit*			
Volatiles				
1,1,1-Trichloroethane	ug/L	ND(10)	ND(10)	ND(5.0)
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	ND(10)	ND(5.0)
1,1,2-Trichloroethane	ug/L	ND(10)	ND(10)	ND(5.0)
1,1-Dichloroethane	ug/L	ND(10)	ND(10)	ND(5.0)
1,1-Dichloroethene	ug/L	ND(10)	ND(10)	ND(5.0)
1,2-Dichloroethane	ug/L	ND(10)	ND(10)	30
1,2-Dichloropropane	ug/L	ND(10)	ND(10)	ND(5.0)
2-Butanone	ug/L	110	110	110
2-Hexanone	ug/L	ND(50)	ND(50)	ND(25)
4-Methyl-2-pentanone	ug/L	ND(50)	ND(50)	ND(25)
Acetone	ug/L	770	770	780
Benzene	ug/L	1100	1100	1000
Bromodichloromethane	ug/L	ND(10)	ND(10)	ND(5.0)
Bromoform	ug/L	ND(10)	ND(10)	ND(5.0)
Bromomethane	ug/L	ND(10)	ND(10)	ND(5.0)
Carbon disulfide	ug/L	ND(10)	ND(10)	ND(5.0)
Carbon tetrachloride	ug/L	ND(10)	ND(10)	ND(5.0)
Chlorobenzene	ug/L	ND(10)	ND(10)	ND(5.0)
Chlorobromomethane	ug/L	ND(10)	ND(10)	-
Chloroethane	ug/L	ND(10)	ND(10)	ND(5.0)
Chloroform	ug/L	ND(10)	ND(10)	ND(5.0)
Chloromethane	ug/L	ND(10)	ND(10)	8.2
cis-1,2-Dichloroethene	ug/L	ND(10)	ND(10)	ND(5.0)
cis-1,3-Dichloropropene	ug/L	ND(10)	ND(10)	11
Dibromochloromethane	ug/L	-	-	ND(5.0)
Ethylbenzene	ug/L	ND(10)	ND(10)	5.3
Methylene chloride	ug/L	ND(10)	ND(10)	ND(5.0)
Styrene	ug/L	40	40	30
Tetrachloroethene	ug/L	ND(10)	ND(10)	ND(5.0)
Toluene	ug/L	380	380	380
trans-1,2-Dichloroethene	ug/L	ND(10)	ND(10)	ND(5.0)
trans-1,3-Dichloropropene	ug/L	ND(10)	ND(10)	17
Trichloroethene	ug/L	ND(10)	ND(10)	22
Vinyl chloride	ug/L	ND(10)	ND(10)	ND(10)
Xylene (total)	ug/L	180	180	140
Semi - Volatiles				
1,2,4-Trichlorobenzene	ug/L	ND(25000)	ND(25000)	ND(5000)
1,2-Dichlorobenzene	ug/L	ND(25000)	ND(25000)	ND(5000)
1,3-Dichlorobenzene	ug/L	ND(25000)	ND(25000)	ND(5000)
1,4-Dichlorobenzene	ug/L	ND(25000)	ND(25000)	ND(5000)
2,4,5-Trichlorophenol	ug/L	ND(63000)	ND(63000)	ND(13000)
2,4,6-Trichlorophenol	ug/L	ND(25000)	ND(25000)	ND(5000)
2,4-Dichlorophenol	ug/L	ND(25000)	ND(25000)	ND(5000)
2,4-Dimethylphenol	ug/L	27000	34000	38000
2,4-Dinitrophenol	ug/L	ND(63000)	ND(63000)	ND(13000)
2,4-Dinitrotoluene	ug/L	ND(25000)	ND(25000)	ND(5000)
2,6-Dinitrotoluene	ug/L	ND(25000)	ND(25000)	ND(5000)
2-Chloronaphthalene	ug/L	ND(25000)	ND(25000)	ND(5000)
2-Chlorophenol	ug/L	ND(25000)	ND(25000)	ND(5000)

GROUNDWATER ANALYTICAL RESULTS - WN-3E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3E*	*WN-3E*	*WN-3E*
Sample ID:		*GW-112700-WP-686*	*GW-112700-WP-687*	*GW-121800-WP-713*
Sample Date:		*11/27/2000*	*11/27/2000*	*12/18/2000*
			Dupl.	
Parameter	*Unit*			
2-Methyl naphthalene	ug/L	ND(25000)	ND(25000)	ND(5000)
2-Methylphenol	ug/L	92000	100000	86000
2-Nitroaniline	ug/L	ND(63000)	ND(63000)	ND(13000)
2-Nitrophenol	ug/L	ND(25000)	ND(25000)	ND(5000)
3,3'-Dichlorobenzidine	ug/L	ND(25000)	ND(25000)	ND(5000)
3-Nitroaniline	ug/L	ND(63000)	ND(63000)	ND(13000)
4,6-Dinitro-2-methylphenol	ug/L	ND(63000)	ND(63000)	ND(13000)
4-Bromophenyl phenyl ether	ug/L	ND(25000)	ND(25000)	ND(5000)
4-Chloro-3-methylphenol	ug/L	ND(25000)	ND(25000)	ND(5000)
4-Chloroaniline	ug/L	ND(25000)	ND(25000)	ND(5000)
4-Chlorophenyl phenyl ether	ug/L	ND(25000)	ND(25000)	ND(5000)
4-Methylphenol	ug/L	330000	330000	310000
4-Nitroaniline	ug/L	ND(63000)	ND(63000)	ND(13000)
4-Nitrophenol	ug/L	ND(63000)	ND(63000)	ND(13000)
Acenaphthene	ug/L	ND(25000)	ND(25000)	ND(5000)
Acenaphthylene	ug/L	ND(25000)	ND(25000)	ND(5000)
Anthracene	ug/L	ND(25000)	ND(25000)	ND(5000)
Benzo(a)anthracene	ug/L	ND(25000)	ND(25000)	ND(5000)
Benzo(a)pyrene	ug/L	ND(25000)	ND(25000)	ND(5000)
Benzo(b)fluoranthene	ug/L	ND(25000)	ND(25000)	ND(5000)
Benzo(g,h,i)perylene	ug/L	ND(25000)	ND(25000)	ND(5000)
Benzo(k)fluoranthene	ug/L	ND(25000)	ND(25000)	ND(5000)
bis(2-Chloroethoxy)methane	ug/L	ND(25000)	ND(25000)	ND(5000)
bis(2-Chloroethyl)ether	ug/L	ND(25000)	ND(25000)	ND(5000)
bis(2-Chloroisopropyl)ether	ug/L	ND(25000)	ND(25000)	ND(5000)
bis(2-Ethylhexyl)phthalate	ug/L	ND(25000)	ND(25000)	ND(5000)
Butyl benzylphthalate	ug/L	ND(25000)	ND(25000)	ND(5000)
Carbazole	ug/L	ND(25000)	ND(25000)	ND(5000)
Chrysene	ug/L	ND(25000)	ND(25000)	ND(5000)
Dibenz(a,h)anthracene	ug/L	ND(25000)	ND(25000)	ND(5000)
Dibenzofuran	ug/L	ND(25000)	ND(25000)	ND(5000)
Diethyl phthalate	ug/L	ND(25000)	ND(25000)	ND(5000)
Dimethyl phthalate	ug/L	ND(25000)	ND(25000)	ND(5000)
Di-n-butylphthalate	ug/L	ND(25000)	ND(25000)	ND(5000)
Di-n-octyl phthalate	ug/L	ND(25000)	ND(25000)	ND(5000)
Fluoranthene	ug/L	ND(25000)	ND(25000)	ND(5000)
Fluorene	ug/L	ND(25000)	ND(25000)	ND(5000)
Hexachlorobenzene	ug/L	ND(25000)	ND(25000)	ND(5000)
Hexachlorobutadiene	ug/L	ND(25000)	ND(25000)	ND(5000)
Hexachlorocyclopentadiene	ug/L	ND(25000)	ND(25000)	ND(5000)
Hexachloroethane	ug/L	ND(25000)	ND(25000)	ND(5000)
Indeno(1,2,3-cd)pyrene	ug/L	ND(25000)	ND(25000)	ND(5000)
Isophorone	ug/L	ND(25000)	ND(25000)	ND(5000)
Naphthalene	ug/L	ND(25000)	ND(25000)	ND(5000)
Nitrobenzene	ug/L	ND(25000)	ND(25000)	ND(5000)
N-Nitrosodi-n-propylamine	ug/L	ND(25000)	ND(25000)	ND(5000)
N-Nitrosodiphenylamine	ug/L	ND(25000)	ND(25000)	ND(5000)
Pentachlorophenol	ug/L	ND(63000)	ND(63000)	ND(13000)
Phenanthrene	ug/L	ND(25000)	ND(25000)	ND(5000)
Phenol	ug/L	430000	540000	450000
Pyrene	ug/L	ND(25000)	ND(25000)	ND(5000)

GROUNDWATER ANALYTICAL RESULTS - WN-3E
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*WN-3E*	*WN-3E*	*WN-3E*
Sample ID:		*GW-112700-WP-686*	*GW-112700-WP-687*	*GW-121800-WP-713*
Sample Date:		*11/27/2000*	*11/27/2000*	*12/18/2000*
			Dupl.	
Parameter	*Unit*			
Metals				
Arsenic	ug/L	37000 J	19000	7400
General Chemistry				
Alkalinity, Total (As CaCO3)	mg/L	-	-	-
Ammonia	mg/L	2100	2600	27
Cyanide (total)	mg/L	1.8	0.16	0.81
Nitrate (as N)	mg/L	-	-	-
Phenolics (Total)	mg/L	1500	1200	1400
Thiocyanate	mg/L	6900	6000	6700
Total Suspended Solids (TSS)	mg/L	-	-	-

GROUNDWATER ANALYTICAL RESULTS - EW-4
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location		*EW-4*	*EW-4*	*EW-4*	*EW-4*	*EW-4*	*EW-4*	*EW-4*
Sample ID		*GW-100200-WP-007*	*GW-100500-WP-014*	*GW-100700-WP-020*	*GW-101600-WP-136*	*GW-101900-WP-174*	*GW-102100-WP-204*	*GW-102900-WP-346*
Sample Date		*10/2/2000*	*10/5/2000*	*10/7/2000*	*10/16/2000*	*10/19/2000*	*10/21/2000*	*10/30/2000*
Parameter	*Unit*							
Volatiles								
1,1,1-Trichloroethane	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2-Trichloroethane	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethane	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethene	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethane	ug/L	ND(5.0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloropropane	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
2-Butanone	ug/L	ND(25)	ND(50)	11	ND(50)	ND(50)	ND(50)	ND(50)
2-Hexanone	ug/L	ND(25)	ND(50)	ND(10)	ND(50)	ND(50)	ND(50)	ND(50)
4-Methyl-2-pentanone	ug/L	ND(25)	ND(50)	ND(10)	ND(50)	ND(50)	ND(50)	ND(50)
Acetone	ug/L	130	120	59	ND(50)	ND(50)	ND(50)	ND(50)
Benzene	ug/L	750	570	330	230	300	260	180
Bromodichloromethane	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Bromoform	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Bromomethane	ug/L	ND(5 0)	ND(20)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon disulfide	ug/L	10.0	12	13	ND(10)	ND(10)	ND(10)	ND(10)
Carbon tetrachloride	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobenzene	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobromomethane	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroethane	ug/L	ND(5 0)	ND(20)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroform	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Chloromethane	ug/L	ND(5.0)	ND(20)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,2-Dichloroethene	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,3-Dichloropropene	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Ethylbenzene	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Methylene chloride	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Styrene	ug/L	15	ND(10)	9.1	ND(10)	ND(10)	ND(10)	ND(10)
Tetrachloroethene	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Toluene	ug/L	340	230	160	130	190	170	120
trans-1,2-Dichloroethene	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
trans-1,3-Dichloropropene	ug/L	ND(5.0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Trichloroethene	ug/L	ND(5 0)	ND(10)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Vinyl chloride	ug/L	ND(5 0)	ND(20)	ND(2.0)	ND(10)	ND(10)	ND(10)	ND(10)
Xylene (total)	ug/L	72	36	45	36	51	47	30
Semi - Volatiles								
1,2,4-Trichlorobenzene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
1,2-Dichlorobenzene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
1,3-Dichlorobenzene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
1,4-Dichlorobenzene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
2,4,5-Trichlorophenol	ug/L	ND(25000)	ND(130)	ND(2600)	ND(2500)	ND(1300)	ND(2500)	ND(1300)
2,4,6-Trichlorophenol	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
2,4-Dichlorophenol	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
2,4-Dimethylphenol	ug/L	8400	11000	4700	2400	1700	1600	1700
2,4-Dinitrophenol	ug/L	ND(25000)	ND(130)	ND(2600)	ND(2500)	ND(1300)	ND(2500)	ND(1300)
2,4-Dinitrotoluene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
2,6-Dinitrotoluene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
2-Chloronaphthalene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
2-Chlorophenol	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
2-Methyl naphthalene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)

GROUNDWATER ANALYTICAL RESULTS - EW-4
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-4*	*EW-4*	*EW-4*	*EW-4*	*EW-4*	*EW-4*	*EW-4*
Sample ID.		*GW-100200-WP-007*	*GW-100500-WP-014*	*GW-100700-WP-020*	*GW-101600-WP-136*	*GW-101900-WP-174*	*GW-102100-WP-204*	*GW-102900-WP-346*
Sample Date.		*10/2/2000*	*10/5/2000*	*10/7/2000*	*10/16/2000*	*10/19/2000*	*10/21/2000*	*10/30/2000*
Parameter	*Unit*							
2-Methylphenol	ug/L	23000	31000	8800	3300	2300	1800	1900
2-Nitroaniline	ug/L	ND(25000)	ND(130)	ND(2600)	ND(2500)	ND(1300)	ND(2500)	ND(1300)
2-Nitrophenol	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
3,3'-Dichlorobenzidine	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
3-Nitroaniline	ug/L	ND(25000)	ND(130)	ND(2600)	ND(2500)	ND(1300)	ND(2500)	ND(1300)
4,6-Dinitro-2-methylphenol	ug/L	ND(25000)	ND(130)	ND(2600)	ND(2500)	ND(1300)	ND(2500)	ND(1300)
4-Bromophenyl phenyl ether	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
4-Chloro-3-methylphenol	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
4-Chloroaniline	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
4-Chlorophenyl phenyl ether	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
4-Methylphenol	ug/L	67000	95000	17000	9300	6300	4800	5100
4-Nitroaniline	ug/L	ND(25000)	ND(130)	ND(2600)	ND(2500)	ND(1300)	ND(2500)	ND(1300)
4-Nitrophenol	ug/L	ND(25000)	ND(130)	ND(2600)	ND(2500)	ND(1300)	ND(2500)	ND(1300)
Acenaphthene	ug/L	ND(10000)	ND(50)	ND(1000) UJ	ND(1000)	ND(500)	ND(1000)	ND(500)
Acenaphthylene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Anthracene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Benzo(a)anthracene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Benzo(a)pyrene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Benzo(b)fluoranthene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Benzo(g,h,i)perylene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Benzo(k)fluoranthene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
bis(2-Chloroethoxy)methane	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
bis(2-Chloroethyl)ether	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
bis(2-Chloroisopropyl)ether	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
bis(2-Ethylhexyl)phthalate	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Butyl benzylphthalate	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Carbazole	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Chrysene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Dibenz(a,h)anthracene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Dibenzofuran	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Diethyl phthalate	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Dimethyl phthalate	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Di-n-butylphthalate	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Di-n-octyl phthalate	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Fluoranthene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Fluorene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Hexachlorobenzene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Hexachlorobutadiene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Hexachlorocyclopentadiene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Hexachloroethane	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Indeno(1,2,3-cd)pyrene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Isophorone	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Naphthalene	ug/L	4000	7200	1200	1000	950	1000	940
Nitrobenzene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
N-Nitrosodi-n-propylamine	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
N-Nitrosodiphenylamine	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Pentachlorophenol	ug/L	ND(25000)	ND(130)	ND(2600)	ND(2500)	ND(1300)	ND(2500)	ND(1300)
Phenanthrene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Phenol	ug/L	97000	140000	23000	9400	6000	4000	4400
Pyrene	ug/L	ND(10000)	ND(50)	ND(1000)	ND(1000)	ND(500)	ND(1000)	ND(500)
Metals								

GROUNDWATER ANALYTICAL RESULTS - EW-4
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-4*	*EW-4*	*EW-4*	*EW-4*	*EW-4*	*EW-4*	*EW-4*
Sample ID:		*GW-100200-WP-007*	*GW-100500-WP-014*	*GW-100700-WP-020*	*GW-101600-WP-136*	*GW-101900-WP-174*	*GW-102100-WP-204*	*GW-102900-WP-346*
Sample Date:		*10/2/2000*	*10/5/2000*	*10/7/2000*	*10/16/2000*	*10/19/2000*	*10/21/2000*	*10/30/2000*
Parameter	*Unit*							
Arsenic	ug/L	2900	2600	1800	1100	970	840	880
General Chemistry								
Alkalinity, Total (As CaCO3)	mg/L	2300	1900	1500	1000	890	930	1000
Ammonia	mg/L	1100	570	770	280	310	220	280
Chemical Oxygen Demand (COD)	mg/L	3400	2100	1100	410	130	160	350
Cyanide (total)	mg/L	0 29	0 21	0.27 J	0 018	0 019	0 010	0 033
Nitrate (as N)	mg/L	ND(0 20)	ND(0 20)	-	ND(0 20)	ND(0.20)	ND(0 20)	ND(0 20)
Nitrite/Nitrate	mg/L	-	-	0 069	-	-	-	-
Phenolics (Total)	mg/L	1000	560	210	33 J	25	18	23
Thiocyanate	mg/L	72	800	1400	2300	1300	240	28
Total Suspended Solids (TSS)	mg/L	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)

TABLE H.6

GROUNDWATER ANALYTICAL RESULTS - EW-4
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location:		*EW-4*	*EW-4*	*EW-4*	*EW-4*
Sample ID:		*GW-110200-WP-403*	*GW-111300-WP-561*	*GW-111600-WP-608*	*GW-112000-WP-667*
Sample Date		*11/2/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*
Parameter	***Unit***				
Volatiles					
1,1,1-Trichloroethane	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
1,1,2,2-Tetrachloroethane	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
1,1,2-Trichloroethane	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5.0)
1,1-Dichloroethane	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
1,1-Dichloroethene	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5.0)
1,2-Dichloroethane	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
1,2-Dichloropropane	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
2-Butanone	ug/L	ND(50)	ND(50)	ND(10)	ND(25)
2-Hexanone	ug/L	ND(50)	ND(50)	ND(10)	ND(25)
4-Methyl-2-pentanone	ug/L	ND(50)	ND(50)	ND(10)	ND(25)
Acetone	ug/L	ND(50)	ND(50)	21	53 U
Benzene	ug/L	190	190	190	200
Bromodichloromethane	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5.0)
Bromoform	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
Bromomethane	ug/L	ND(10)	ND(20)	ND(2.0)	ND(5.0)
Carbon disulfide	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
Carbon tetrachloride	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5.0)
Chlorobenzene	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5.0)
Chlorobromomethane	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5.0)
Chloroethane	ug/L	ND(10)	ND(20)	ND(2.0)	ND(5.0)
Chloroform	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
Chloromethane	ug/L	ND(10)	ND(20)	ND(2.0)	ND(5 0)
cis-1,2-Dichloroethene	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
cis-1,3-Dichloropropene	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
Ethylbenzene	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
Methylene chloride	ug/L	ND(10)	ND(10)	ND(2 0)	ND(5 0)
Styrene	ug/L	ND(10)	ND(10)	6.4	6.4
Tetrachloroethene	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
Toluene	ug/L	120	120	120	120
trans-1,2-Dichloroethene	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
trans-1,3-Dichloropropene	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
Trichloroethene	ug/L	ND(10)	ND(10)	ND(2.0)	ND(5 0)
Vinyl chloride	ug/L	ND(10)	ND(20)	ND(2.0)	ND(5 0)
Xylene (total)	ug/L	32	ND(30)	31	32
Semi - Volatiles					
1,2,4-Trichlorobenzene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
1,2-Dichlorobenzene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
1,3-Dichlorobenzene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
1,4-Dichlorobenzene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
2,4,5-Trichlorophenol	ug/L	ND(5000)	ND(5000)	ND(2500)	ND(2500) UJ
2,4,6-Trichlorophenol	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
2,4-Dichlorophenol	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
2,4-Dimethylphenol	ug/L	2100	ND(2000)	1700	2200 J
2,4-Dinitrophenol	ug/L	ND(5000)	ND(5000)	ND(2500)	ND(2500) UJ
2,4-Dinitrotoluene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
2,6-Dinitrotoluene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
2-Chloronaphthalene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
2-Chlorophenol	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
2-Methyl naphthalene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ

GROUNDWATER ANALYTICAL RESULTS - EW-4
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*EW-4*	*EW-4*	*EW-4*	*EW-4*
Sample ID:		*GW-110200-WP-403*	*GW-111300-WP-561*	*GW-111600-WP-608*	*GW-112000-WP-667*
Sample Date.		*11/2/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*
Parameter	*Unit*				
2-Methylphenol	ug/L	3000	2500	2400	2800 J
2-Nitroaniline	ug/L	ND(5000)	ND(5000)	ND(2500)	ND(2500) UJ
2-Nitrophenol	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
3,3'-Dichlorobenzidine	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
3-Nitroaniline	ug/L	ND(5000)	ND(5000)	ND(2500)	ND(2500) UJ
4,6-Dinitro-2-methylphenol	ug/L	ND(5000)	ND(5000)	ND(2500)	ND(2500) UJ
4-Bromophenyl phenyl ether	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
4-Chloro-3-methylphenol	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
4-Chloroaniline	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
4-Chlorophenyl phenyl ether	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
4-Methylphenol	ug/L	8600	5900	6800	7800 J
4-Nitroaniline	ug/L	ND(5000)	ND(5000)	ND(2500)	ND(2500) UJ
4-Nitrophenol	ug/L	ND(5000)	ND(5000)	ND(2500)	ND(2500) UJ
Acenaphthene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Acenaphthylene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Anthracene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Benzo(a)anthracene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Benzo(a)pyrene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Benzo(b)fluoranthene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Benzo(g,h,i)perylene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Benzo(k)fluoranthene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
bis(2-Chloroethoxy)methane	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
bis(2-Chloroethyl)ether	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
bis(2-Chloroisopropyl)ether	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
bis(2-Ethylhexyl)phthalate	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Butyl benzylphthalate	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Carbazole	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Chrysene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Dibenz(a,h)anthracene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Dibenzofuran	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Diethyl phthalate	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Dimethyl phthalate	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Di-n-butylphthalate	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Di-n-octyl phthalate	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Fluoranthene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Fluorene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Hexachlorobenzene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Hexachlorobutadiene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Hexachlorocyclopentadiene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Hexachloroethane	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Indeno(1,2,3-cd)pyrene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Isophorone	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Naphthalene	ug/L	ND(2000)	ND(2000)	ND(1000)	1100 J
Nitrobenzene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
N-Nitrosodi-n-propylamine	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
N-Nitrosodiphenylamine	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Pentachlorophenol	ug/L	ND(5000)	ND(5000)	ND(2500)	ND(2500) UJ
Phenanthrene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Phenol	ug/L	8500	8400	7900	7700 J
Pyrene	ug/L	ND(2000)	ND(2000)	ND(1000)	ND(1000) UJ
Metals					

GROUNDWATER ANALYTICAL RESULTS - EW-4
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Sample Location.		*EW-4*	*EW-4*	*EW-4*	*EW-4*
Sample ID·		*GW-110200-WP-403*	*GW-111300-WP-561*	*GW-111600-WP-608*	*GW-112000-WP-667*
Sample Date:		*11/2/2000*	*11/13/2000*	*11/16/2000*	*11/19/2000*
Parameter	*Unit*				
Arsenic	ug/L	870	670	780	680
General Chemistry					
Alkalinity, Total (As CaCO3)	mg/L	930	970	870	890
Ammonia	mg/L	260 J	330	290	280
Chemical Oxygen Demand (COD)	mg/L	320	720	270	250
Cyanide (total)	mg/L	0 020 J	0.14	0 066	0.083
Nitrate (as N)	mg/L	ND(0 20)	ND(0.20)	ND(0 20)	ND(2.0)
Nitrite/Nitrate	mg/L	-	-	-	-
Phenolics (Total)	mg/L	48 J	40	29	29
Thiocyanate	mg/L	1200	50	12000	710
Total Suspended Solids (TSS)	mg/L	ND(10)	ND(100)	ND(10)	ND(10)

APPENDIX I

WEATHER INFORMATION

UNEDITED LOCAL CLIMATOLOGICAL DATA
[NOAA, National Climatic Data Center] MONTH: 10/2000

Station Location: CHICAGO/WAUKEGAN, IL (UGN)lat: 42° 25', lon: -87° 52'
Elev(Ground): 727 Feet Time Zone: WBAN: 14880

date	Temperature (Fahrenheit) Max	Min	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Deg Days Base 65 Degrees Heating	Cooling	Significant Weather	Snow/Ice on Gnd(In) 0600 LST Depth	1200 LST Water Equiv	Precipitation (In) 2400 LST Snow Fall	2400 LST Water Equiv	Pressure (inches of Hg) Avg. Station	Avg. Sea level	Wind Speed=mph Dir=tens of degrees Resultant Speed	Res Dir	Avg. Speed	max 5-sec Speed	Dir	max 2-min Speed	Dir	date
01	82*	61	72*	0	52	60	0	0	-	-	-	-	T	28.96	29.75	16.8	21	16.9	38	20	28	20	01
02	77	51	64	0	54	60	0	0	FG	-	-	-	T	28.90	29.70	8.7	23	10.5	31	23	26	22	02
03	68	46	57	0	52	54	0	0	RA FG	-	-	-	0.84	29.16	29.97	2.0	1	5.5	26	1	17	1	03
04	59	45	52	0	45	50	0	0	FG	-	-	-	0.15	29.25	30.06	8.0	2	8.7	22	1	17	3	04
05	58	45	52	0	46	49	0	0	RA FG	-	-	-	0.34	29.15	29.97	7.7	3	9.9	29	35	23	35	05
06	46	34	40	0	30	37	0	0	-	-	-	-	0.00	29.38	30.22	10.3	30	10 4	26	30	20	31	06
07	48	30	39*	0	27	34	0	0	SN FG	-	-	-	0.05	29.53	30.39	11.2	31	11.6	29	33	20	32	07
08	47	32	40	0	27	33	0	0	-	-	-	-	0.00	29.64	30.50	8.3	32	8.7	25	31	18	34	08
09	57	31	44	0	26	37	0	0	-	-	-	-	0.00	29.53	30.40	6.2	28	7.5	21	29	16	29	09
10	62	34	48	0	28	40	0	0	-	-	-	-	0.00	29.40	30.24	4.2	27	6.5	20	27	13	26	10
11	66	39	53	0	30	43	12	0	-	M	-	M	0.00	29.47	30.30	4.4	25	6.2	17	25	14	23	11
12	72	43	58	5	31	46	7	0	-	M	-	M	0.00	29.41	30.23	10.7	22	11.0	25	21	21	21	12
13	77	52	65	13	45	55	0	0	-	M	-	M	0.00	29.21	30.03	14.0	21	14.1	31	21	25	21	13
14	75	59	67	15	53	58	0	2	-	M	-	M	T	29.12	29.94	9.3	23	10.0	28	22	22	23	14
15	62	41	52	1	49	51	13	0	RA FG+ FG	M	-	M	0.09	29.28	30.09	4.1	2	5.3	20	3	15	2	15
16	58	39	49	0	46	47	0	0	FG+ FG	-	-	-	0.00	29.35	30.18	1.3	5	3.0	9	7	8	7	16
17	59	38	49	0	44	46	0	0	FG+ FG HZ	-	-	-	0.00	29.37	30.19	1.6	35	3.2	12	5	9	6	17
18	70	40	55	5	31	45	10	0	FG HZ	M	-	M	0.00	29.34	30.15	5.5	24	6.9	22	23	15	23	18
19	76	48	62	0	47	54	0	0	-	-	-	-	0.00	29.26	30.09	5.1	22	7.4	22	21	17	21	19
20	76	52	64	0	50	56	0	0	-	-	-	-	0.00	29.18	30.00	10.4	23	11.2	24	22	21	22	20
21	62	49	56	0	49	52	0	0	-	-	-	-	0.00	29.35	30.16	8 4	3	9.5	23	6	17	5	21
22	60	53	57	0	52	54	0	0	FG HZ	-	-	-	0.00	29.56	30.37	5.7	10	6.0	17	10	14	13	22
23	66	56	61	0	59	60	0	0	RA FG HZ	-	-	-	0.15	29.55	30.37	1.3	16	2.3	8	18	7	16	23
24	65	56	61	0	48	55	0	0	FG+ FG HZ	M	-	M	0.00	29.50	30.33	1.9	5	3.5	12	6	10	8	24
25	64	54	59	0	57	57	0	0	FG+ FG HZ	-	-	-	0.02	29.37	30.20	4.6	13	5.4	14	12	12	12	25
26	74	58	66	19	59	61	0	1	RA FG HZ	M	-	M	0.07	29.18	30.00	7.8	20	9.2	26	23	21	22	26
27	71	50	61	14	52	55	4	0	FG HZ	M	-	M	0.00	29.28	30.10	6.1	35	10.7	31	2	23	1	27
28	51	47	49	3	41	45	16	0	-	M	-	M	0.00	29.58	30.40	10.8	6	11.7	25	3	21	3	28
29	53	45	49	3	40	44	16	0	HZ	M	-	M	0.00	29.55	30.38	10.2	11	10.4	22	13	17	13	29
30	58	49	54	8	40	47	11	0	-	M	-	M	0.00	29.42	30.25	10.6	14	10.8	24	14	20	15	30
31	63	54	59	14	44	51	6	0	HZ	M	-	M	0.00	29.35	30.16	6.3	15	6.9	17	16	13	15	31
	63.9	46.2	55.1	———	43.7	49.6	3.1	.1	<Monthly Averages	Totals>			1.71	29.34	30.17	1.6	23.2	8.4	<Monthly Average				
			4.0	———	<——————Departure From Normal——————>								-2.00										

Degree Days

	Monthly Total	Monthly Departure	Season to Date Total	Season to Date Departure
Heating:	311	-127		
Cooling:	10	3		

Greatest 24-hr Precipitation: 0.99 date: 3-4
Greatest 24-hr Snowfall: date:
Greatest Snow Depth: 0 date:

Sea Level Pressure	Date	Time
Maximum:	30.53	8 1943
Minimum :	29.57	2 0337

Number of Days with ---->
Max temp >= 90: 0
Max temp <= 32: 0
Thunderstorms : 0
Min temp <= 32: 3
Min temp <= 0 : 0
Heavy Fog : 5
Precipitation >= .01 inch: 8
Precipitation >= .10 inch : 4
Snowfall >= 1.0 inch : 0

UNEDITED LOCAL CLIMATOLOGICAL DATA
[NOAA, National Climatic Data Center] MONTH: 11/2000

Station Location: CHICAGO/WAUKEGAN, IL (UGN)lat: 42° 25', lon: -87° 52'
Elev(Ground): 727 Feet Time Zone: WBAN: 14880

date	Temperature (Fahrenheit) Max	Min	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Deg Days Base 65 Degrees Heating	Cooling	Significant Weather	Snow/Ice on Gnd(ln) 0600 LST Depth	1200 LST Water Equiv	Precipitation (In) 2400 LST Snow Fall	2400 LST Water Equiv	Pressure (inches of Hg) Avg. Station	Avg. Sea level	Wind Speed=mph Dir=tens of degrees Resultant Speed	Res Dir	Avg. Speed	max 5-sec Speed	max 5-sec Dir	max 2-min Speed	max 2-min Dir	date
01	66*	52	59*	14	49	54	6	0	HZ	M	-	M	0.00	29.21	30.01	11.1	15	11.4	26	14	20	16	01
02	63	49	56	12	48	53	9	0	RA FG	M	-	M	0.08	29.17	29.99	5.8	21	8.1	22	20	16	21	02
03	58	41	50	6	35	43	15	0	-	M	-	M	0.00	29.34	30.16	7.3	26	8.4	26	28	18	28	03
04	56	36	46	2	31	39	19	0	-	M	-	M	0.00	29.26	30.11	3.9	26	6.4	16	26	12	29	04
05	60	37	49	0	35	43	0	0	-	-	-	-	0.00	29.16	30.00	9.8	19	11.1	24	15	18	17	05
06	53	48	51	0	41	46	0	0	RA FG	-	-	-	0.92	28.96	29.78	20.4	14	20.7	37	14	29	13	06
07	56	39	48	0	42	45	0	0	RA FG	-	-	-	T	29.00	29.83	10.5	21	12.3	28	23	23	23	07
08	48	30	39	0	32	36	0	0	-	-	-	-	0.02	29.12	29.96	4.9	25	6.0	21	23	15	23	08
09	41	36	39	0	36	37	0	0	RA FG	-	-	-	1.16	28.81	30.01	10.7	34	11.4	28	33	20	32	09
10	45	31	38	0	31	35	0	0	-	-	-	-	0.00	29.22	30.09	9.8	30	9.8	23	29	16	29	10
11	47	28	38	0	31	36	0	0	FG HZ	-	-	-	0.00	29.43	30.29	2.7	9	5.8	20	10	15	11	11
12	48	43	46	0	38	42	0	0	RA FG	-	-	-	0.01	29.16	29.99	8.9	16	10.0	22	14	16	18	12
13	43	29	36	0	30	33	0	0	RA SN FG HZ	-	-	-	0.13	29.00	29.84	7.5	24	9.4	23	25	18	24	13
14	36	30	33	0	26	31	0	0	SN FG HZ	-	-	-	T	29.06	29.91	11.1	27	11.3	28	26	18	27	14
15	39	22	31	-8	23	29	34	0	-	M	-	M	0.00	29.09	29.95	10.4	23	11.3	24	20	20	21	15
16	42	31	37	-2	30	34	28	0	RA SN FG HZ	M	-	M	0.08	28.83	29.80	10.5	24	12.6	32	26	28	23	16
17	31	27	29	-9	20	26	36	0	FG	M	-	M	0.01	29.21	30.08	8.5	29	9.3	21	30	17	30	17
18	32	21	27	-11	18	24	38	0	-	M	-	M	T	29.22	30.09	9.4	25	11.0	29	25	23	23	18
19	41	21	31	-6	22	27	34	0	SN FG HZ	M	-	M	0.02	28.98	29.85	11.7	23	12.9	31	28	23	22	19
20	31	18	25	-12	18	23	40	0	FG	M	-	M	T	29.14	30.02	13.9	28	14.4	30	30	23	30	20
21	24	14	19*	-17	7	16	46	0	-	M	-	M	0.00	29.41	30.31	9.6	28	10.1	22	30	17	30	21
22	30	16	23	-13	9	18	42	0	-	M	-	M	0.00	29.41	30.31	4.9	31	6.6	20	35	15	31	22
23	35	20	28	-7	17	23	37	0	-	M	-	M	0.00	29.41	30.28	1.8	22	3.6	15	18	14	19	23
24	45	22	34	0	21	28	0	0	-	-	-	-	0.00	29.35	30.19	4.9	21	6.4	18	22	16	20	24
25	45	26	36	0	31	35	0	0	RA FG	-	-	-	0.17	29.08	29.93	7.4	5	7.8	20	7	16	8	25
26	41	37	39	5	-	-	26	0	FG HZ	M	-	M	0.15	28.92	-	7.4	31	7.9	15	31	12	30	26
27	39	29	34	0	30	33	0	0	FG HZ	M	-	M	0.00	29.00	-	6.9	25	8.0	21	23	16	24	27
28	38	27	33	0	30	33	0	0	FG	-	-	-	0.00	29.14	30.00	4.6	27	6.0	17	24	14	31	28
29	37	32	35	0	33	35	0	0	RA SN FG	-	-	-	0.19	29.16	30.01	4.9	28	8.2	21	28	16	31	29
30	36	31	34	2	29	32	31	0	SN FG	M	-	M	0.01	29.43	30.29	3.6	32	4.6	16	32	12	31	30
	43.5	30.8	37.2	———	29.1	34.1	14.7	.0	<Monthly Averages	Totals>			2.95	29.16	30.04	4.5	24.5	9.4	<Monthly Average				
			.0	———	<----------Departure From Normal---------->								-.33										

Degree Days Monthly Season to Date

	Total	Departure	Total	Departure
Heating:	827	700		
Cooling:	0	-94		

Greatest 24-hr Precipitation: 1.18date: 08-9
Greatest 24-hr Snowfall: date:
Greatest Snow Depth: 0 date: -

Sea Level Pressure	Date	Time
Maximum: 30.38	11	0905
Minimum : 29.50	9	1427

Number of Days with ——>

Max temp >= 90: 0	Min temp <= 32: 20	Precipitation >= .01 inch: 13
Max temp <= 32: 5	Min temp <= 0 : 0	Precipitation >= .10 inch : 6
Thunderstorms : 0	Heavy Fog : 0	Snowfall >= 1.0 inch : 0

APPENDIX J

STRATIGRAPHIC DATA SUMMARY REPORT

CONE PENETRATION TESTING WITH SOIL ELECTRICAL CONDUCTIVITY AND UV FLUORESCENCE MEASUREMENTS WAUKEGAN MANUFACTURED GAS AND COKE WAUKEGAN, ILLINOIS

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1.0 INTRODUCTION

STRATIGRAPHICS, The Geotechnical Data Acquisition Corporation, performed cone penetrometer exploration at the Waukegan Manufactured Gas and Coke Plant site in Waukegan, Illinois. Cone Penetration Test with soil electrical Conductivity and UV Fluorescence measurement (CPT-EC-UVF) soundings were performed to provide data on hydrogeologic and geochemical properties of subsurface soils.

The work was performed on July 24, 2000, and totaled about ½ day of field work. Three CPT-EC-UVF soundings were completed to depths of about 40 foot for a total of 119.9 ft of data.

This report includes CPT-EC-UVF sounding logs, and tabulations of recorded data and correlated geotechnical parameters. Details of penetrometer exploration techniques are included in the main body of the report, both for this study and for penetrometer uses in general.

2.0 PENETROMETER EQUIPMENT AND DATA ACQUISITION

2.1 Procedure The Cone Penetration Test (CPT) consists of smoothly and continuously pushing a small diameter, instrumented probe (penetrometer) deep into the ground while a computer data acquisition system displays and records the soil response to penetration (Figure 1). In geotechnical terms, the CPT penetrometer models a foundation pile under plunging failure load conditions. CPT data are used to develop continuous, high resolution profiles of in situ soil conditions rapidly, accurately and economically.

The soil resistance to penetration, acting on the tip and along the sides of the penetrometer, is measured during CPT (Figure 1a). CPT soil resistance measurements are accurate and highly repeatable. The measurements can be used for the evaluation of stratigraphy and various geotechnical parameters. Performance of CPT is specified by ASTM Standard D3441.

A pressure transducer is added to the CPT penetrometer to acquire hydrogeologic data (Saines and others, 1989) and is called a Piezometric Cone Penetration Test (CPTU). A soil electrical conductivity sensor is added to the penetrometer (CPTU-EC) to acquire qualitative moisture information in vadose zone soils, and general groundwater quality data (Strutynsky and others, 1991, 1998). Penetrometer groundwater, soil, and soil gas samplers are used for direct sampling (Strutynsky and Sainey, 1990, Strutynsky and others, 1998). Recent advances in penetrometer instrumentation include a natural gamma sensor, induced UV fluorescence for detection of hydrocarbons and other compounds, and shear wave velocity and stress controlled testing for low and high strain soil deformation evaluation.

The penetrometer is mounted at the end of a string of sounding rods. A hydraulic ram is used to push the penetrometer and rod string into the ground at a constant rate of 4 ft per minute. Electronic signals from the downhole sensors are transmitted by a cable, strung through the sounding rods, to the computer data acquisition system. Measurements are displayed and recorded for immediate definition of subsurface conditions. Downhole equipment can be automatically steam cleaned during retrieval at the end of a test. Open hole can be grouted using a bentonite clay grout.

Large 3 axle trucks are used to carry the 2 penetrometer systems used by STRATIGRAPHICS. Truck weight and ballast serve to counteract the thrust of the hydraulic ram. The enclosed rig work area allows all-weather operations. Computers, samplers, electrical power, lighting, compressed air, steam cleaner, grout pump, and water tank are all included on each rig, providing for self-contained operations. Other systems for mounting on drill rigs can be used in areas with poor access or for overseas projects.

Lightning detection systems are mounted on the rigs to monitor dangerous weather conditions, that can affect safety and productivity. STRATIGRAPHICS is currently in the process of mounting differential, carrier phase, post processed Global Positioning Systems (GPS) on its rigs, to allow surveying exploration points to an accuracy of about 5 to 15 cm.

No borehole is required during exploration because penetrometers are directly thrust into the soil from the ground surface. Pressures of over 3 million pounds per square foot can be applied to the tip of the penetrometer for penetration of most soils finer than medium gravel. Asphalt pavements up to 6 inches thick can usually be penetrated by penetrometer methods without predrilling. Site disturbance is reduced since no borehole cuttings or drilling fluids are generated during penetrometer operations. Personnel exposure to possibly contaminated soil is significantly less than exposures during drilling and sampling operations. Penetrometer downhole equipment is readily decontaminated during retrieval, when contaminated soils are encountered .

Four hundred to thirteen hundred feet of CPT (with no time dependent piezometric, gamma or shear wave velocity measurements) can be performed in one day, depending on site access. Depths of more than 180 ft can be achieved, depending on site stratigraphy. Where soils are exceptionally dense or gravelly, a uninstrumented prepunch tool can be used to probe the subsurface. Information obtained using the prepunch tool can be similar to that obtained during mechanical (Dutch) cone testing, especially where friction on the sounding rods is minimal. Dynamic driving can be used in conjunction with the thrust of the hydraulic ram to aid in prepunching of very dense or gravelly soils.

2.1.1 Signal Conditioning and Recording CPT data are acquired using a 16 bit (resolution of 1 part in 32,768) analog to digital data logger and field computer. Test data are graphically displayed for immediate evaluation of subsurface conditions. Field sounding logs are provided at the end of each test. Data are recorded on disk for data processing and long term storage.

2.2 Soil Shear Resistance Measurements The resistance of a soil to penetration is measured on the tip and along the sides of the CPT penetrometer (Figure 1a). The conical tip of the penetrometer has a projected cross-sectional area of 15 square centimeters (2.3 square inches), and a diameter of 1.7 inches. The soil resistance acting on the cone tip reflects the deep bearing capacity of a soil, and is termed cone end bearing or tip resistance. The friction between the soil and the penetrometer is measured along a cylindrical sleeve mounted behind the cone tip. The sleeve has a surface area of 200 square centimeters (31.0 square inches), a length of 5.8 inches, and a diameter slightly larger than the cone tip. The soil friction measurement is termed friction sleeve resistance. Two strain gage loadcells are used to measure the tip and sleeve resistances (Strutynsky and others, 1985). The tip measurement has a resolution of about 2 to 4 inches. The sleeve measurement has a resolution of about 6 inches.

2.3 Piezometric Measurements A fluid pressure transducer is used to measure the soil pore water pressure response to penetration. The CPTU piezometric measurement has a layer detection limit of about 1 inch and an accuracy of about +/- 0.5 ft of water pressure. The advance of the penetrometer causes a volumetric distortion of the soil, which generates a local water pressure field. These local generated pressures dissipate almost instantaneously in soils of high permeability, so equilibrium water pressures are measured during CPTU in coarse sand and gravel. In medium or low permeability soils, the generated water pressure field is sustained for a lengthy period of time (Saines and others, 1989).

The dissipation of generated water pressure can be recorded during pauses in the penetration process. If the pauses are long enough for all generated water pressures to dissipate, potentiometric surface measurements can be obtained at multiple depths in a single CPTU sounding. The dissipation test is also used to estimate soil hydraulic conductivity and consolidation characteristics.

2.3.1 Piezometer Saturation The CPTU piezometer filter is saturated with an incompressible liquid so that instantaneous responses (zero lag time) can be achieved during testing. High saturation levels are indicated by sharp responses at interfaces and immediate regeneration of excess water pressure after pauses in penetration. Low saturation levels leading to poor measurements can be caused by inadequate equipment preparation, soil suction, or filter damage on coarse soil particles. Clogging of piezometric filters by clay particles also can lead to poor results. Loss of filter saturation or clogged filters are beyond the control of the penetrometer system operator. Thus, the piezometric measurements can be less repeatable than the highly repeatable CPT tip and sleeve measurements.

2.4 Electrical Conductivity and Thermal Measurements A CPTU-EC penetrometer including tip, sleeve, piezometric, temperature, and electrical conductivity (EC) sensors can be used to simultaneously acquire geotechnical, hydrogeological and qualitative geochemical information. Soil EC is measured using a two electrode array, energized with a 3 kHz signal, mounted on the penetrometer tip. The EC measurement has a resolution of about 0.75 inches.

A thermal sensor can be mounted inside the penetrometer. Significant frictional heating occurs when penetrating sandy soils. During pauses, the generated heat will dissipate and the penetrometer will reach thermal equilibrium with the soil. This allows a soil temperature profile to be acquired.

2.5 Natural Gamma Measurements A CPTU-ECG penetrometer incorporating cone, friction, piezometric, soil electrical conductivity and natural gamma (G) sensors can be used to simultaneously acquire geotechnical, hydrogeological, qualitative geochemical and radiological information. Gamma measurements can be used to enhance lithologic interpretation. Radionuclide contamination can also be detected using gamma logging.

2.6 UV Fluorescence A CPTU-EC-UVF penetrometer incorporating cone, friction, piezometric, soil electrical conductivity, and UV Fluorescence (UVF) sensors can be used to simultaneously acquire geotechnical, ..drogeological, and qualitative geochemical information. The UVF system consists of a sapphire window in ..ie penetrometer, a UV excitation light source, and photonic sensors. UV light is transmitted through the window into the adjacent soil. If the soil contains compounds such as petroleum hydrocarbons that fluoresce, the resulting light can be detected.

The UV source light is bandpass filtered to provide an excitation wavelength of 254 nm. The photonics sensor is filtered to monitor resulting fluorescence emissions above 290 nm. Future improvements to the UVF module include a photonic sensor array, filtered at several different wavelengths to allow some compound differentiation capabilities.

2.7 CPT Shear Wave Velocity Measurements A geophone module is deployed similarly to other penetrometer sensors. A main advantage of the pushed in sensor is that it has superior coupling to the soil, resulting in much better definition of wave arrival, as compared to borehole deployed geophones. The shear wave system consists of a pair of downhole geophones, an uphole wave source and timing trigger, signal conditioning and A/D, signal enhancement and acquisition software, and a PC computer.

The CPT shear wave velocity data acquisition procedure is as follows: 1) the geophone module is pushed to the required depth; 2) data file/signal conditioning is initialized; 3) a hammer/timing trigger is used as enhance the picking of wave arrival times. The procedure is repeated at multiple depths, to allow calculation of interval wave velocities between adjacent tests.

2.8 CPT Load/settlement Measurements The standard CPT procedure is typically conducted as a constant rate a uphole wave source; 4) geophone signal is monitored for wave arrival. The software allows signal stacking to of strain test, resulting in continuous measurements of soil ultimate bearing and frictional strengths. By conducting CPT under monotonically increasing stress conditions, soil deformation properties can be evaluated. The procedure is very similar to pile load testing except that no pile "set up" is typically allowed - the CPT test is conducted during short pauses in the continuous push process.

..9 Penetrometer Geometry The CPT penetrometer external geometry is specified by ASTM standards. Differences in penetrometer internal design can lead to some variability in response between penetrometers of different manufacture, especially in very soft clays. The CPTU measurement of generated water pressure depends on external filter geometry. Measurements of equilibrium water pressures after pauses in the penetration process are not sensitive to geometry, and reflect undisturbed conditions. CPTU piezometric filters are typically mounted on either the cone tip or just ahead of the friction sleeve. Each position has advantages and disadvantages. Measurements taken with the cone tip filter are at a maximum and show high resolution of thin soil seams. The cone tip filter is prone to damage on coarse soil particles.

Negative pressures are often measured in dense, silty or clayey sands and hard clays when using the friction sleeve filter. These low pressures are caused by soil elastic rebound (expansion) as the soil moves from the intensely loaded region beneath the cone tip to the less loaded region next to the friction sleeve. Soil expansion can induce large suction forces on the friction sleeve filter, which then often results in decreased filter saturation levels.

Site characteristics and data usage determine which piezometric filter geometry is appropriate. The piezometric filter is placed at the friction sleeve position on the CPTU-EC penetrometer. Generally good results can be obtained using this geometry when proper preparation techniques are followed.

2.10 Downhole Equipment Decontamination and Open Hole Grouting The rod string is retrieved through a rodwasher mounted on the hydraulic ram assembly. High pressure hot water is sprayed from internal nozzles to clean the rod string. Wash water (½ gallon per 10 ft of rod) can be captured for disposal.

The STRATIGRAPHICS grouting system is used to seal open hole. As penetrometers are being advanced, bentonite grout is pumped into the annular space between the smaller diameter sounding rods and the soil formed by the passage of the larger diameter penetrometer. A bypass valve is opened and additional grout is pumped to seal the hole during rod string retrieval. About 3/4 gallons of grout are required to seal 10 ft ` open hole.

Pressure grouting during sounding advance controls cross-contamination between different strata. The grout decreases the contact of downhole equipment with contaminated soil. The grout also can decrease friction ' the sounding rods, which can allow deeper penetration. Grout levels are checked after completion, a additional grout is added to account for penetration of grout into permeable strata.

3.0 PENETROMETER SAMPLING EQUIPMENT

Groundwater, soil gas, and soil samplers are deployed in the same manner as CPTU-EC penetrometers. Good sample isolation is achieved because no open hole exists during penetrometer operations.

3.1 Groundwater Sampler The STRATIGRAPHICS groundwater sampler is a shielded wellpoint sampler of heavy construction. The shield prevents sampler contamination while penetrating soils above the sampling depth. After shield retraction, groundwater flows under in situ pressure conditions, through a 20 inch long screen, into the 350 ml sample barrel. The sampler is retrieved to pour off the sample and for decontamination. Small diameter pumps can be used with the sampler to acquire large volumes of sample. This sampler can be deployed in any soil capable of being penetrated by the CPTU-EC penetrometer (Strutynsky and others, 1998).

A pressure transducer can be placed inside the sampler barrel. This allows the measurement of sample inflow rate. Analysis of inflow data using rising head slug test methods can provide a means of estimating soil hydraulic conductivities. If equilibrium conditions are reached, a measurement of the static water pressure head is obtained during groundwater sampling.

3.2 Soil Gas Sampler The STRATIGRAPHICS soil gas sampler is a shielded screen sampler, similar to the groundwater sampler. The shield is opened by pulling back the rod string during sampling, and soil gases are then extracted. The shield can be closed, and the rod string advanced to another depth, allowing multiple samples during a single rod trip. Soil gasses are extracted from the rod string. A vacuum box can be used to inflate Tedlar bags for off site analysis. Portable analytical equipment can be used to allow immediate analysis. The sampler, rod string and tubing are purged before sampling.

3.3 Soil Samplers Fixed piston samplers are used to obtain soil samples during penetrometer exploration. T STRATIGRAPHICS and MOSTAP 2-meter samplers are deployed similarly to a penetrometer. A piston, locked into the tip of the barrel to prevent soil from entering the sampler prematurely, is released at the sampling depth. The barrel is then advanced to the bottom of the sampling interval. The soil enters the liners within the barrel and is retained by a core catcher. The sampler is retrieved to remove the sample and for sampler decontamination.

The MOSTAP Sampler is used to obtain 1 inch diameter samples as long as 2 meters (78 inches). This sampler incorporates a PVC liner and a nylon stocking to allow retrieval of such a long sample. As the sample enters the sampler, it is encased in the nylon stocking. The stocking lessens soil friction around on the sample as it enters the PVC liner. At the end of the 2 meter run, the sampler is rotated to twist the stocking, helping retain the sample. This sampler can be used in softer soils.

4.0 PIEZOMETER INSTALLATION TECHNIQUES

Penetrometer methods can be used to install piezometers for water level measurements, slug testing, groundwater sampling, and for remediation activities, such as sparging and soil vapor extraction (SVE). Various installation techniques are available (Saines and others, 1989). Proprietary, low volume change piezometers also can be installed using penetrometer equipment. These piezometers are often used for long term water pressure measurements during geotechnical projects.

PVC piezometers can be installed using either of two techniques. The simplest is to lower 3/4 inch PVC screen and riser into the open hole left after penetrometer retrieval. Installation and material costs are very low for this technique. A drawback is that caving sands or squeezing clays can limit the depth to which the PVC pipe can be lowered.

PVC piezometers also are most often installed using a steel casing pushed to depth. The steel casing is sealed with an expendable tip, which prevents soil from entering the casing during deployment. The PVC screen and risers are lowered into the casing. The steel casing is then withdrawn, leaving the expendable ti and PVC piezometer in place.

5.0 DATA REDUCTION

Test data are monitored as the soundings are performed. Data are recorded on hard disk and may consist of: ›th, time, tip and sleeve resistance, generated water pressure, EC, UVF, temperature and natural gamma.. _ ata are processed in-house for final reporting. Before final reporting, data pass a quality control review. Routine checking of proper equipment performance is conducted in the field. Office review helps assure that data quality is maintained throughout the study.

Several parameters can be computed to enhance data correlation:

friction ratio, FR (in %):

FR = fs/qc * 100 (Eq. 1); and

pore pressure ratio, Bq (dimensionless):

Bq = (U-Ue)/(qc-Sv) (Eq. 2);

where: fs is the measured friction sleeve resistance, in TSF;
qc is the measured cone end bearing resistance, in TSF;
U is the measured generated pore water pressure, in TSF;
Ue is the measured or estimated equilibrium pore water pressure, in TSF; and
Sv is the total soil overburden pressure, in TSF.

Measured data and correlated parameters are presented in a graphical sounding log format for each sounding; numerical data are typically tabulated at 0.5 ft intervals. Tabulated digital data in ASCII real format are attached on 3-1/2 inch, 1.44 M floppy disk.

CPTU dissipation test data are recorded as a function of time during pauses in the penetration process. The CPTU dissipation data are normalized using the following equation:

normalized dissipation level, U* (dimensionless):

(Ut - Ue) / (U0 - Ue) (Eq. 3);

where: Ut is the excess pore water pressure at time t, in TSF;
Ue is the measured or estimated equilibrium, undisturbed pore water pressure (in situ pore water pressure before penetrometer insertion), in TSF; and
U0 is the excess pore water pressure at time equal to zero, at the start of the dissipation test, in TSF

The normalized dissipation level is plotted versus log scale time. In uniform soils, the plot takes the shape of a reverse S-curve, beginning at 1.0 at zero time (at the instant the penetration process is stopped) and falling to 0.0 when equilibrium pressures are achieved. Boundary effects in interbedded deposits can cause deviation from this ideal.

An estimate of the horizontal coefficient of soil consolidation can be calculated (Baligh and Levadoux, 1980) using:

Ch (in cm**2/sec) = (r**2*T)/t (Eq. 4a).

Estimates of soil hydraulic conductivity in the horizontal direction can be calculated using:

kh (in cm/s) = ((r**2*T)/t)*RR*(Gw/(2.3*Sv')) (Eq. 4b);

where: r is the penetrometer radial dimension at the plane of the piezometric filter, equal to 2.2 cm for the friction sleeve filter and 1.9 cm for the cone tip filter;
T is a dimensionless time factor at the 50% normalized dissipation level, equal to 5.5 for the friction sleeve filter and 3.8 for the cone tip filter;
t is the measured time, in seconds, at which the normalized dissipation level is 50%;
RR is a dimensionless soil compressibility parameter;
Gw is the unit weight of water, in kg/cm***3; and
Sv' is the effective soil vertical overburden pressure, in kg/cm**2.

Dissipation test data can be presented in graphical plots and are summarized in tabular form.

6.0 GENERAL DATA EVALUATION

6.1 Sounding Log The CPTU-EC sounding logs provide high resolution information on subsurface conditions. Soil layering is often highly apparent. Soil relative strength and saturation levels can also be evaluated. Zones anomalous soil electrical conductivity can readily be identified. Lateral continuity of conditions can be veloped by overlaying adjacent sounding logs on a light table and comparing layer characteristics for similarities. Digital CPTU-EC data files can be used in two and three dimensional data visualization or CAD software programs.

6.2 Soil Type Classification Correlations between penetrometer data and soil classification have been developed from geotechnical bearing capacity theory and a relational database on adjacent CPT soundings and drilled boreholes (Douglas and Olsen, 1981). A CPT soil classification chart based on cone tip resistance and friction ratio is presented in Appendix A.

The CPT tip resistance increases exponentially with soil grain size. For example, tip resistance in dense sands ranges from about 100 to 400 tons per square foot (TSF), while tip resistance in a stiff clay ranges from about 5 to 15 TSF. The friction ratio (Section 5.0) is also used for indication of soil type. The friction ratio increases with the fines content and compressibility of a soil. The friction ratio is less than about 1% in a sand and greater than about 3% in a clay.

Correlated CPT soil classifications reflect the soil shear resistance to penetration. Soil shear resistance is not entirely controlled by grain size distribution. However, correlated CPT classifications generally agree with classifications based on grain size distribution methods, such as the Unified Soil Classification System (USCS).

The generated water pressure measurement may be useful for classification of saturated soils. Penetration of coarse sand and gravel occurs under drained loading conditions, and equilibrium pressures are measured during penetration. The pore pressure ratio (Section 5.0) is zero in high permeability soils.

For saturated soils of permeability less than about 1*10E-2 cm/sec, undrained loading with significant excess water pressure generation occurs during CPTU. Positive excess water pressures are generally measured during penetration of silt or clay soils when using either the cone tip or friction sleeve filter penetrometer (Section 2.7). Pore pressure ratios of fine grained soils typically range from about 0.4 to 1.0.

Positive excess water pressures are also usually measured in dense, silty or clayey sands when using the cone tip filter penetrometer, with pore pressure ratios from about 0 to 0.3. Due to geometric effects (Section 2.7), negative pressures are usually measured in dense, silty or clayey sands, sandy silts, or hard sandy clays with the friction sleeve filter penetrometer. Thus, it is important to note the type of piezometer in use. The CPTU-EC penetrometer uses a friction sleeve piezometric filter.

6.3 Potentiometric Surfaces Equilibrium water pressures are measured during penetrometer advance in saturated, coarse sands and gravels. Measurements of equilibrium water pressures can be obtained during CPTU in lower permeability soils by pausing during penetration and allowing generated water pressures to dissipate to equilibrium conditions.

6.4 Soil Saturation Soil saturation can be evaluated by inspection of the CPTU sounding log. Atmospheric (zero) pressure is measured during CPTU in unsaturated soils. Hydrostatic pressures are measured in saturated, high permeability soils. Significant water pressures are generated in saturated, low permeability soils due to penetrometer advance. Decreased levels of water pressure generation can be indicative of partially saturated soils. Decreased water pressure generation also may occur in organic soils due to the high compressibility of organic soil particles and the presence of biogenic gases, such as methane and hydrogen sulfide.

6.5 Soil Hydraulic Conductivity Excess water pressures are generated by penetrometer advance in saturated soils with permeability of less than about 1*10E-2 cm/sec. These pressures can be allowed to dissipate during pauses in the penetration process. The CPTU dissipation test is similar to a falling head slug test and can be used to estimate soil hydraulic conductivity in the horizontal direction. Very high water pressures are typically generated in low permeability soils by penetrometer advance. The large water pressure changes require soil compressibility (storage) effects to be included in analyses. The CPTU tip resistance provides an index of soil compressibility for these computations (Section 5.0).

6.6 Soil Electrical Conductivity Behavior Soil electrical conductivity (EC) is controlled by the conductance of both the soil particles and soil pore fluids. The ratio between pore fluid and soil-pore fluid electrical conductivity is termed the formation factor (Archie, 1942). Clays can be electrically conductive due to adsorbed water and ionic electrical charges on the clay platelets. Clay EC depends on mineralogy, porosity and pore fluid characteristics. Sand grains are typically non-conductive, so granular soil conductance is primarily dependent on the conductance of pore fluids and the sand's porosity. The following factors affect granular soil EC: **Pore fluids** Pore fluids play a major role in sand EC. A dry sand has low conductance since both the sand grains and the air in the pore space have very low EC. Sands saturated with conductive liquids, such as brine or landfill leachates, have high electrical conductivity. Hydrocarbons typically decrease EC because of their low conductance.

Saturation Soil saturation has a pronounced effect on soil EC, as conductance increases with water saturation. Low saturation is typically associated with low EC.

Porosity The low porosity of a dense sand results in less pore fluid available for electrical conductance and thus lower EC; the high porosity of a loose sand is associated with higher EC. Formation factors vary as an inverse function of porosity, from about 3 at high porosity to about 4.5 at low porosity.

Clay content The addition of as little as 5% clay to a sand can significantly increase soil electrical conductance (Windle, 1977).

Gravel Interference The high resolution of the STRATIGRAPHICS CPTU-EC electrode array makes measurements sensitive to soil grain size. Two behaviors can occur when penetrating gravelly soils. One can occur when a large particle is crushed against an electrode, masking it from the pore fluids, which results in very low EC values. This can result in false positive hydrocarbon interpretations. An opposite behavior is observed in gravel deposits which contain few fine grained, intersticial soils. The resolution of the EC measurement is so high that electrical conductance paths are often entirely within the pore fluid of the coarse grained soil. In this situation, high EC values are measured, more closely reflecting pore fluid EC, rather than soil EC.

6.7 EC Evaluation EC data are evaluated for qualitative geochemical characteristics in conjunction with piezometric data and soil types. Anomalous zones possibly indicative of contaminants can be directly sampled for quantitative chemical analysis.

Vadose Zone Low or zero EC values are measured in dry sandy soils. Increased EC in sands above the water table may indicate moisture infiltration. Low EC data in silty or clayey soils can be anomalous as fine grained soils often retain significant amounts of moisture within their pore spaces, creating good conditions for electrical conductance. Thus, low EC values in silty or clayey soils in the vadose zone may indicate hydrocarbon contamination. Elevated EC values in the vadose zone may be associated with road deicing salts, buried metals and rusted metal objects, flyash and cinders, among others.

Saturated Soils Low EC values in saturated soils can be indicative of anomalous geochemistry. In particular, depressed EC zones immediately at the water table may be associated with floating (LNAPL) compounds. Very low EC zones at interfaces between aquifers and aquitards may be associated with either floating (LNAPL) or sinking (DNAPL) compounds. Gravel interference must be considered when evaluating depressed EC zones in saturated soils.

Elevated EC values in saturated soils can be due to increased soil clay content or to increased dissolved salts in the ground water. Increased clay contents are evaluated based on the CPTU-EC piezometric data and soil type information. Zones of elevated EC immediately above an aquiclude may be associated with brines (Strutynsky and others, 1998).

6.8 UV Fluorescence Behavior Fluorimetry (measurement of fluorescence) has been used for many years for the detection and identification of various compounds and minerals. An excitation light of short wavelength is used to expose the specimen. If fluorescent compounds or minerals are present, light of longer wavelength, as compared to the excitation wavelength, will be emitted from the specimen. This resulting light can be monitored for intensity and spectral distribution.

Compounds that fluoresce include a wide range of hydrocarbon and other organic compounds. Heavy hydrocarbons (e.g. fuel oil and coal tars) fluoresce at relatively long wavelength excitation. As excitation wavelength decreases below about 300 nm, fluorescence from lighter hydrocarbons (e.g. jet fuel and gasoline) is observed. In addition to hydrocarbons, other compounds and minerals, such as fluorites and other carbonates, also exhibit fluorescence. Compounds that fluoresce include dyes and optical brighteners. Dyes and brighteners can be found in paints, detergents, antifreeze compounds, some food additives and cosmetics, among others. UVF response will be affected by the presence of any such compounds.

6.9 CPT-SPT Correlation Since most geoscientists are familiar with drilling and split spoon sampling, CPT data have been correlated with SPT blowcount N-values. The SPT N-value is defined by ASTM to be the number of blows of a 140 lb hammer, dropped 30 inches, required to drive a 2 inch outside diameter sampler 12 inches into the bottom of the borehole, after an initial seating drive of 6 inches. Correlations of CPT to the crude SPT have been based on numerical modeling of the two penetration processes and on side by side comparisons (Douglas and others, 1981). Details on CPT-SPT correlations are included in Appendix A

7.0 OPTIONAL GEOTECHNICAL DATA CORRELATION

CPT data have been correlated with soil type, drained friction angle, undrained shear strength, relative density and SPT blowcounts, among others. A correlation scheme including tip resistance and friction ratio ha generally proved most useful for evaluating CPT data. Correlation of CPT data with other parameters has be developed using: 1) comparisons between CPT data and results of other in situ and laboratory tests in adjacent boreholes; 2) CPT testing on large scale soil samples of known composition; and 3) geotechnical bearing capacity and cavity expansion theory. Site specific information can be used to fine tune correlations. Additional information on correlation techniques, including overburden pressure normalization, test drainage conditions and recommended practices, is presented in Appendix A.

8.0 PROGRAM RESULTS

Acquired data are presented following the report text and consist of: 1) sounding logs with lithologic evaluation; 2) data presentation sounding logs; and 3) tabulations of correlated geotechnical parameters, including soil classifications.

It should be noted that the computerized correlations of soil types and other geotechnical properties were generated using a global rather than site specific data base. Use of site specific data was beyond the scope of this study.

9.0 STATEMENT OF LIMITATIONS

Subsurface information was gathered only at the sounding locations. Extrapolation of sounding data to develop stratigraphic continuity is conjectural. Actual site conditions between sounding locations may differ.

Computer correlation of penetrometer data with other parameters was performed using generalized charts rather than on site specific information. Site specific correlation work based on results of detailed laboratory testing was beyond the scope of this project. Evaluation of soil saturation levels and potentiometric surfaces is only representative of conditions encountered during the field program. Seasonal variation must be expected.

Data gathering for this study was attempted to be performed in general accordance with accepted procedures and practices. Correlation of penetrometer data with other parameters is empirical and should no be considered as the exact equivalent of laboratory testing. STRATIGRAPHICS shall not be responsible f another's interpretation of the information obtained for this study.

10.0 REFERENCES

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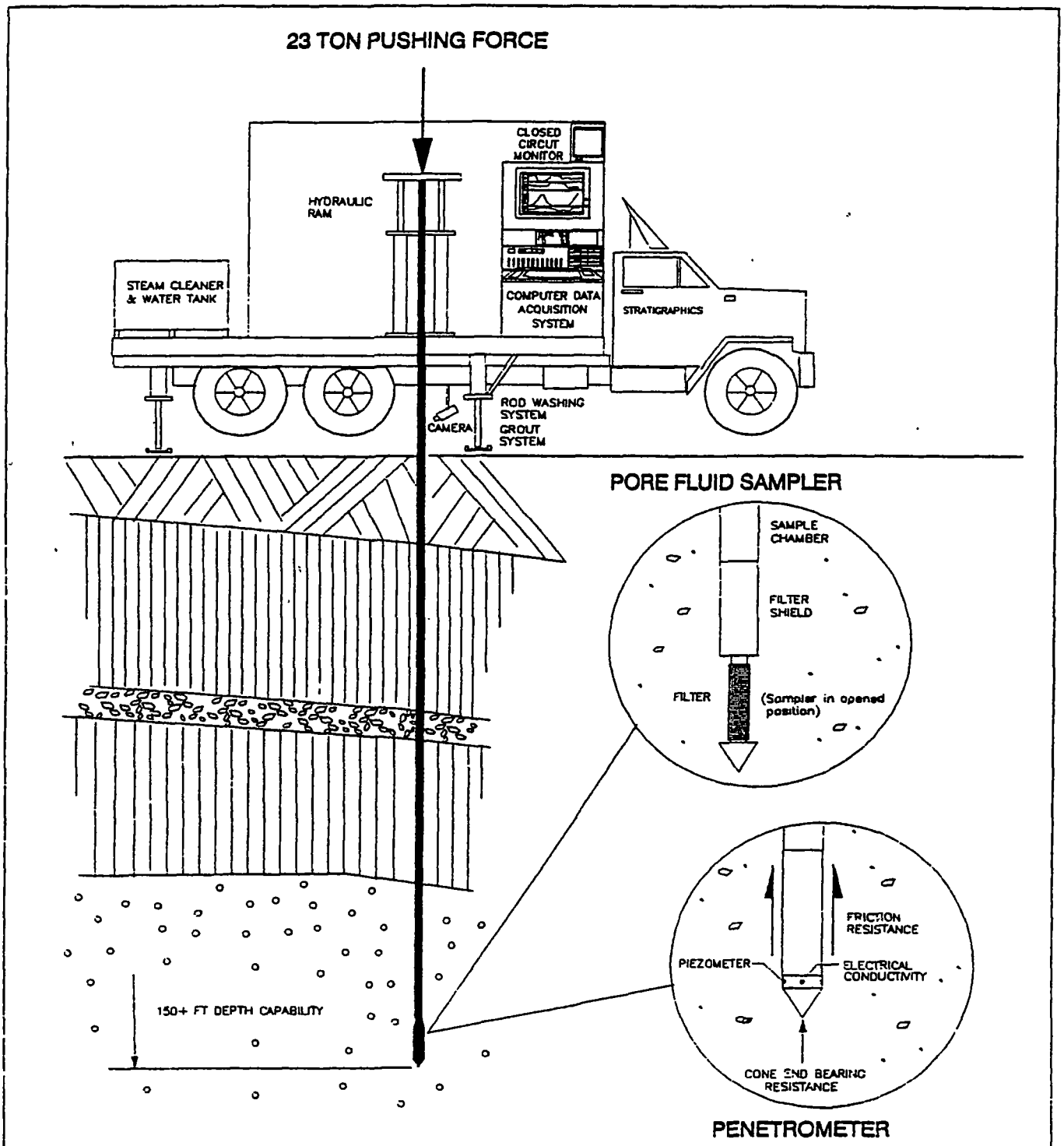
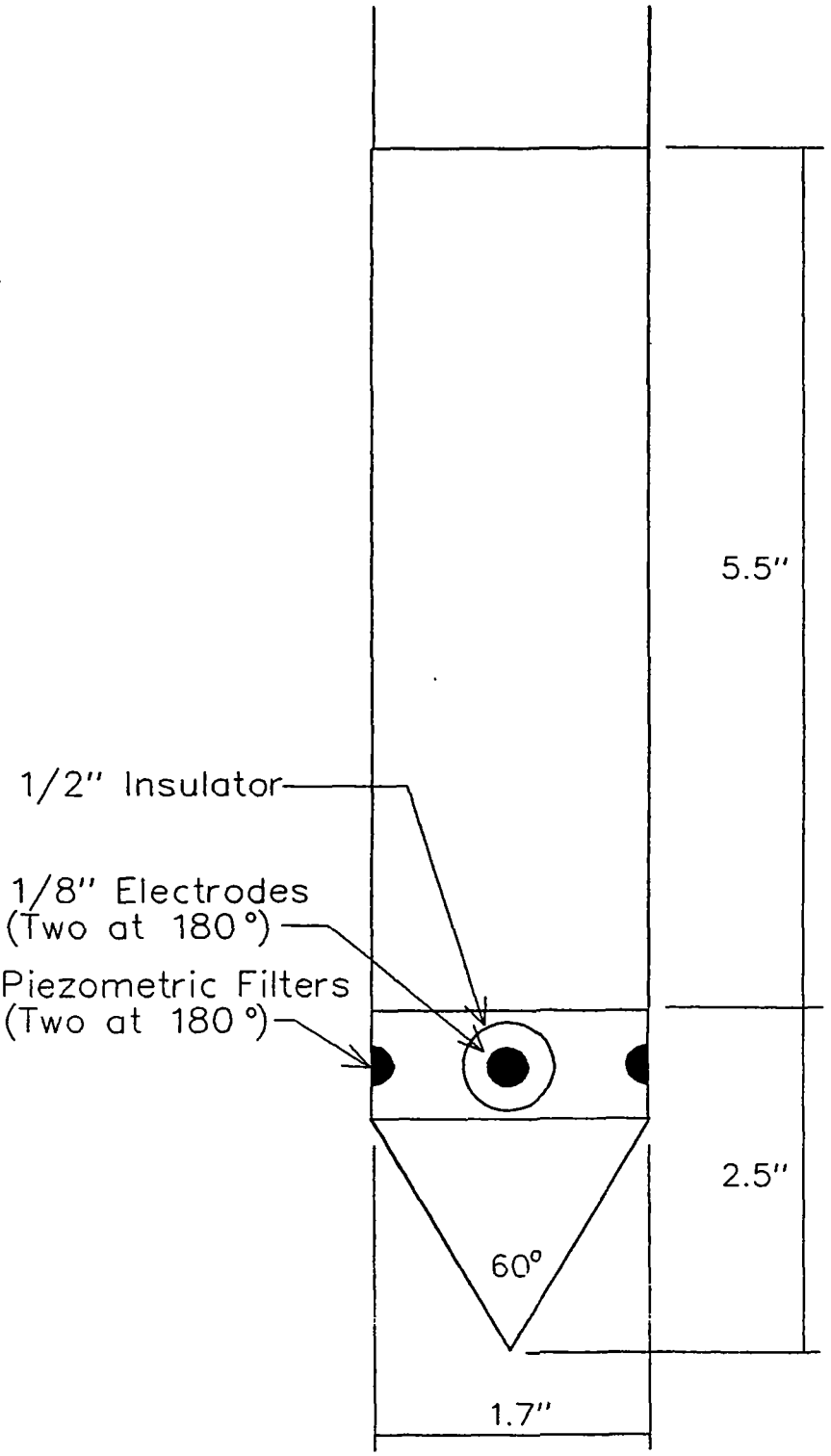


PENETROMETER SUBSURFACE EXPLORATION SYSTEM

STRATIGRAPHICS



NOTE:

1. All dimensions approximate.

STRATIGRAPHICS

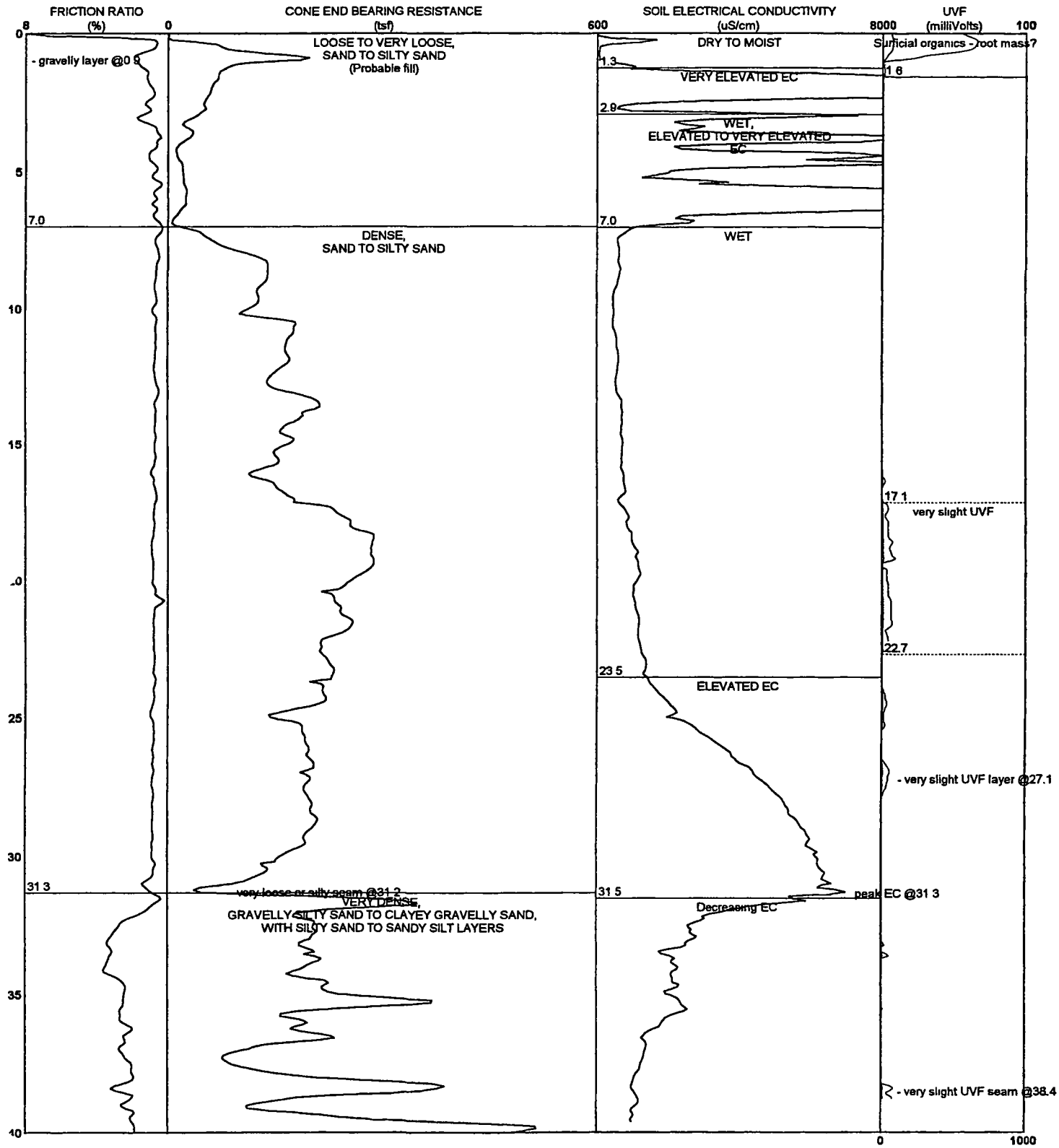
PENETROMETER FOR CPTU-EC TESTING

Figure 1a

TABLE 1
SUMMARY OF CPT-EC-UVF SOUNDINGS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

SOUNDING NUMBER	DATE PERFORMED	SOUNDING TYPE	SOUNDING DEPTH (feet)	COMMENTS
CP-001	07/24/00	CPT-EC-UVF	40.0	
CP-002	07/24/00	CPT-EC-UVF	39.9	
CP-004	07/24/00	CPT-EC-UVF	40.0	

CPT-EC-UVF LOG WITH LITHOLOGIC EVALUATION

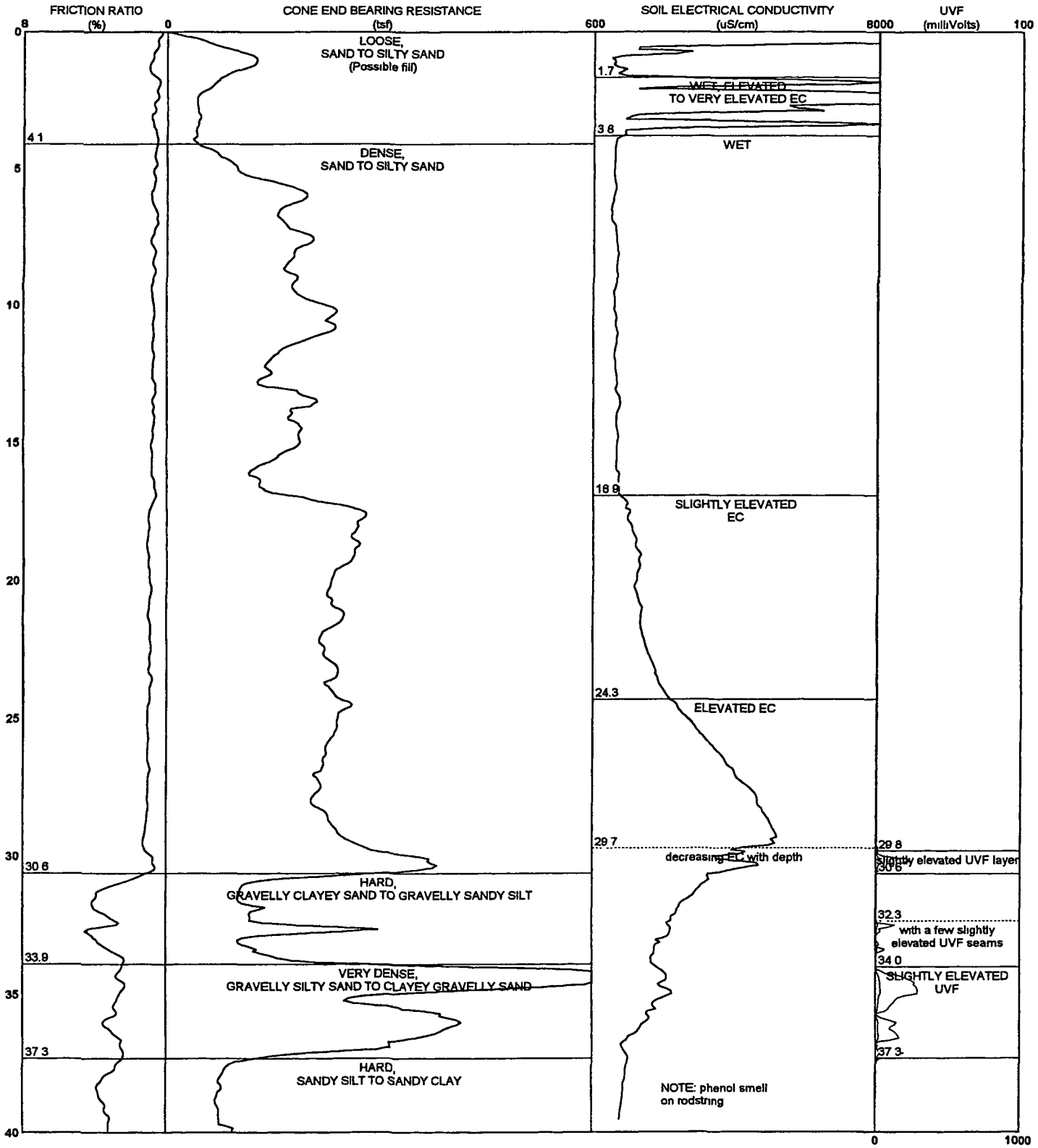


PROJECT NAME:WCP Site
PROJECT NUMBER 00-120-080

STRATIGRAPHICS

DATE: 7-24-2000 TIME:09.23.10 54
SOUNDING NUMBER:CP-001

CPT-EC-UVF LOG WITH LITHOLOGIC EVALUATION

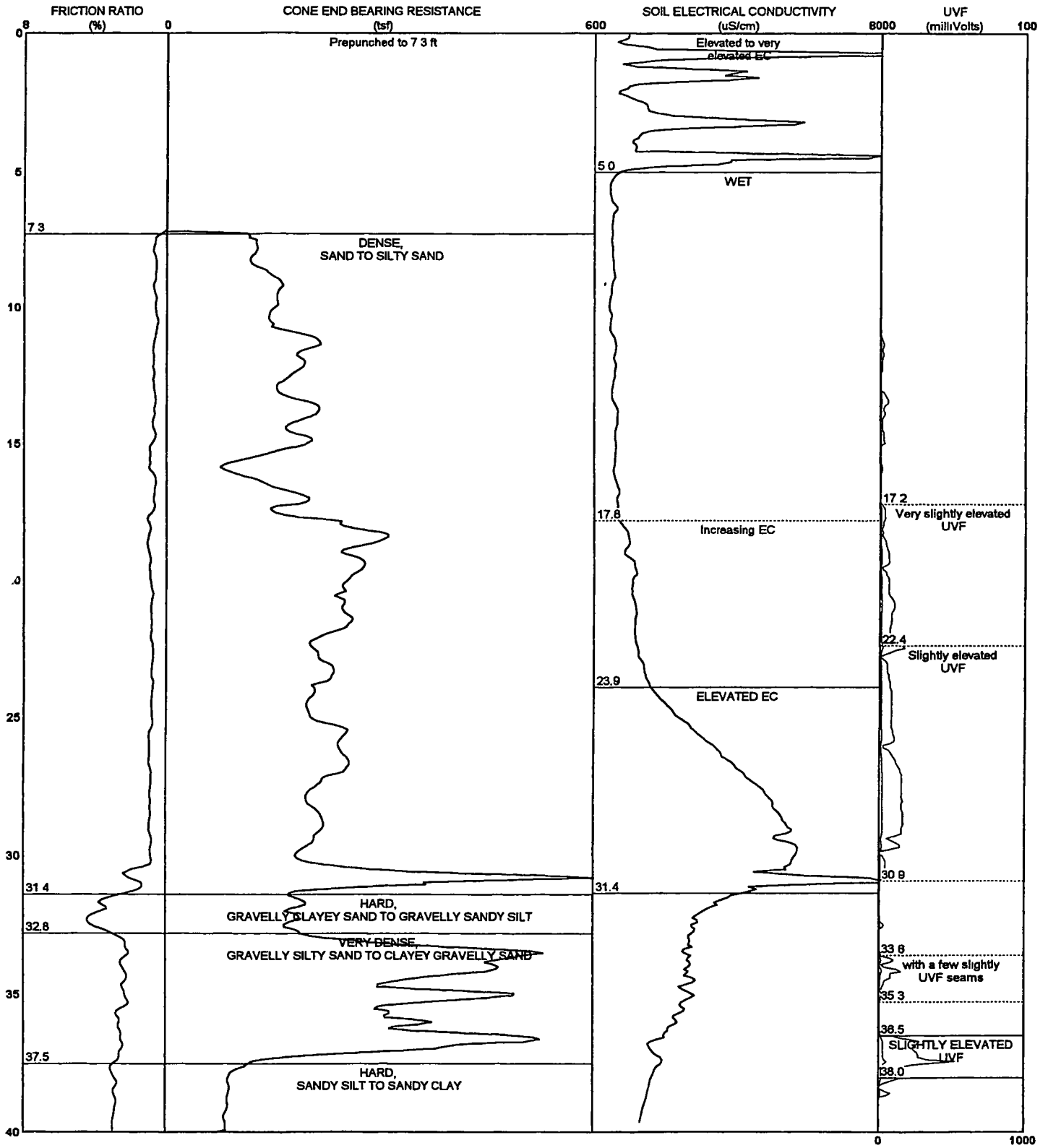


PROJECT NAME WCP Site
PROJECT NUMBER 00-120-080

STRATIGRAPHICS

DATE: 7-24-2000 TIME: 10:36:16.29
SOUNDING NUMBER CP-002

CPT-EC-UVF LOG WITH LITHOLOGIC EVALUATION

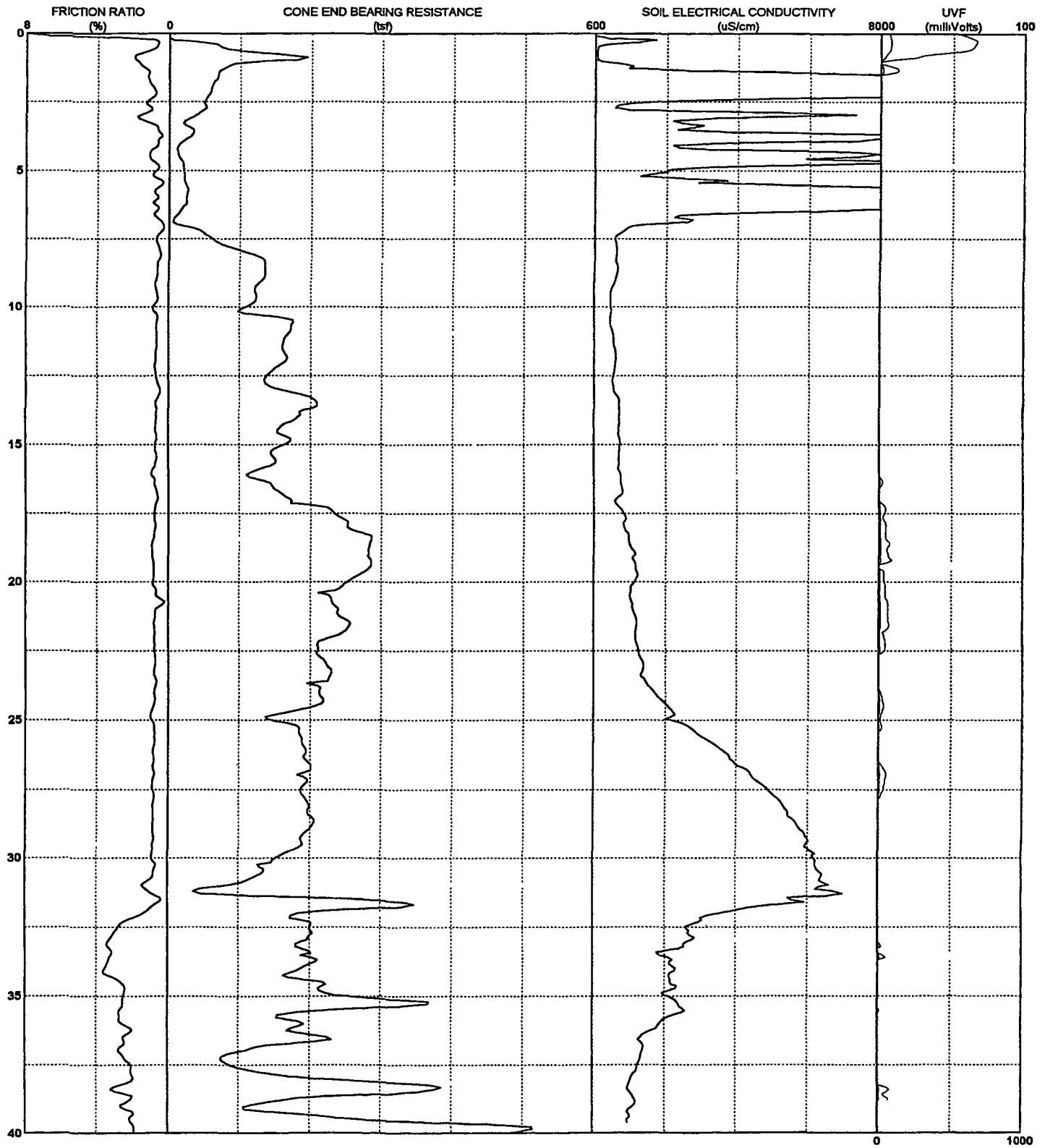


PROJECT NAME:WCP Site
PROJECT NUMBER:00-120-080

STRATIGRAPHICS

DATE: 7-24-2000 TIME:12:17 24 79
SOUNDING NUMBER:CP-004

CPT-EC-UVF LOG



PROJECT NAME:WCP Site
PROJECT NUMBER 00-120-080

STRATIGRAPHICS

DATE. 7-24-2000 TIME 09 23 10 54
SOUNDING NUMBER.CP-001

STRATIGRAPHICS Evaluated Properties Using Global Database

PROJECT NAME:WCP Site
PROJECT NUMBER:00-120-080
DATE: 7-24-2000 TIME:09:23:10.54
SOUNDING NUMBER:CP-001

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1 0	105 8	170.4	2.73	1.8	282	Dense, Silty sand to sandy silt	40-42	60-80				25 - 37	40 - 60
1.5	68 8	104.7	1 06	1.2	8317	Medium dense, Sand to silty sand	40-42	40-60				13 - 20	20 - 30
2.0	58 6	85 6	0 54	0.9	13117	Medium dense, Sand to silty sand	40-42	40-60				10 - 14	15 - 20
2.5	49 8	70 4	0 72	1.3	1758	Medium dense, Silty sand to sandy silt	37-40	40-60				11 - 14	15 - 20
3 0	37 0	50 7	0.81	1.7	6357	Medium dense, Silty sand to sandy silt	36-37	40-60				07 - 11	10 - 15
3.5	32.0	43 3	0.19	0.6	2433	Loose, Sand to silty sand	37-40	20-40				04 - 07	06 - 10
4 0	15 4	20 8	0.16	0.6	3650	Loose, Silty sand to sandy silt	31-36	20-40				01 - 03	02 - 04
4 5	13,8	18.2	0.19	1.1	7004	Loose, Silty sand to sandy silt	27-31	20-40				02 - 03	02 - 04
5 0	20,1	26 4	0.15	0.7	2043	Loose, Silty sand to sandy silt	31-36	20-40				03 - 05	04 - 06
5 5	22,8	29.6	0 09	0 4	4657	Loose, Sand to silty sand	36-37	20-40				03 - 05	04 - 06
6 0	24,1	31.0	0.11	0 6	12506	Loose, Silty sand to sandy silt	36-37	20-40				03 - 05	04 - 06
6 5	14,4	18 3	0.16	0 8	5645	Loose, Silty sand to sandy silt	31-36	20-40				00 - 02	00 - 02
7 0	15.0	18 9	0 14	0.3	1340	Very loose, Sensitive fine grained soil	31-36	0-20				00 - 02	00 - 02
7.5	60 0	75 2	0 58	0 7	577	Medium dense, Sand to silty sand	40-42	40-60				12 - 16	15 - 20
8 0	110,8	137 8	0 68	0.5	615	Medium dense, Sand to silty sand	40-42	40-60				16 - 24	20 - 30
8 5	136 3	168 3	0 87	0.6	651	Medium dense, Sand to silty sand	42-46	40-60				24 - 32	30 - 40
9.0	133 1	163.2	0 99	0.7	592	Medium dense, Sand to silty sand	42-46	40-60				24 - 33	30 - 40
9.5	123 7	150.5	0.81	0.6	459	Medium dense, Sand to silty sand	42-46	40-60				25 - 33	30 - 40
10.0	109 6	132.5	1 17	0 9	462	Medium dense, Sand to silty sand	40-42	40-60				25 - 33	30 - 40
10.5	175.4	210.6	1.14	0.7	455	Dense, Sand to silty sand	42-46	60-80				33 - 50	40 - 60
11 0	168 1	200 5	1 13	0 7	540	Dense, Sand to silty sand	42-46	60-80				34 - 50	40 - 60
11 5	160,9	190 7	1 14	0 7	581	Dense, Sand to silty sand	42-46	60-80				34 - 51	40 - 60
12.0	164.0	193 2	1 22	0 8	598	Dense, Sand to silty sand	42-46	60-80				34 - 51	40 - 60
12.5	139.3	163 1	1 06	0 7	549	Medium dense, Sand to silty sand	42-46	40-60				26 - 34	30 - 40
13 0	156 2	181.8	0.95	0 5	549	Medium dense, Sand to silty sand	42-46	40-60				34 - 52	40 - 60
13 5	208 9	241.8	1 53	0 7	693	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
14 0	182,8	210.3	1.36	0.7	704	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
14 5	154,1	176.4	1.23	0.7	685	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
15 0	163 2	185 8	1 25	0 8	729	Dense, Sand to silty sand	42-46	60-80				35 - 53	40 - 60
15 5	150 4	170.4	0 99	0 7	698	Medium dense, Sand to silty sand	42-46	40-60				35 - 53	40 - 60
16.0	116 1	130.9	1.44	1 0	728	Medium dense, Sand to silty sand	40-42	40-60				27 - 35	30 - 40
16 5	147.2	165.1	1 20	0 8	773	Medium dense, Sand to silty sand	42-46	40-60				36 - 54	40 - 60
17 0	173.2	193 3	1.22	0.6	604	Dense, Sand to silty sand	42-46	60-80				36 - 54	40 - 60
17.5	233.2	259 0	1 93	0 8	839	Dense, Sand to silty sand	42-46	60-80				36 - 54	40 - 60
18 0	252.0	278 6	2 06	0 8	858	Dense, Sand to silty sand	42-46	60-80				36 - 54	40 - 60
18 5	284.6	313.2	2.50	0.9	992	Dense, Sand to silty sand	42-46	60-80				55 - 90	60 - 99
19 0	281.2	308 1	2.57	0.9	1154	Dense, Sand to silty sand	42-46	60-80				55 - 90	60 - 99
19.5	282.0	307.6	2.38	0.8	1170	Dense, Sand to silty sand	42-46	60-80				55 - 91	60 - 99
20 0	252 3	274.0	2.26	0 9	1143	Dense, Sand to silty sand	42-46	60-80				37 - 55	40 - 60
20.5	226.7	245 1	1 74	0.7	1030	Dense, Sand to silty sand	42-46	60-80				37 - 55	40 - 60
21.0	239.4	257.8	1.81	0.7	1094	Dense, Sand to silty sand	42-46	60-80				37 - 56	40 - 60
21.5	256.0	274 5	1.98	0.8	1203	Dense, Sand to silty sand	42-46	60-80				37 - 56	40 - 60
22.0	230.6	246.3	2 00	0 8	1170	Dense, Sand to silty sand	42-46	60-80				37 - 56	40 - 60
22.5	210.9	224.3	1.72	0.8	1258	Dense, Sand to silty sand	42-46	60-80				38 - 56	40 - 60
23.0	222 6	235.9	1.71	0.8	1402	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
23.5	226 3	238 9	1 49	0 7	1402	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
24 0	212.7	223 7	1 77	0 8	1892	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
24 5	205.2	214 9	1 79	0.8	2081	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
25.0	145.5	151.9	1.61	0.9	2139	Medium dense, Sand to silty sand	40-42	40-60				29 - 38	30 - 40

* Indicates lightly overconsolidated soil
** Indicates heavily overconsolidated or cemented soil

Mixed soils containing both granular and fine grained particles (e.g. clayey sands) may undergo partial drained failure during CPT.
Both undrained and drained parameters can be estimated for these soils.

Structure rate of loading should be considered in choosing which strength parameters to use for design.
Drained and undrained parameters must not be combined as such combination will result in significant overprediction of in situ shear strength.

STRATIGRAPHICS Evaluated Properties Using Global Database

PROJECT NAME:WCP Site
PROJECT NUMBER:00-120-080
DATE: 7-24-2000 TIME:09:23:10.54
SOUNDING NUMBER:CP-001

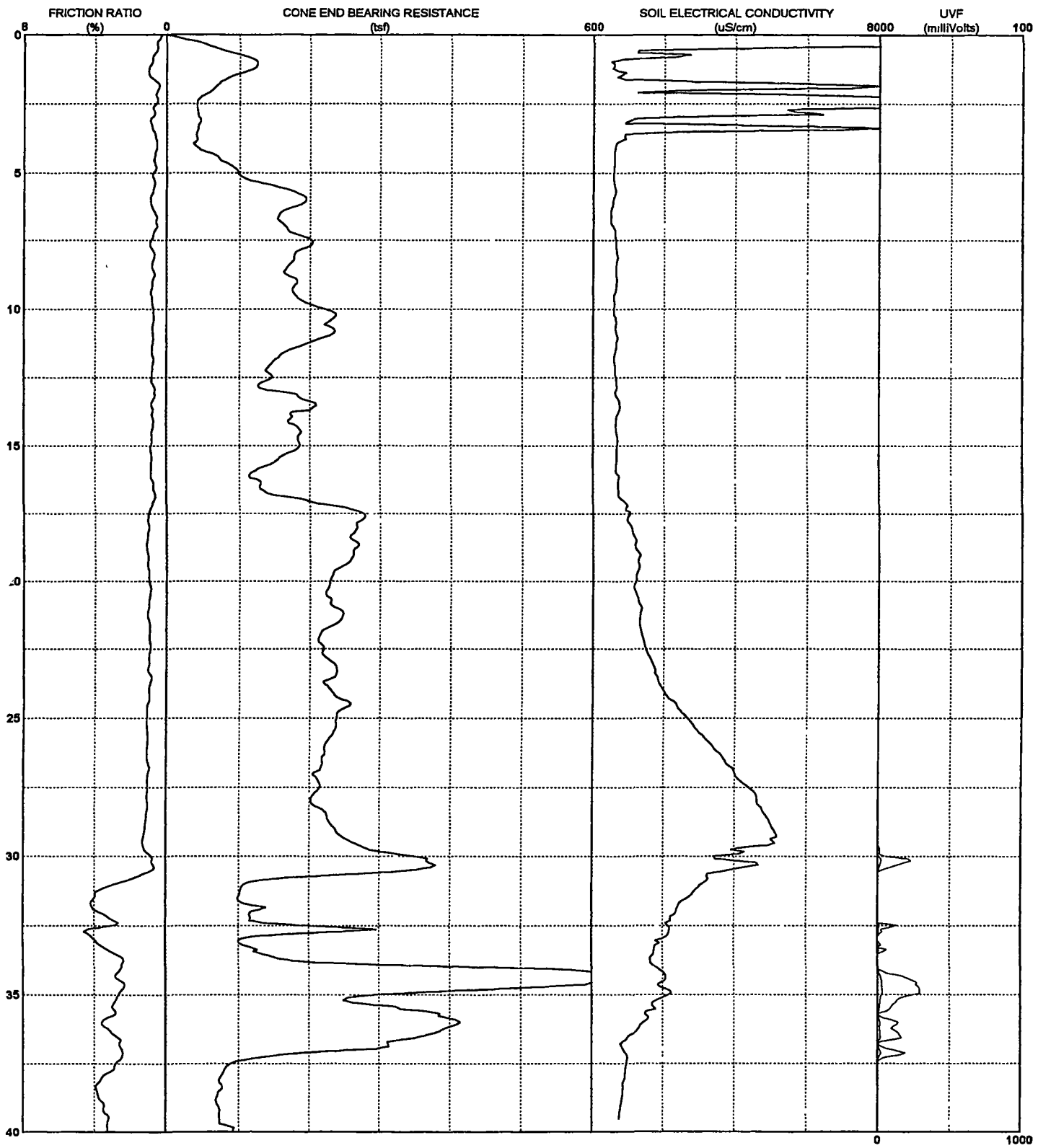
Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Fnction (tsf)	Averaged Fnction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25 5	185 2	192.5	1.46	0.8	2920	Dense, Sand to silty sand	42-46	60-80				38 - 58	40 - 60
26 0	193 2	200 1	1.62	0 8	3518	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
26 5	197.7	204 1	1.61	0.8	3945	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
27 0	186 6	192.0	1.60	0.8	4440	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
27.5	187.8	192 5	1 67	0.9	4891	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
28.0	197 8	202 0	1.76	0.9	5293	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
28.5	202.7	206 4	1.73	0.9	5491	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
29 0	198 2	199 1	1.80	0.9	5842	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
29 5	190.1	192.3	1.73	0.9	5961	Dense, Sand to silty sand	42-46	60-80				40 - 59	40 - 60
30 0	152 6	153 8	1 72	0 9	6192	Medium dense, Sand to silty sand	40-42	40-60				30 - 40	30 - 40
30 5	135 2	135 8	1.15	0 8	6364	Medium dense, Sand to silty sand	40-42	40-60				30 - 40	30 - 40
31 0	79 3	79 4	1 79	1 4	6473	Medium dense, Silty sand to sandy silt	37-40	40-60				20 - 30	20 - 30
31 5	267.4	267 0	0 91	0.4	5541	Dense, Sandy gravel to gravelly sand	+46	60-80				40 - 60	40 - 60
32.0	183 5	182 7	3.82	1 4	3566	Dense, Sand to silty sand	40-42	60-80				40 - 60	40 - 60
32 5	199 9	198 4	5 50	2 8	2614	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 101	+ 100
33 0	191 5	189.5	6 60	3 3	2702	Hard, Gravelly clayey sand to gravelly sandy silt			33	11.49	13.19	+ 101	+ 100
33 5	191.7	189.1	6 33	3 2	1852	Very dense, Gravelly silty sand to clayey gravelly s	38-37	+100				+ 101	+ 100
34.0	187.3	184.2	6.90	3 5	2316	Hard, Gravelly clayey sand to gravelly sandy silt			33	11.23	13 80	+ 102	+ 100
34 5	219 1	214 8	5 81	2.6	2171	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 102	+ 100
35 0	251 7	246 1	7 61	2.5	2077	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 102	+ 100
35.5	234.6	228.8	8.32	2.7	2563	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 103	+ 100
36 0	192 5	187.2	4.88	2.5	1865	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 103	+ 100
36.5	226.1	219 2	4.83	2 5	1333	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 103	+ 100
37 0	103 4	99.9	4 55	2 7	1386	Very dense, Silty sand to sandy silt	38-37	80-100				41 - 62	40 - 60
37.5	86.8	83.7	2 71	2 1	1265	Dense, Silty sand to sandy silt	37-40	60-80				21 - 31	20 - 30
38 0	206 3	198.3	6.09	1.9	1067	Very dense, Silty sand to sandy silt	40-42	80-100				62 - 103	60 - 99
38.5	343 5	329.3	9 40	2 8	1061	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 104	+ 100
39 0	111 7	106 8	5 52	2.6	1132	Very dense, Silty sand to sandy silt	38-37	80-100				42 - 63	40 - 60
39 5	272.7	260 1	9 52	2.1	978	Very dense, Gravelly silty sand to clayey gravelly s	40-42	80-100				+ 105	+ 100
40 0	476 8	453.4	11 02	1 9	N/A	Very dense, Sandy gravel to silty gravelly sand	42-46	+100				+ 105	+ 100

* Indicates lightly overconsolidated soil
** Indicates heavily overconsolidated or cemented soil

Mixed soils containing both granular and fine grained particles (e.g. clayey sands) may undergo partial drained failure during CPT.
Both undrained and drained parameters can be estimated for these soils.

Structure rate of loading should be considered in choosing which strength parameters to use for design.
Drained and undrained parameters must not be combined as such combination will result in significant overprediction of in situ shear strength.

CPT-EC-UVF LOG



PROJECT NAME.WCP Site
PROJECT NUMBER.00-120-080

STRATIGRAPHICS

DATE. 7-24-2000 TIME:10.36 16 29
SOUNDING NUMBER.CP-002

STRATIGRAPHICS Evaluated Properties Using Global Database

PROJECT NAME:WCP Site
PROJECT NUMBER:00-120-080
DATE: 7-24-2000 TIME:10:36:16.29
SOUNDING NUMBER:CP-002

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0	127.2	205 0	0.87	0 9	679	Dense, Sand to silty sand	42-46	60-80				25 - 37	40 - 60
1.5	89.3	136.0	1 06	0 9	713	Medium dense, Sand to silty sand	40-42	40-60				20 - 28	30 - 40
2 0	62.0	90.5	0.36	0.5	2729	Medium dense, Sand to silty sand	40-42	40-60				10 - 14	15 - 20
2 5	41 2	58 2	0.28	0 6	13112	Loose, Sand to silty sand	37-40	20-40				04 - 07	06 - 10
3 0	44.8	61 5	0.37	0.8	2068	Medium dense, Sand to silty sand	37-40	40-60				07 - 11	10 - 15
3 5	41 3	55.9	0 31	0.7	3432	Loose, Sand to silty sand	37-40	20-40				04 - 07	06 - 10
4 0	38 6	51.7	0.32	0 8	821	Loose, Sand to silty sand	37-40	20-40				04 - 07	06 - 10
4 5	73 6	97 6	0 63	0.7	593	Medium dense, Sand to silty sand	40-42	40-60				15 - 23	20 - 30
5 0	98 1	128 6	0 93	0.8	585	Medium dense, Sand to silty sand	40-42	40-60				15 - 23	20 - 30
5 5	152.1	197.6	1 33	0 7	601	Dense, Sand to silty sand	42-46	60-80				31 - 48	40 - 60
6.0	194.6	250.4	1.59	0.9	558	Dense, Sand to silty sand	42-46	60-80				31 - 47	40 - 60
6 5	158 9	200 1	1.18	0 7	485	Dense, Sand to silty sand	42-46	60-80				31 - 47	40 - 60
7 0	164 6	208 1	0 91	0.5	552	Dense, Sand to silty sand	42-46	60-80				32 - 47	40 - 60
7.5	202 4	253 8	1.63	0.9	638	Dense, Sand to silty sand	42-46	60-80				32 - 48	40 - 60
8 0	177 7	221 1	1.27	0 7	672	Dense, Sand to silty sand	42-46	60-80				32 - 48	40 - 60
8.5	166.3	205.4	1.45	0.8	643	Dense, Sand to silty sand	42-46	60-80				32 - 49	40 - 60
9 0	182 1	223.1	1 43	0 8	663	Dense, Sand to silty sand	42-46	60-80				33 - 49	40 - 60
9.5	179 3	218.1	1.65	0.9	582	Dense, Sand to silty sand	42-46	60-80				33 - 49	40 - 60
10 0	221.5	267 7	1 74	0 8	586	Dense, Sand to silty sand	42-46	60-80				33 - 50	40 - 60
10 5	225.0	270 1	1.77	0.8	649	Dense, Sand to silty sand	42-46	60-80				33 - 50	40 - 60
11 0	224 0	267 2	1 71	0.8	684	Dense, Sand to silty sand	42-46	60-80				34 - 50	40 - 60
11 5	169 5	200 9	1 56	0.8	631	Dense, Sand to silty sand	42-46	60-80				34 - 51	40 - 60
12 0	143 8	169 4	1 23	0.8	608	Medium dense, Sand to silty sand	42-46	40-60				34 - 51	40 - 60
12.5	145.4	170 2	1 18	0 8	643	Dense, Sand to silty sand	42-46	60-80				34 - 51	40 - 60
13 0	151 1	175 9	1.35	0.7	633	Medium dense, Sand to silty sand	42-46	40-60				34 - 52	40 - 60
13.5	209 2	242.1	1.70	0.9	751	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
14 0	172.4	198.4	1 30	0.8	654	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
14.5	187.5	214 7	1.57	0 8	659	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
15 0	185 3	211 0	1 62	0.9	679	Dense, Sand to silty sand	42-46	60-80				35 - 53	40 - 60
15 5	154 6	175.1	1.38	0 8	663	Dense, Sand to silty sand	42-46	60-80				35 - 53	40 - 60
16 0	116 8	131 7	1 20	0 9	672	Medium dense, Sand to silty sand	40-42	40-60				27 - 35	30 - 40
16 5	128 7	144 3	1.18	0 8	706	Medium dense, Sand to silty sand	40-42	40-60				27 - 36	30 - 40
17 0	195 4	218 0	1.64	0 7	848	Dense, Sand to silty sand	42-46	60-80				36 - 54	40 - 60
17 5	276 1	306 6	2.73	1 0	1035	Dense, Sand to silty sand	42-46	60-80				54 - 89	60 - 99
18 0	268.1	298 5	2.53	1.0	1100	Dense, Sand to silty sand	42-46	60-80				54 - 90	60 - 99
18 5	262.8	289 2	2.90	1.1	1222	Dense, Sand to silty sand	42-46	60-80				55 - 90	60 - 99
19.0	262.3	287.4	2.75	1.0	1333	Dense, Sand to silty sand	42-46	60-80				55 - 90	60 - 99
19.5	242.8	264.8	2.63	1.0	1312	Dense, Sand to silty sand	42-46	60-80				55 - 91	60 - 99
20 0	229 3	249.0	2.30	1.0	1227	Dense, Sand to silty sand	42-46	60-80				37 - 55	40 - 60
20 5	223 7	241.8	2.08	0 9	1250	Dense, Sand to silty sand	42-46	60-80				37 - 55	40 - 60
21.0	238 5	256.8	2.45	1 0	1381	Dense, Sand to silty sand	42-46	60-80				56 - 92	60 - 99
21 5	242 2	259 7	2.33	1.0	1336	Dense, Sand to silty sand	42-46	60-80				37 - 56	40 - 60
22.0	215 2	229 8	2.17	0 9	1397	Dense, Sand to silty sand	42-46	60-80				37 - 58	40 - 60
22.5	220 5	234.6	2.05	0 9	1512	Dense, Sand to silty sand	42-46	60-80				38 - 56	40 - 60
23 0	233 6	247.6	2.28	1 0	1681	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
23.5	236 6	249.7	1.96	0 8	1817	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
24 0	230 8	242 6	2 42	1.0	2000	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
24 5	258 4	270 7	2 83	1 1	2360	Dense, Sand to silty sand	42-46	60-80				57 - 95	60 - 99
25 0	238 4	248 8	2.68	1.1	2694	Dense, Sand to silty sand	42-46	60-80				57 - 95	60 - 99

* Indicates lightly overconsolidated soil
** Indicates heavily overconsolidated or cemented soil

Mixed soils containing both granular and fine grained particles (e.g. clayey sands) may undergo partial drained failure during CPT.
Both undrained and drained parameters can be estimated for these soils.

Structure rate of loading should be considered in choosing which strength parameters to use for design.
Drained and undrained parameters must not be combined as such combination will result in significant overprediction of in situ shear strength.

STRATIGRAPHICS Evaluated Properties Using Global Database

PROJECT NAME:WCP Site
PROJECT NUMBER:00-120-080
DATE: 7-24-2000 TIME:10:36:16.29
SOUNDING NUMBER:CP-002

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25 5	234.3	243 7	2.52	1.1	3005	Dense, Sand to silty sand	42-46	60-80				38 - 58	40 - 60
26 0	222.0	230 0	2.42	1.1	3390	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
26.5	218 2	225.3	2.38	1 1	3717	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
27.0	205.2	211.1	2.23	1.0	4008	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
27.5	214 9	220.3	2.26	1.1	4417	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
28.0	202 0	206.4	2.29	1.1	4640	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
28.5	225 6	229 7	2.59	1 1	4887	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
29 0	236.9	240 4	2.96	1.2	5085	Dense, Sand to silty sand	42-46	60-80				59 - 98	60 - 99
29.5	262.5	265 5	3 91	1 3	5126	Very dense, Sand to silty sand	42-46	80-100				59 - 98	60 - 99
30 0	349.4	352.3	2.52	0 8	3469	Dense, Sand to silty sand	42-46	60-80				60 - 98	60 - 99
30 5	344.2	345.9	2 61	0.8	3856	Dense, Sand to silty sand	42-46	60-80				60 - 99	60 - 99
31.0	109 0	109.2	5 75	2.8	3099	Very dense, Silty sand to sandy silt	36-37	80-100				40 - 60	40 - 60
31.5	99 2	99.0	4 48	4.0	2701	Hard, Gravelly sandy clay to gravelly silty clay **			30	6 49	8.96	60 - 99	60 - 99
32.0	117 8	117 0	4.95	3 8	2379	Hard, Gravelly clayey sand to gravelly sandy silt			30	7.71	9 90	+ 100	+ 100
32.5	199.2	197.7	5 38	3 0	2154	Very dense, Gravelly silty sand to clayey gravelly s	36-37	+100				+ 101	+ 100
33 0	102 5	101.4	7 67	4 0	1890	Hard, Gravelly sandy clay to gravelly silty clay **			30	6.70	15.34	61 - 100	60 - 99
33 5	129 8	128 0	6 14	2 9	1745	Very dense, Gravelly silty sand to clayey gravelly s	36-37	+100				61 - 100	60 - 99
34.0	428.5	421.4	15 15	2.5	1815	Very dense, Gravelly silty sand to clayey gravelly s	40-42	+100				+ 102	+ 100
34 5	663.9	651.0	15.16	2.5	2028	Very dense, Gravelly silty sand to clayey gravelly s	40-42	+100				+ 102	+ 100
35 0	298.4	291.7	12.92	2.7	2175	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 102	+ 100
35.5	329.2	320.9	11.53	3 0	1783	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 103	+ 100
36 0	415.0	403 4	14 25	3 6	1467	Very dense, Gravelly silty sand to clayey gravelly s	27-31	+100				+ 103	+ 100
36 5	361.4	350 3	11.10	2.8	1038	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 103	+ 100
37 0	269 6	260.6	7 69	2.5	880	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 103	+ 100
37 5	89 6	86 4	4.31	2 8	972	Hard, Sandy silt to sandy clay			30	5 82	8 61	41 - 62	40 - 60
38 0	74.3	71 5	2.88	3 6	932	Hard, Sandy silt to sandy clay			30	4 80	5.76	42 - 62	40 - 60
38 5	72.6	69.6	2.85	3 8	871	Hard, Gravelly sandy clay to gravelly silty clay **			30	4.68	5 70	42 - 63	40 - 60
39 0	71 1	68.0	2 47	3.4	819	Hard, Sandy silt to sandy clay			25	5.50	4.94	31 - 42	30 - 40
39 5	73 8	70 3	2.60	3.2	771	Hard, Sandy silt to sandy clay			25	5.71	5.20	31 - 42	30 - 40

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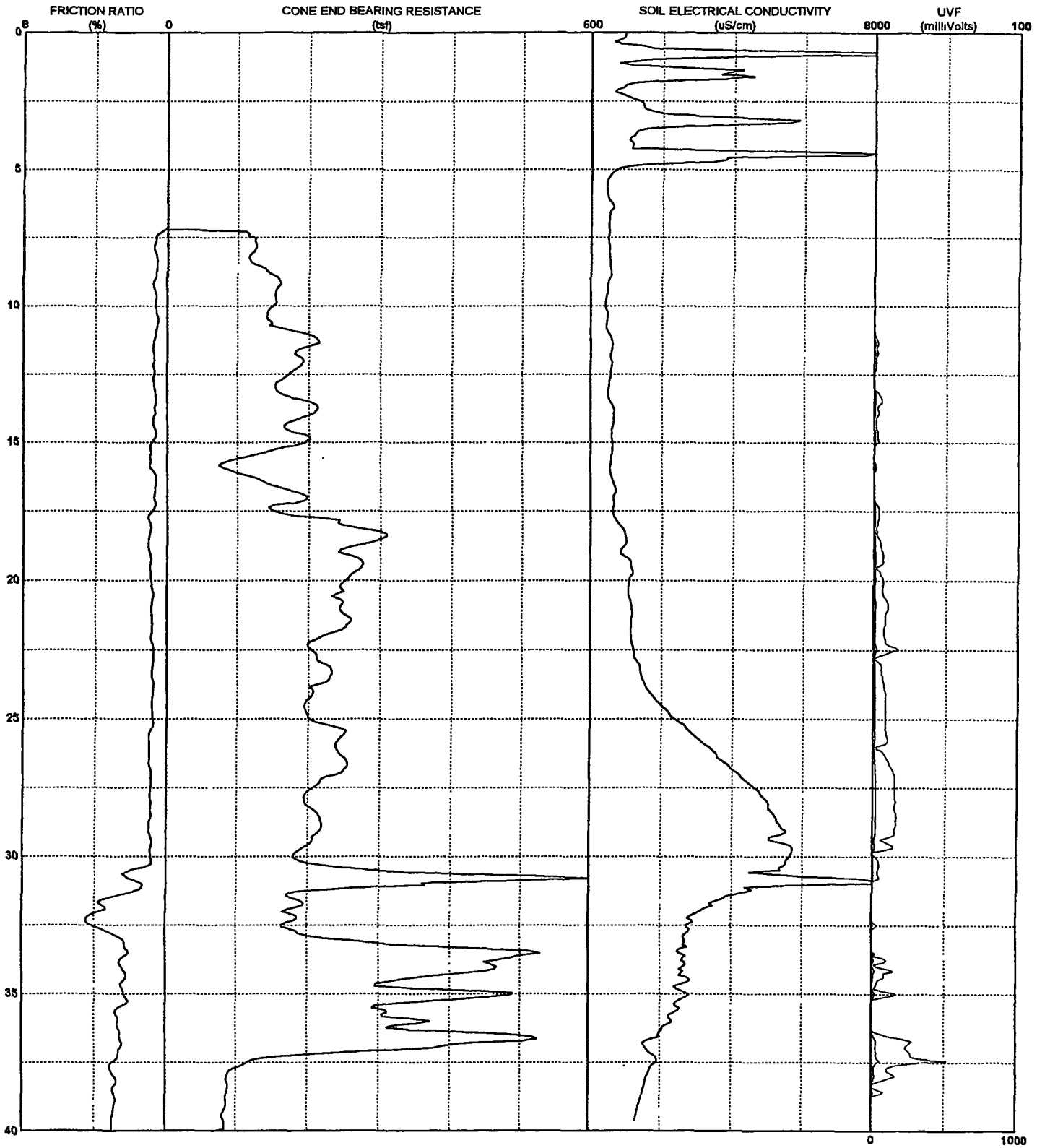
CPT-EC-UVF LOG



PROJECT NAME.WCP Site
PROJECT NUMBER 00-120-080

STRATIGRAPHICS

DATE: 7-24-2000 TIME.12 17:24.79
SOUNDING NUMBER CP-004

STRATIGRAPHICS Evaluated Properties Using Global Database

PROJECT NAME:WCP Site
PROJECT NUMBER:00-120-080
DATE: 7-24-2000 TIME:12:17:24.79
SOUNDING NUMBER:CP-004

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
1.0													
1 5													
2.0													
2.5													
3 0													
3.5													
4.0													
4.5													
5.0													
5.5													
6.0													
6 5													
7.0													
7.5	122.0	152.9	0.84	0.7	473	Medium dense, Sand to silty sand	42-46	40-60				24 - 32	30 - 40
8.0	122.6	152.5	0.90	0.7	494	Medium dense, Sand to silty sand	42-46	40-60				24 - 32	30 - 40
8.5	126.6	156.3	0.89	0.6	517	Medium dense, Sand to silty sand	42-46	40-60				24 - 32	30 - 40
9 0	157.6	193 2	1.05	0.7	524	Dense, Sand to silty sand	42-46	60-80				33 - 49	40 - 60
9.5	154 1	187 6	1.07	0.7	467	Dense, Sand to silty sand	42-46	60-80				33 - 49	40 - 60
10.0	150.5	181 9	1.00	0.7	394	Medium dense, Sand to silty sand	42-46	40-60				33 - 50	40 - 60
10 5	144 2	173.0	0.80	0.5	447	*Medium dense, Sand to silty sand*	42-46	40-60				25 - 33	30 - 40
11.0	192.5	229 6	1.38	0.7	499	Dense, Sand to silty sand	42-46	60-80				34 - 50	40 - 60
11.5	198 7	235 4	1.65	0 8	602	Dense, Sand to silty sand	42-46	60-80				34 - 51	40 - 60
12.0	192.7	227.0	1.37	0.7	577	Dense, Sand to silty sand	42-46	60-80				34 - 51	40 - 60
12.5	172 5	202 0	1.28	0.7	566	Dense, Sand to silty sand	42-46	60-80				34 - 51	40 - 60
13 0	153.5	178.7	1.25	0.7	486	Dense, Sand to silty sand	42-46	60-80				34 - 52	40 - 60
13.5	200.8	232.4	1.32	0.6	555	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
14.0	200 2	230.4	1 47	0.7	640	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
14.5	167.8	192.1	1.31	0.7	587	Dense, Sand to silty sand	42-46	60-80				35 - 52	40 - 60
15.0	194 0	220.9	1.64	0 9	603	Dense, Sand to silty sand	42-46	60-80				35 - 53	40 - 60
15 5	118.3	134 1	1.52	0 9	578	Medium dense, Sand to silty sand	40-42	40-60				26 - 35	30 - 40
16 0	87.6	98.7	0 95	0.8	539	Medium dense, Sand to silty sand	40-42	40-60				18 - 27	20 - 30
16.5	143 2	160.6	1.12	0.7	643	Medium dense, Sand to silty sand	42-46	40-60				27 - 38	30 - 40
17.0	198.1	221.1	1 39	0 8	623	Dense, Sand to silty sand	42-46	60-80				36 - 54	40 - 60
17.5	150.6	167.3	1.68	0 8	608	Dense, Sand to silty sand	42-46	60-80				36 - 54	40 - 60
18 0	245 7	271.7	2.62	0.9	795	Dense, Sand to silty sand	42-46	60-80				54 - 90	60 - 99
18.5	300 5	330.7	3.00	1.0	974	Very dense, Sand to silty sand	42-46	80-100				55 - 90	60 - 99
19.0	245.8	269 3	2.63	1.0	841	Dense, Sand to silty sand	42-46	60-80				55 - 90	60 - 99
19.5	274 0	298.8	2.66	1.0	1127	Dense, Sand to silty sand	42-46	60-80				55 - 91	60 - 99
20 0	251.3	273 0	2.36	0.9	1072	Dense, Sand to silty sand	42-46	60-80				55 - 91	60 - 99
20.5	238.5	257.9	1.84	0.8	1061	Dense, Sand to silty sand	42-46	60-80				37 - 55	40 - 60
21.0	243 9	262 6	2.24	0.9	1160	Dense, Sand to silty sand	42-46	60-80				37 - 56	40 - 60
21 5	257 8	276 5	2.11	0.8	1149	Dense, Sand to silty sand	42-46	60-80				37 - 56	40 - 60
22 0	220 3	235 3	2.20	0.9	1146	Dense, Sand to silty sand	42-46	60-80				37 - 56	40 - 60
22 5	204 5	217.6	1.64	0.8	1216	Dense, Sand to silty sand	42-46	60-80				38 - 56	40 - 60
23.0	221 3	234 5	1.84	0.8	1353	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
23 5	229 9	242.7	2.01	0 9	1434	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
24 0	206 4	217 0	1 74	0.8	1641	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
24 5	194 4	203 7	1.72	0.9	2001	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60
25 0	201 6	210 4	1.88	0 8	2368	Dense, Sand to silty sand	42-46	60-80				38 - 57	40 - 60

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STRATIGRAPHICS Evaluated Properties Using Global Database

PROJECT NAME:WCP Site
PROJECT NUMBER:00-120-080
DATE: 7-24-2000 TIME:12:17:24.79
SOUNDING NUMBER:CP-004

Depth (ft)	Cone (tsf)	Norm Cone (tsf)	Friction (tsf)	Averaged Friction Ratio (%)	Soil Conductivity (uS/cm)	Evaluated Soil Type	Drained Friction Angle (deg)	Relative Density (%)	Nc	Undrained Shear Strength (ksf)	Undrained Large Strain Shear Strength (ksf)	SPT (N)	NORM SPT (N1')
25.5	251.5	261.5	2.32	0 9	2818	Dense, Sand to silty sand	42-46	60-80				38 - 58	40 - 60
26 0	238.5	247.1	2.39	1.0	3327	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
26.5	253 0	261.2	2 46	1.0	3720	Dense, Sand to silty sand	42-46	60-80				58 - 98	60 - 99
27 0	242 9	249 9	2.14	0.9	4189	Dense, Sand to silty sand	42-46	60-80				39 - 58	40 - 60
27 5	207.7	212.9	1.98	0.9	4643	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
28.0	195.4	199.6	1.81	0 9	5007	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
28.5	215 1	219 0	1 92	0.9	5225	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
29 0	217 5	220 7	2 14	1 0	5475	Dense, Sand to silty sand	42-46	60-80				39 - 59	40 - 60
29 5	204.3	206.7	1.72	0 8	5414	Dense, Sand to silty sand	42-46	60-80				40 - 59	40 - 60
30 0	179 8	181 3	1 85	0 9	5628	Dense, Sand to silty sand	42-46	60-80				40 - 60	40 - 60
30 5	297 6	299 0	9.32	2.0	5155	Very dense, Gravelly silty sand to clayey gravelly s	40-42	+100				+ 100	+ 100
31 0	362.5	363 1	5.97	1 4	7838	Very dense, Sand to silty sand	42-46	80-100				+ 100	+ 100
31 5	178 7	178 4	7.23	3 1	3783	Very dense, Gravelly silty sand to clayey gravelly s	36-37	+100				+ 100	+ 100
32 0	166 0	165 2	6 71	3 7	3058	Hard, Gravelly clayey sand to gravelly sandy silt			33	9.94	13.42	+ 100	+ 100
32 5	165.0	163 8	7.90	4 2	2733	Hard, Gravelly clayey sand to gravelly sandy silt			33	9 88	15 80	+ 101	+ 100
33 0	236 9	234 4	8 93	2.4	2669	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 101	+ 100
33 5	524.8	517.7	9 93	2.1	2541	Very dense, Sandy gravel to silty gravelly sand	40-42	+100				+ 101	+ 100
34 0	466 5	458.8	11.73	2.5	2641	Very dense, Gravelly silty sand to clayey gravelly s	40-42	+100				+ 102	+ 100
34.5	323 9	317.6	9.32	2 3	2823	Very dense, Gravelly silty sand to clayey gravelly s	40-42	+100				+ 102	+ 100
35.0	488 0	477.1	9 19	2 3	2764	Very dense, Gravelly silty sand to clayey gravelly s	40-42	+100				+ 102	+ 100
35 5	292 5	285 2	9 73	2 6	2514	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 103	+ 100
36 0	372 6	362 2	9.74	2 6	2348	Very dense, Gravelly silty sand to clayey gravelly s	37-40	+100				+ 103	+ 100
36 5	494 7	479.6	11.60	2.6	1964	Very dense, Gravelly silty sand to clayey gravelly s	40-42	+100				+ 103	+ 100
37.0	354.7	342.9	11.63	2 6	1609	Very dense, Gravelly silty sand to clayey gravelly s	40-42	+100				+ 103	+ 100
37.5	115 5	111.3	5 98	3.0	1886	Hard, Gravelly clayey sand to gravelly sandy silt			30	7.55	11.98	41 - 82	40 - 60
38 0	86 7	83.3	2.85	2 9	1630	Hard, Sandy silt to sandy clay			30	5 63	5.70	42 - 82	40 - 60
38.5	87.3	83.7	2.62	3.0	1521	Hard, Sandy silt to sandy clay			30	5.67	5 24	42 - 63	40 - 60
39 0	85 9	82 2	2.44	2.8	1415	Hard, Sandy silt to sandy clay			30	5 57	4.88	31 - 42	30 - 40
39 5	80 8	77.1	2 49	3 0	1322	Hard, Sandy silt to sandy clay			30	5.23	4 97	31 - 42	30 - 40
40 0	67 2	63 9	3 05	3 0	N/A	Hard, Sandy silt to sandy clay			25	5.18	6.10	21 - 32	20 - 30

* Indicates lightly overconsolidated soil
** Indicates heavily overconsolidated or cemented soil

Mixed soils containing both granular and fine grained particles (e.g. clayey sands) may undergo partial drained failure during CPT.
Both undrained and drained parameters can be estimated for these soils.

Structure rate of loading should be considered in choosing which strength parameters to use for design.
Drained and undrained parameters must not be combined as such combination will result in significant overprediction of in situ shear strength.

APPENDIX A
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A1.0 EVALUATION OF GEOTECHNICAL PARAMETERS

CPT data have been correlated with soil type, drained friction angle, undrained shear strength, relative density, and equivalent SPT blowcounts, among others. Correlations have been developed by comparing CPT results to laboratory tests on drilled samples and to other in situ tests, such as vane and pressuremeter. Laboratory CPT testing on large scale samples of known composition and classical bearing capacity and cavity expansion theo have also been used. Site specific information, where available, can be used to fine tune correlations.

A two parameter correlation scheme has proved useful for CPT data interpretation. Geotechnical properties often exhibit well defined trends when plotted against the logarithm of the CPT cone end bearing resistance and friction ratio. For instance, increased grain size increases cone end bearing resistance, while increased plasticity and compressibility increases friction ratio. A generalized chart illustrating these and other trends is presented in Figure A2. An extensive discussion of CPT data evaluation is presented in Douglas and Olsen, 1981.

A1.1 CPT Soil Behavior Types CPT soil behavior type correlations have been developed from geotechnical theory and comparisons of borehole data with CPT data (Douglas and Olsen, 1981). The CPT soil behavior type tabulations are indicative of the response of the soil to the large shear deformations imposed on the soil during penetrometer advance. Soil shear response is not entirely controlled by grain size distribution. However, it has been found that soil types correlated with CPT generally agree with classifications based on soil grain size distribution methods such as the Unified Soil Classification System (USCS). A generalized soil classification chart is presented in Figure A3.

A1.2 CPT Relative Density Relative densities of granular soils are correlated with CPT data on the basis of laboratory CPT on large scale samples of known composition (Schmertmann, 1978, and Villet and Mitchell, 1981). The effect of soil fines content has been empirically accounted for by extrapolating trends in the two parameter correlation model (Douglas and Strutynsky, 1984). A generalized relative density chart is presented in Figure A4.

A1.3 CPT Drained Static Strength Drained friction angles have been correlated with CPT results on the basis of CPT soundings and laboratory tests on drilled samples, and on theoretical analyses of the cone end bearing capacity problem (Schmertmann, 1978, Durgunoglu and Mitchell, 1974, and Villet and Mitchell, 1981). The effect of soil fines content on friction angles has been accounted for by extrapolating trends in the two parameter correlation model, as was done for the relative density correlation. A generalized drained friction angle chart is also presented in Figure A4.

A1.4 CPT Undrained Static Strength The correlation between CPT data and undrained shear strength has been extensively studied (Douglas and others, 1984, Lunne and others, 1976, Sanglerat, 1972, and Schmertmann, 1978). The following bearing capacity equation is used for computing undrained shear strength from CPT data: $qu = (Su * Nc) + Sv$ (Eq. A1); where: qu = ultimate bearing capacity; Su = undrained shear strength; Nc = a dimensionless bearing capacity factor; and Sv = the estimated total vertical stress. By setting qu equal to the cone end bearing resistance, qc, and rearranging the equation, a value of the undrained shear strength can be as: $Su = (qc - Sv)/Nc$ (Eq. A2).

The primary difficulty in using this equation has been the selection of Nc applicable to cone penetration in a particular soil. Bearing capacity and cavity expansion theory and other in situ and laboratory test results performed adjacent to CPT soundings have been used to calculate Nc values. These Nc values have ranged from 5 to over 25, but are most often between about 12 and 20. Higher Nc values are typically associated with overconsolidated clays and lower plasticity clays and clayey silts.

A compilation of Nc values as a function of cone end bearing resistance and friction ratio is presented in Figure A5. This figure was developed from comparisons of CPT to results of laboratory consolidated-undrained (CU) strength tests. This is important to note as undrained shear strength is not a unique property of a soil - it is test type and stress path dependent.

Many design methodologies are based on a particular strength test on a particular type of sample. These semi-empirical design methods are successfully used by experienced designers. Engineering judgment must be applied in using the results of any type of testing - whether in situ or laboratory - to assure both adequate safety and design economy.

High Strain, Remolded Strength Another measure of the in situ undrained shear strength is provided by the CPT friction sleeve resistance. The friction sleeve interacts with soil that has already undergone bearing capacity failure induced by the tip of the penetrometer. Thus, the friction sleeve resistance is a measure of soil large strain, remolded strength. The ratio between strengths calculated from the cone end bearing and from the friction sleeve is indicative of soil sensitivity.

In moderately to highly overconsolidated, non-sensitive clays, friction sleeve resistances can indicate higher strengths than those calculated using the cone end bearing resistance. This often reflects the dilative (strain rdening) nature of shear failure in overconsolidated soils. Engineering judgment must be applied in deciding ..nich strain level, and thus which strength, is representative for the particular design problem to be solved.

A1.5 Equivalent SPT Blowcount N-Values An equivalent SPT blowcount can be correlated with CPT data by using a mathematical model of the SPT procedure and soil resistances measured during CPT (Douglas and Olsen, 1981). This procedure has been checked by comparison to actual SPT results at various sites throughout the world (Douglas and others, 1981, Douglas and Strutynsky, 1984, and Olsen and Farr, 1986) with generally good results.

The particular SPT equipment used to develop the CPT-SPT correlation chart (Figure A6) consisted of a SPT trip hammer system. This SPT hammer is characterized by reasonably repeatable, measured hammer input energy efficiencies of about 60 to 70% (Douglas and Strutynsky, 1984). This hammer input energy level is similar to that recommended (Seed and others, 1984) as the "standard" Standard Penetration Test input energy. SPT results are both equipment and operator dependent. SPT hammer efficiencies have been measured to range from 35 to over 90% of the theoretical 4200 in-lbs (30 inch height of fall, 140 lbs hammer) SPT input energy. Variable SPT input energy results in variable blowcounts (Douglas and Strutynsky, 1984, Seed and others, 1984). This problem of non-uniform input energy during SPT provides a limitation for quantitative design purposes.

The approach of using the extensive SPT data base, in addition to the CPT data base, by performing CPT and then deriving equivalent SPT blowcount N-values, typically results in higher quality site information. This is because CPT is continuous, has higher resolution, is less expensive, and is much more consistent and repeatable than SPT. The chart that was used for correlating CPT to SPT for this study is presented in Figure A6. After determining the overburden normalized equivalent SPT N'-value, the equivalent SPT blowcount N-value was calculated by dividing the overburden normalized value by the overburden normalization factor CN, as defined in Eq. A3.

The equivalent SPT N-values reflect the higher resolution of the CPT measurements as compared to actual SPT. Performance of actual SPT includes averaging of soil resistance over about a 24 inch interval (18 :h sampler embedment and 2 to 3 sampler diameters ahead of the sampler). Equivalent SPT values ,rrelated with CPT data have a resolution of about six inches. Rather than coarsen the 6 inch resolution equivalent SPT N-value to fit a 24 inch resolution actual SPT N-value, interpreted values are based on point by point CPT data. These high resolution, equivalent SPT values should be more useful for design purposes, especially in interlayered deposits, where thin, weak soil seams cannot be adequately characterized by actual SPT blowcount methods. The high resolution equivalent SPT values and actual SPT measurements should be similar in thick homogeneous strata.

Discrepancies between CPT equivalent SPT N-values and actual, measured SPT N-values are often due to inconsistencies in the performance of actual SPT. Poor fit of CPT equivalent and actual SPT in weak soils with very low blowcounts (0 to 3) can be due to limited accuracy of high capacity CPT loadcells used at the extreme low end of their range, but are more likely caused by extensive borehole disturbance in easily disturbed soil, and set of the SPT sampler under the self-weight of the hammer and drillrods. Discrepancies between equivalent and actual SPT values in very dense or hard soils with high blowcounts, especially in gravelly soils, can be due to both erratic penetrometer or SPT sampler interaction with large soil particles, and basic differences in modes of penetration of the two techniques. Indications of very weak soils, using any method, should strongly encourage additional testing, including undisturbed sampling and sophisticated laboratory testing.

A2.0 OVERBURDEN PRESSURE NORMALIZATION

Overburden normalization of CPT data for correlation purposes is necessary in order to remove the effects of increasing confining pressure with depth on measured results. Cone end bearing resistances can be normalized to an effective vertical overburden pressure of 1 TSF by using the following equations: qc1 = qc * CN (Eq. A3); and CN = 1.0 - 0.5 * log (Sv') (Eq. A4); where: qc1 is the overburden normalized cone end bearing resistance, in TSF; qc is the measured cone resistance, in TSF; CN is the overburden normalization factor; and Sv' is the effective vertical overburden stress in TSF.

'erburden normalization curves are variable (Douglas and Martin, 1980). Most were developed using ,oratory CPT and SPT on large scale samples of clean sands, compacted at various relative densities and subjected to various overburden pressures. Application of laboratory results to natural soils may be limited. The CN presented in Equation A4 is similar to that proposed (Seed and others, 1977) for the effect of overburden on SPT blowcounts.

The friction ratio is not normalized based on the assumption that overburden pressure affects friction sleeve and cone end bearing resistance similarly. Since the quantities are divided by each other to compute friction ratio, overburden effects should cancel. Some experience (Olsen and Farr, 1986) indicates that this assumption may oversimplify actual conditions for deep soundings. The friction resistance may be less sensitive to overburden pressure than the cone end bearing resistance. Thus, in soundings deeper than about 100 ft, the friction ratio may gradually decrease with increased penetration, independent of any changes in soil conditions, other than overburden pressure. Due to the variability in overburden normalization curves, no specific correction for overburden pressure on friction ratio has been recommended or used for this study. For this study, effective stresses in Equation A4 were computed using assumed water tables and soil unit weights.

A3.0 TEST DRAINAGE CONDITION

The CPT loading rate is such that drained and undrained conditions exist during penetration of sands and clays, respectively. Partial drainage may occur in mixed soils. Lack of boundary drainage control during any in situ test complicates data analysis, especially in mixed soils, as both frictional and cohesive behavior can be exhibited during testing.

CPTU piezometric data indicate that minor differences in cone end bearing and friction ratio response can correspond with major changes in pore water pressure response during the test (Douglas and others, 1985). The complex volumetric strain field around the penetrometer (Davidson and Boghrat, 1983) precludes reliable geotechnical effective stress analysis of CPTU results in partially drained soil.

Empirical estimates of either drained or undrained parameters can be made in soils composed of mixtures of granular and fine grained particles. These parameters must not be combined - they are to be used alternatively. Combination of the drained and undrained parameters for geotechnical analysis will result in significant overestimation of in situ shear strength.

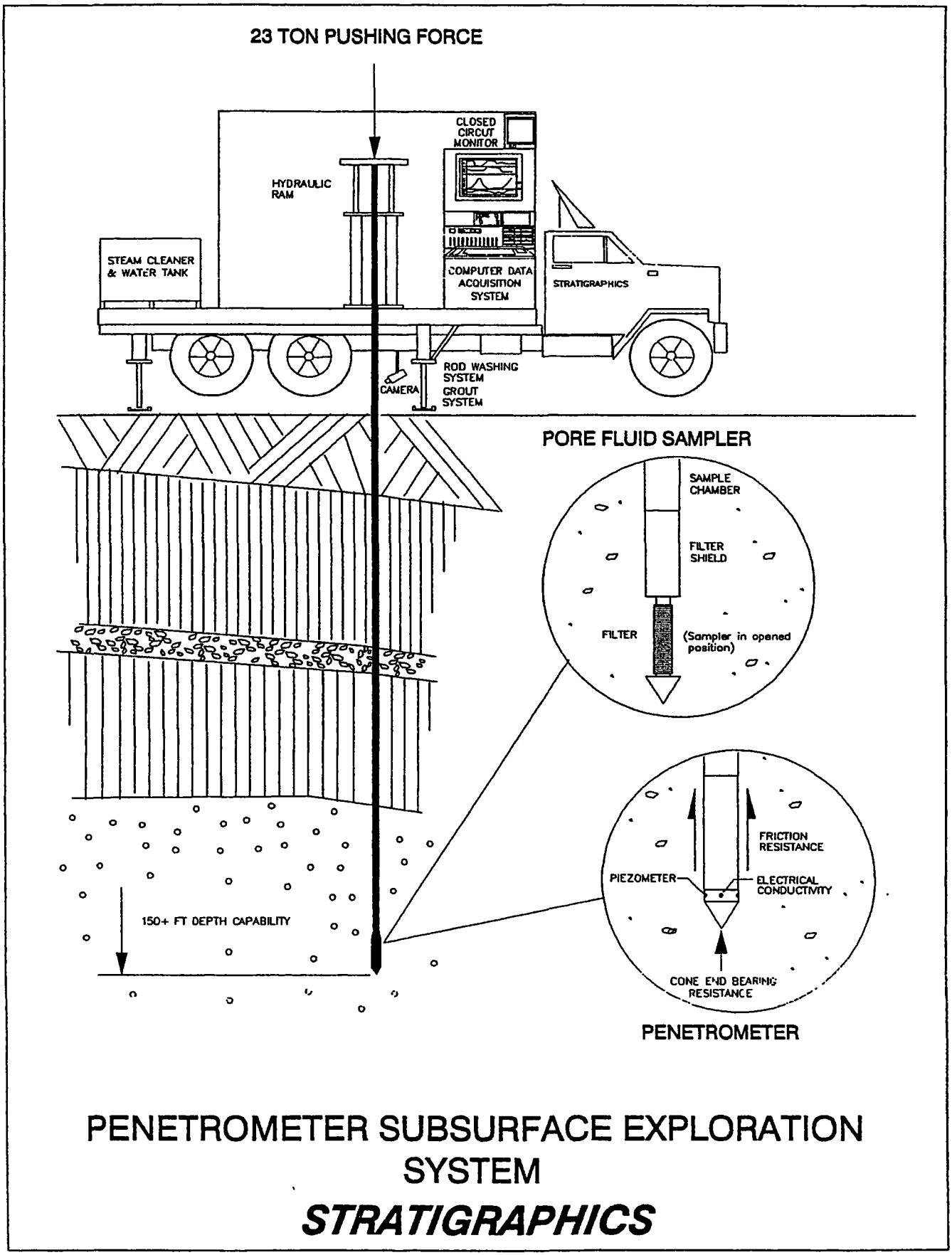
Structure rate of loading will help determine which geotechnical parameters, whether drained or undrained, should be appropriate for design use. Depending on project needs and extent of such soils at a site, geotechnical laboratory testing including CU tests with pore pressure measurements and consolidation tests will also be useful in assigning appropriate design parameters. Field instrumentation during construction using low volume change piezometers may be appropriate for some projects.

A4.0 RECOMMENDED PRACTICES

The STRATIGRAPHICS parameter evaluation program tracks the CPT data through a series of correlation charts, Figures A2 through A6. Parameters are computer evaluated and tabulated at discrete intervals. Some practices are recommended when reviewing tabulated data and correlated parameters:

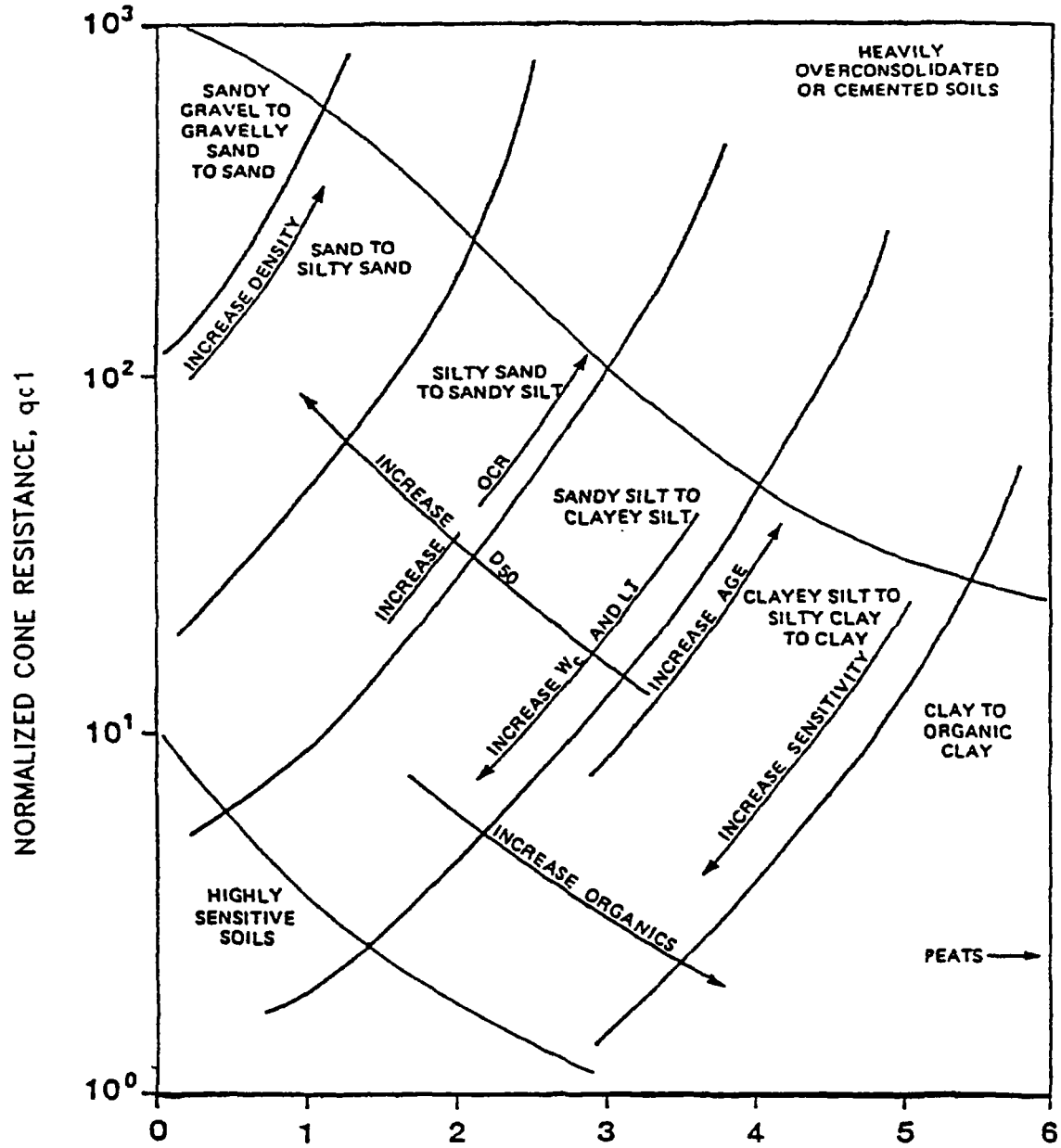
1) stratigraphic units should be defined on the basis of the continuous sounding logs and project requirements. The tabulations are then used to provide layer properties. Use of the tabulations without the review of the continuous sounding logs can lead to the choice of non-representative parameters, especially in interlayered deposits. It should be noted that taking discontinuous borehole soil samples also often provides a poor representation of subsurface conditions;
2) CPT correlations have been developed using empiricism. The empirical data base is world-wide, and includes decades of CPT experience. However, unique local conditions may differ from those in the global data base. Thus, the tabulations should be viewed as indicating trends rather than as the exact equivalent of specific laboratory tests performed under boundary and drainage controlled conditions; and
3) while CPT suffers from none of the effects of sample disturbance as found during drilled investigations, boundary conditions are not well defined during any in situ test such as CPT. The derived parameters are not intended to replace appropriate drilling and undisturbed sampling, other in situ and laboratory testing, and use of engineering judgment.

Review of CPT results and project requirements is used to define the need for additional information. Zones delineated by CPT (or, in fact, any other test) providing low factors of safety should be further investigated. Select undisturbed sampling followed by geotechnical triaxial and consolidation testing may be indicated for low strength cohesive or partially drained mixed soil strata. Monitoring wells may be installed or groundwater samples taken in CPT(U) identified high permeability strata during geo-environmental investigations. Laboratory and other test results can then be extrapolated across the site based on CPT(U) defined stratigraphy.



PENETROMETER SUBSURFACE EXPLORATION SYSTEM

STRATIGRAPHICS



SOIL BEHAVIOR TYPE CLASSIFICATION CHART

After Douglas and Olsen, 1981

STRATIGRAPHICS

Figure 2

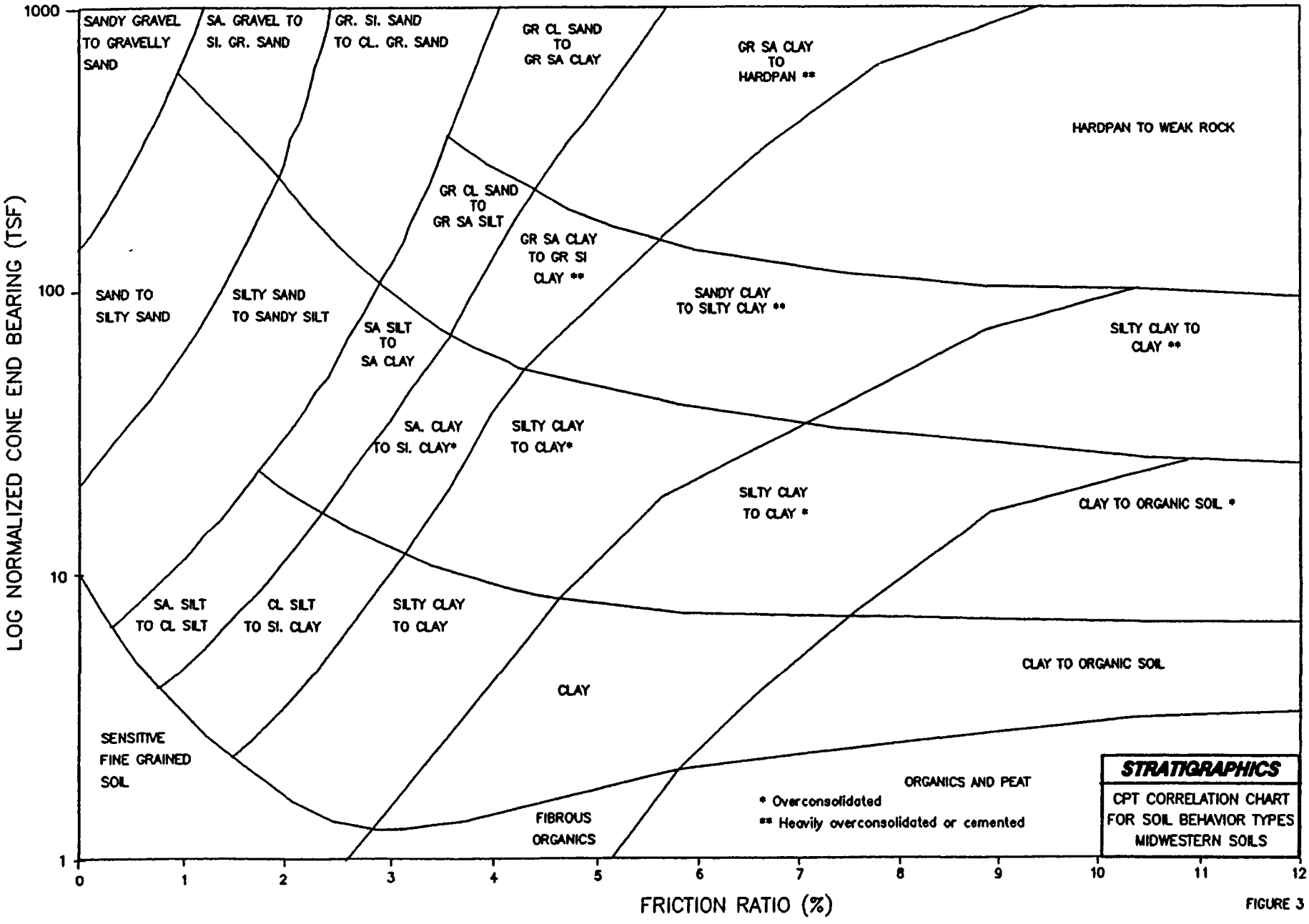
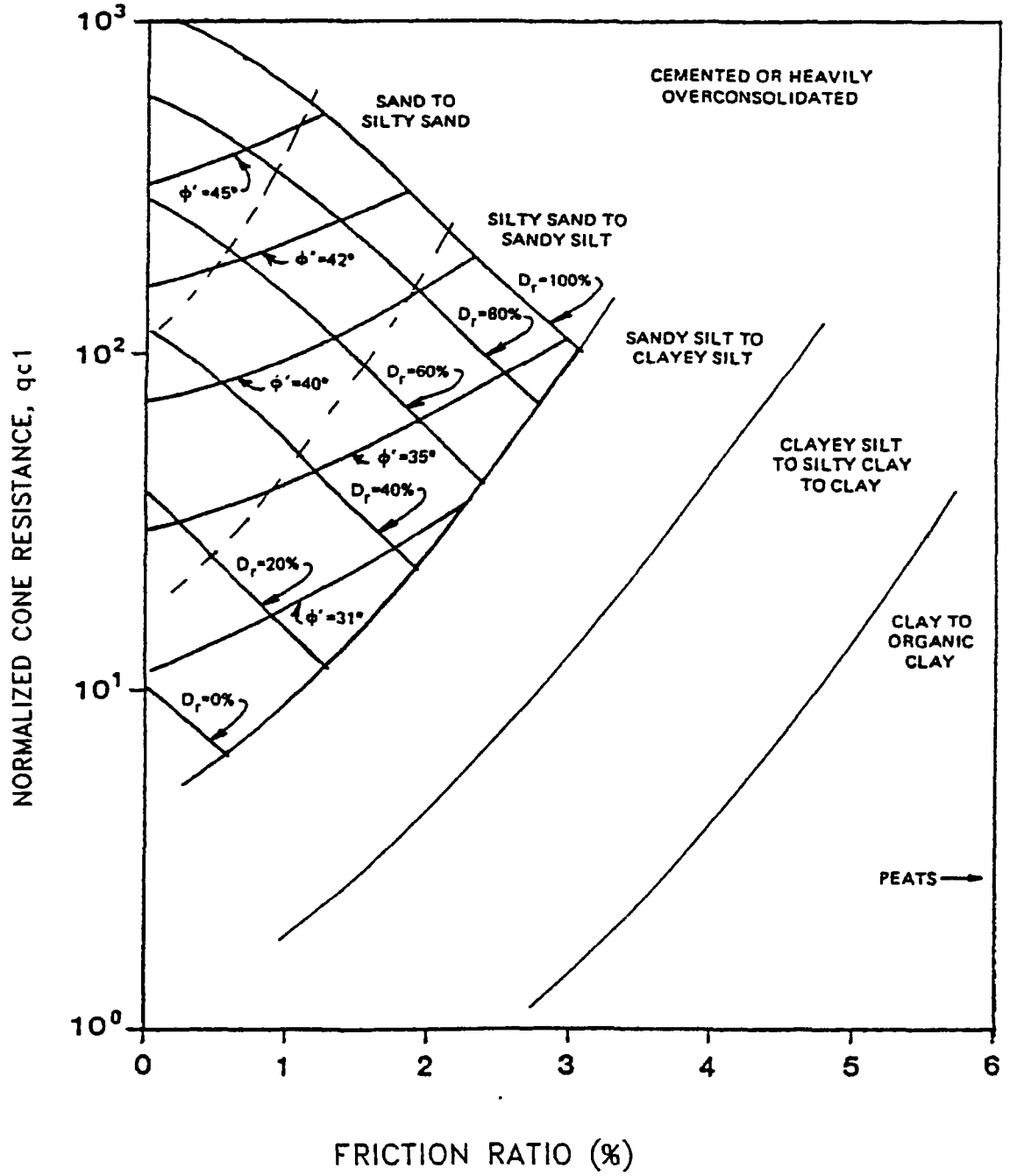

LOG NORMALIZED CONE END BEARING (TSF)
1000
100
10
1
0
1
2
3
4
5
6
7
8
9
10
11
12
FRICTION RATIO (%)
SANDY GRAVEL TO GRAVELLY SAND
SA. GRAVEL TO SI. GR. SAND
GR. SI. SAND TO CL. GR. SAND
GR CL SAND TO GR SA CLAY
GR SA CLAY TO HARDPAN **
HARDPAN TO WEAK ROCK
GR CL SAND TO GR SA SILT
GR SA CLAY TO GR SI CLAY **
SAND TO SILTY SAND
SILTY SAND TO SANDY SILT
SA SILT TO SA CLAY
SANDY CLAY TO SILTY CLAY **
SILTY CLAY TO CLAY **
SA. CLAY TO SI. CLAY*
SILTY CLAY TO CLAY*
SILTY CLAY TO CLAY *
CLAY TO ORGANIC SOIL *
SA. SILT TO CL SILT
CL SILT TO SI. CLAY
SILTY CLAY TO CLAY
CLAY TO ORGANIC SOIL
CLAY
SENSITIVE FINE GRAINED SOIL
ORGANICS AND PEAT
FIBROUS ORGANICS
* Overconsolidated
** Heavily overconsolidated or cemented
STRATIGRAPHICS
CPT CORRELATION CHART FOR SOIL BEHAVIOR TYPES MIDWESTERN SOILS

FIGURE 3

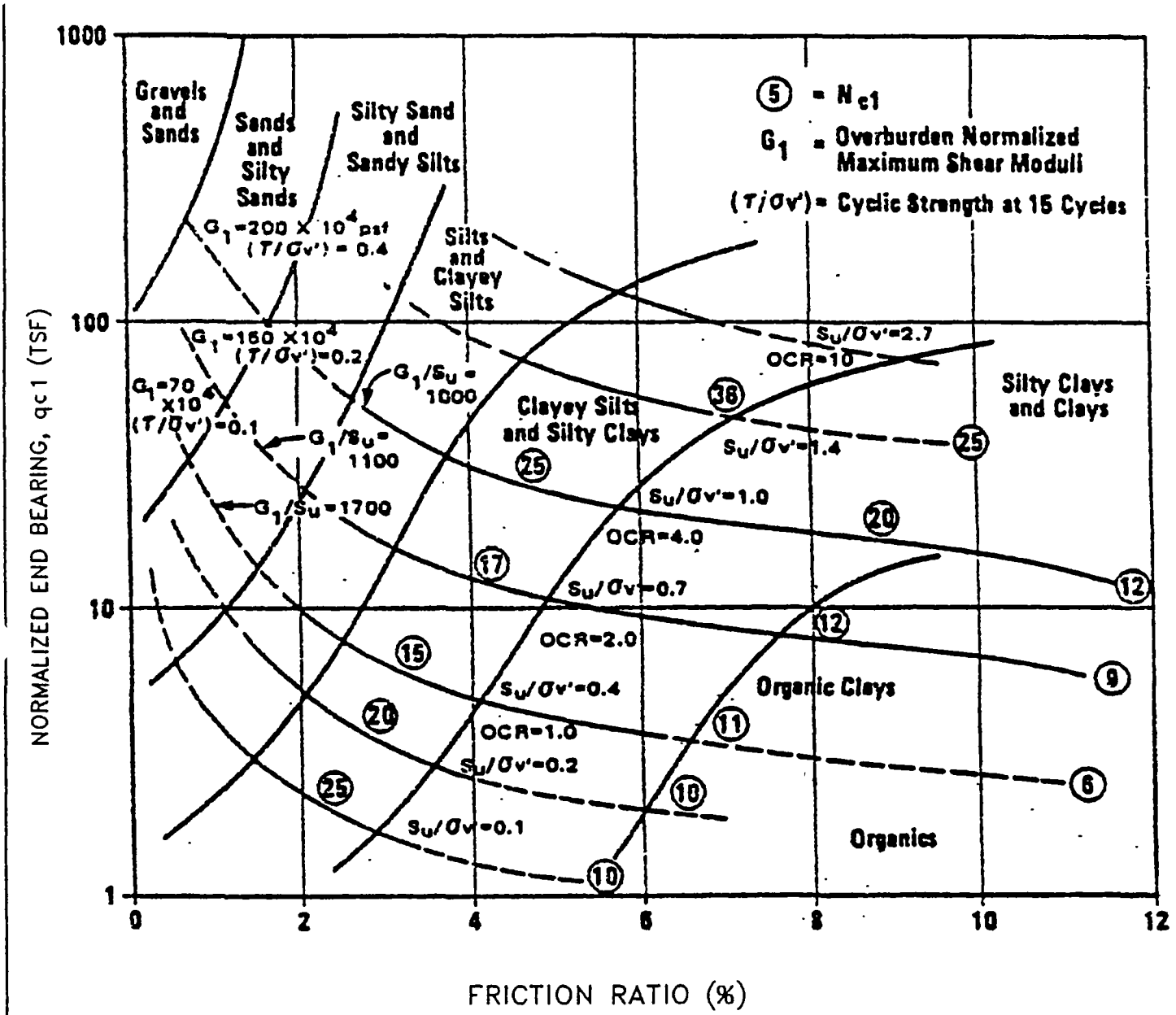


EXPANDED SOIL BEHAVIOR TYPE CLASSIFICATION CHART WITH EQUIVALENT OVERBURDEN NORMALIZED FRICTION ANGLE AND RELATIVE DENSITY TRENDS

After Douglas and Strutynsky, 1984

STRATIGRAPHICS

Figure 4



COMPOSITE TRENDS IN UNDRAINED SOIL PROPERTIES

After Douglas, Strutynsky, et. al., 1985

STRATIGRAPHICS

Figure 5

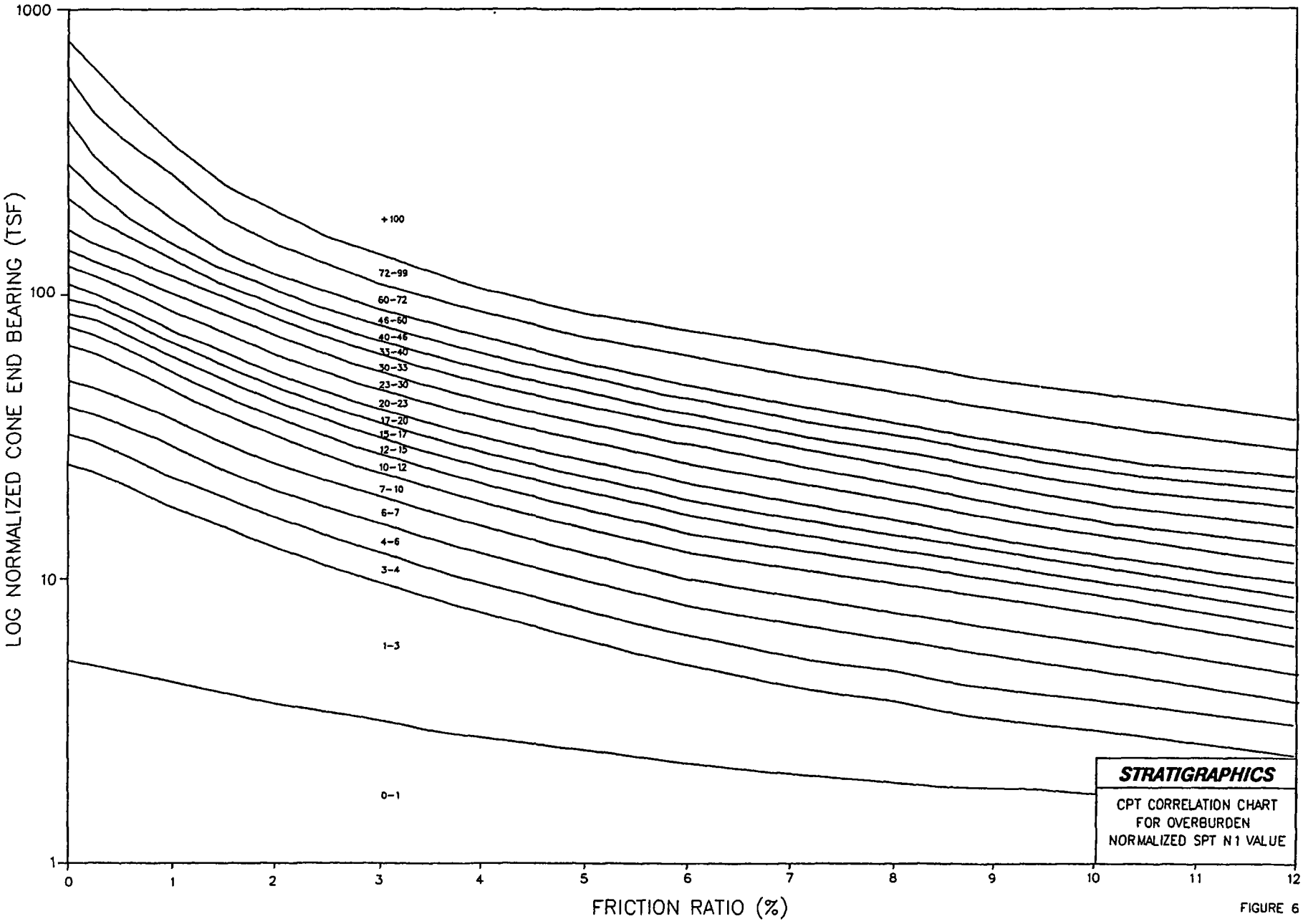
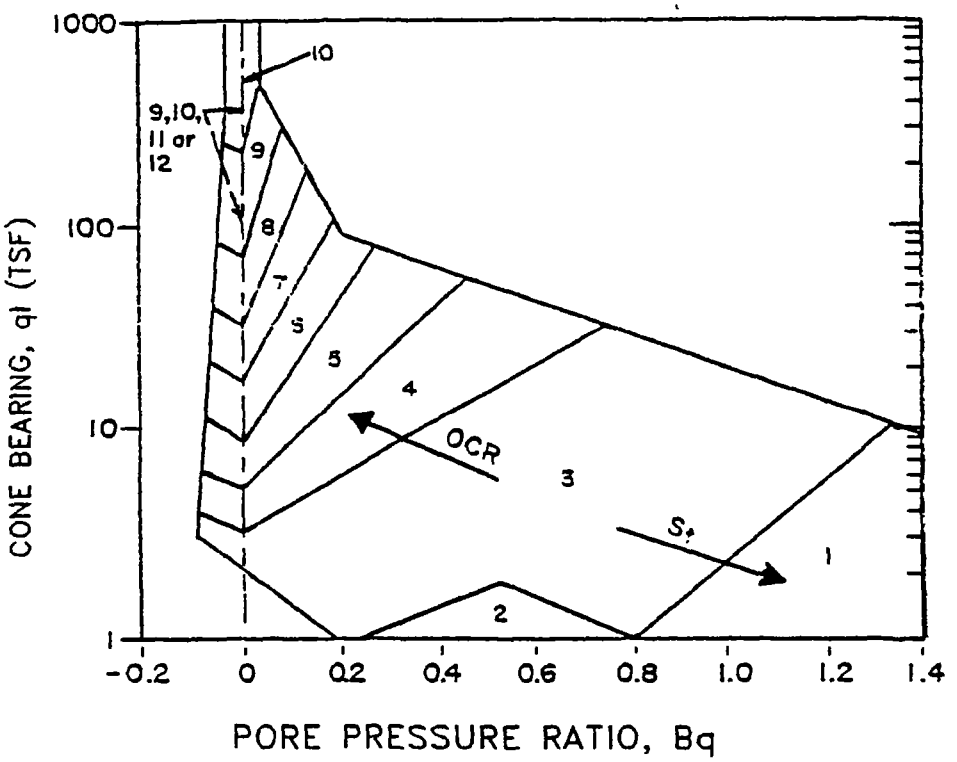

1000
100
10
1
LOG NORMALIZED CONE END BEARING (TSF)
+100
72-99
60-72
46-60
40-46
33-40
30-33
23-30
20-23
17-20
15-17
12-15
10-12
7-10
6-7
4-6
3-4
1-3
0-1
0
1
2
3
4
5
6
7
8
9
10
11
12
FRICTION RATIO (%)
STRATIGRAPHICS
CPT CORRELATION CHART
FOR OVERBURDEN
NORMALIZED SPT N1 VALUE

FIGURE 6



ZONE	SOIL BEHAVIOR TYPE
1	ORGANIC MATERIAL
2	CLAY
3	CLAY
4	SILTY CLAY TO CLAY
5	CLAYEY SILT TO SILTY CLAY
6	SANDY SILT TO CLAYEY SILT
7	SILTY SAND TO SANDY SILT
8	SAND TO SILTY SAND
9	SAND
10	GRAVELLY SAND TO SAND
11	VERY STIFF FINE GRAINED (*)
12	SAND TO CLAYEY SAND (*)
(*)	OVERCONSOLIDATED TO CEMENTED

After Robertson & Others, 1986

STRATIGRAPHICS

Figure 7

APPENDIX B

Excerpt from Baligh, M.M. and J. Levadoux, "Pore Pressure Dissipation After Cone Penetration," Department of Civil Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts 1980.

6.2.4 Evaluation of c_h (probe)

At a given degree of consolidation, the predicted horizontal coefficient of consolidation c_h (probe) is obtained from the expression

$$c_h \text{ (probe)} = R^2T/t \qquad (6.2)$$

where R is the radius of the cone shaft, t is the measured time to reach this degree of consolidation; and T is the time factor. Table 5.1 provides values of T for different probe types at various degrees of consolidation.

An analytical method {equivalent to the graphical method described in Section 6.2.3} to check the validity of the prediction method consists of determining c_h at different dissipation stages, i.e., different u. Large differences between c_h at various degrees of consolidation indicate an inadequate initial distribution of excess pore pressure or significant coupling, or creep behavior.

The estimated values of c_h (probe) at 50% dissipation can be used in foundation problems involving horizontal water flow due to unloading or reloading of clays above the maximum past pressure. For problems involving vertical water flow in the overconsolidated range, the vertical coefficient of consolidation, c_v(probe), can be estimated from the expression:

$$c_v \text{ (probe)} = (k_v/k_h)\, c_h \text{ (probe)} \qquad (6.3)$$

where k_v and k_h are the vertical and horizontal coefficients of permeability, respectively. Reliable estimates of the in situ anisotropy of clays as expressed by the ratio k_h/k_v is difficult to determine in the laboratory because of the effects of sample size, sample disturbance, ... etc. and is the subject of controversy (Rowe, 1972; Casagrande and Poulos, 1969). In situ tests to determine k_h/k_v are almost nonexistent. Table 6.2 provides rough estimates of k_h/k_v for different clays.

6.2.5 Prediction of k_h (probe)

Approximate estimates of the horizontal coefficient of permeability, k_h (probe), can be obtained from the expression:

$$k_h \text{ (probe)} = (g_w/2.3s_{vo}) * RR(\text{probe}) * c_h \text{ (probe)} \qquad (6.4)$$

where s_{vo} is the initial vertical effective stress (kg/cm^2); g_w is the unit weight of water ($=10^{-3}$ kg/cm^3); and, RR(probe) is the recompression ratio during early stages of consolidation around the probe (50% dissipation, say).

Results in both the upper and lower Boston Blue Clays indicate that:

$$\text{the average RR(probe)} = 10^{-2} \qquad (6.5)$$

$$\text{and generally } 0.5 * 10^{-2} < RR(\text{probe}) < 2 * 10^{-2} \qquad (6.6)$$

6.2.6 Prediction of c_v(NC)

r foundation clays consolidated in the normally consolidated range, estimates of the coefficients of consolidation can be obtained from c_h (probe) by means of the expressions:

$$c_h(NC) = (RR(probe)/CR) * c_h (probe) \quad (6.7)$$

for horizontal water flow, and

$$c_v(NC) = (RR(probe)/CR) * (k_v/k_h) * c_h(probe) \quad (6.8)$$

for vertical water flow.

The compression of ratio CR is the average slope of the strain vs. log effective stress plot in the appropriate effective stress range expected during consolidation of the foundation clay. Values of CR should be obtained from good quality samples carefully tested in the laboratory. Table 6.2 provides rough estimates of CR based on empirical correlation with index properties of various clays.

Table 6.2 Empirical Correlation and Typical Properties of Clays

1. Compression Ratio CR (from Ladd, 1973)

$CR = C_c/1+e_o$ = slope of the strain vs. log stress curve
e_o = initial void ratio
c_c = virgin compression index = slope of e vs. log stress
w_L = liquid limit
w_N = natural water content

$c_c = 0.009 (w_L\% - 10\%)$	Terzaghi and Peck (1967)
$C_c = 0.54 (e_o - 0.35)$	Nishida (1958)
$C_c = 0.01$ to $0.15 (w_N\%)$	MPMR (1958)
$C_c = 0.6 (e_o - 1)$ for $e_o < 6$	
$C_c = 0.6 (e_o - 1)$ for $e_o < 6$	
$C_c = 0.85 (e_o - 2)$ for $6 < e_o < 14$	Kapp, (1966)

2. Anisotropic Permeability of Clays (from Ladd, 1976)

Nature of Clay	k_h/k_v
1. No evidence of layering	1.2 +- 0.2
2. Slight layering, e.g., sedimentary clays with occasional silt dustings to random lenses	2 to 5
3. Varved clays in northeastern U.S.	10 +/-5

APPENDIX C

(NOT INCLUDED IN THIS REPORT)

APPENDIX D

GPS General Overview

The Global Positioning System (GPS) may be viewed as continuous radio wave transmissions of extremely accurate (1 second in 30,000 to 300,000 years) timing signals from a constellation of earth orbiting satellites (space vehicles – SV) to a receiver (station) on earth. The time delay from satellite transmission of the timing signal to its reception, along with the velocity of wave propagation (speed of light through the atmosphere) is used to calculate the distance from a satellite to the receiver (velocity * time = distance). Using spherical trigonometry with the calculated distance to at least 4 different satellites, and knowing the precise orbital path of each satellite, the exact position (x, y, z coordinates or latitude, longitude and elevation) of the receiver can be calculated. Satellite orbital information is transmitted along with timing signals from each satellite.

There are three major sources of error in GPS measurements. First is an inadequate number of satellites - a minimum of 4 satellites is required for accurate x, y, and z positioning. Second is errors in broadcast ephemeris, propagation errors through the ionosphere, and receiver clock biases and noise. The third is the intentional corruption of the civilian clear access/coarse acquisition (CA) GPS signal code performed by the US Department of Defense (DOD) for purposes of national defense. The CA signal code corruption is called *selective availability* (*SA*).

The military (encrypted) portion of GPS has an autonomous accuracy of at least 18 meters horizontally and 30 meters vertically, adequate for the original purpose of GPS - targeting sites with nuclear weapons. With selective availability (SA) corruption of signals, the civilian (CA) portion of the GPS system has an autonomous accuracy of about 100 meters horizontally, and 160 meters vertically. Inexpensive, consumer receivers that only use CA code have this low level of accuracy.

Intermediate cost GPS receivers are available that incorporate a second antenna which allows additional, non-GPS radio wave differential corrections to GPS, allowing horizontal accuracy of about 10 meters. These additional radio wave corrections are available for free from US Coast Guard surface stations, located along various navigable waterways. Subscription (for fee) services based on commercial satellite or cellular tower transmission of these additional radio wave corrections are also available.

Higher cost differential receivers have been developed for accurate surveying purposes that not only use the encoded GPS timing signal, but also account for phasing of the radio frequency carrier wave. These code and carrier phase differential receivers can provide positional accuracy on the order of centimeters. This requires post-processing of recorded GPS data with corrections from a fixed GPS base station. These types of high accuracy receivers with post processing software are used by STRATIGRAPHICS for surveying.

To correct for selective availability (SA) and atmospheric errors, one uses at least two receivers. One receiver (or BASE station) is fixed in position during the survey period, and the other (REMOTE station) is located at the points requiring surveying. Any apparent (and false) motion of the fixed BASE station, due to SA or atmospheric perturbations, is used in corrections to the REMOTE station data set. GPS software is then used to post-process the data, combining satellite measurements from the two receivers to achieve accurate surveying measurements. The accuracy of these post-processed, differentially corrected GPS positional measurements is about 1 ppm of the baseline length (straight-line distance between BASE and REMOTE stations). With a baseline length of 1 mile, this error can be theoretically as low as 2 millimeters.

APPENDIX K

LAKE MICHIGAN LEVELS

Previous Month's Levels in Feet IGLD-85

PROVISIONAL

GREAT LAKES DAILY LEVELS IN FEET (IGLD 1985) -- OCT 2000

DAY	SUPERIOR*		MICHIGAN-HURON*		ST. CLAIR*		ERIE*		ONTARIO*	
	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN
1	601.1		577.6		573.7		571.0		245.1	
2	601.1		577.6		573.6		571.0		245.0	
3	601.1		577.6		573.6		571.0		245.0	
4	601.1	601.1	577.5	577.6	573.7	573.7	571.0	571.0	245.0	245.0
5	601.1		577.5		573.8		571.1		245.0	
6	601.1		577.5		573.8		571.0		245.0	
7	601.1		577.5		573.6		570.9		245.0	
8	601.1	601.1	577.4	577.5	573.7	573.7	571.0	571.0	244.9	245.0
9	601.1		577.4		573.6		571.0		244.9	
10	601.0		577.4		573.6		570.9		244.9	
11	601.0		577.4		573.5		570.9		244.8	
12	601.0	601.1	577.4	577.5	573.5	573.6	570.9	571.0	244.8	245.0
13	601.0		577.4		573.4		570.9		244.8	
14	601.1		577.4		573.4		570.9		244.8	
15	601.0		577.4		573.4		570.9		244.8	
16	601.0	601.1	577.4	577.5	573.5	573.6	570.9	571.0	244.8	244.9
17	601.0		577.4		573.5		570.9		244.8	
18	601.0		577.3		573.4		570.9		244.8	
19	601.0		577.3		573.4		570.9		244.8	
20	601.0	601.1	577.3	577.4	573.4	573.6	570.8	570.9	244.8	244.9
21	601.0		577.3		573.4		570.9		244.7	
22	601.0		577.3		573.4		570.9		244.7	
23	601.0		577.3		573.4		570.8		244.7	
24	601.0	601.0	577.3	577.4	573.4	573.5	570.8	570.9	244.6	244.8
25	601.0		577.3		573.4		570.9		244.6	
26	601.0		577.3		573.4		570.9		244.6	
27	601.0		577.3		573.4		570.8		244.6	
28	601.0	601.0	577.2	577.4	573.6	573.5	570.9	570.9	244.6	244.8
29	601.0		577.2		573.4		570.8		244.5	
30	601.0		577.2		573.4		570.8		244.5	
31	601.0	601.0	577.2	577.4	573.3	573.5	570.8	570.9	244.5	244.8
OCTOBER										
MAX	603.4(1985)		582.3(1986)		577.3(1986)		574.0(1986)		246.8(1945)	
MIN	600.7(1925)		576.4(1964)		571.8(1934)		568.6(1934)		242.2(1934)	
AVG 1918-1998	601.2		579.1		574.2		571.1		244.8	
AVG LAST YEAR	601.6		577.9		573.7		570.8		244.3	
AVG LAST MONTH	601.3		577.8		573.9		571.2		245.4	

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Previous Month's Levels in Feet IGLD-85

PROVISIONAL

GREAT LAKES DAILY LEVELS IN FEET (IGLD 1985) -- NOV 2000

DAY	SUPERIOR*		MICHIGAN-HURON*		ST. CLAIR*		ERIE*		ONTARIO*	
	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN
1	601.0		577.2		573.3		570.8		244.4	
2	600.9		577.2		573.2		570.7		244.4	
3	601.0		577.2		573.2		570.7		244.4	
4	601.0	601.0	577.1	577.2	573.2	573.2	570.7	570.7	244.4	244.4
5	600.9		577.1		573.2		570.7		244.4	
6	600.9		577.1		573.2		570.7		244.4	
7	600.9		577.0		573.2		570.7		244.3	
8	601.0	600.9	577.1	577.1	573.1	573.2	570.7	570.7	244.3	244.4
9	601.0		577.1		573.2		570.7		244.3	
10	601.0		577.1		573.2		570.6		244.4	
11	601.0		577.1		573.3		570.7		244.4	
12	601.0	601.0	577.1	577.1	573.3	573.2	570.7	570.7	244.4	244.4
13	600.9		577.1		573.1		570.6		244.4	
14	601.0		577.1		572.9		570.5		244.3	
15	600.9		577.1		572.9		570.5		244.3	
16	601.0	601.0	577.1	577.1	572.8	573.2	570.5	570.6	244.3	244.4
17	600.9		577.1		572.9		570.4		244.3	
18	600.9		577.1		572.8		570.4		244.2	
19	600.9		577.1		572.8		570.4		244.3	
20	600.9	600.9	577.0	577.1	572.6	573.1	570.2	570.6	244.2	244.3
21	600.9		577.0		572.7		570.3		244.2	
22	600.9		577.0		572.7		570.3		244.2	
23	600.8		577.0		572.8		570.4		244.2	
24	600.8	600.9	577.0	577.1	572.9	573.0	570.4	570.5	244.2	244.3
25	600.8		577.0		573.0		570.4		244.2	
26	600.8		576.9		573.0		570.4		244.2	
27	600.8		576.9		572.9		570.4		244.3	
28	600.8	600.9	576.9	577.1	572.8	573.0	570.3	570.5	244.3	244.3
29	600.8		576.9		572.9		570.4		244.3	
30	600.8	600.9	576.9	577.1	573.0	573.0	570.4	570.5	244.3	244.3
NOVEMBER										
MAX	603.3(1985)		582.0(1986)		576.8(1986)		573.7(1986)		246.7(1945)	
MIN	600.4(1925)		576.3(1964)		571.5(1934)		568.2(1934)		242.0(1934)	
AVG 1918-1998	602.0		578.9		573.9		570.8		244.6	
AVG LAST YEAR	601.4		577.6		573.3		570.6		244.2	
AVG LAST MONTH	601.1		577.4		573.5		570.9		244.8	

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Previous Month's Levels in Feet IGLD-85

PROVISIONAL

GREAT LAKES DAILY LEVELS IN FEET (IGLD 1985) -- DEC 2000

DAY	SUPERIOR*		MICHIGAN-HURON*		ST. CLAIR*		ERIE*		ONTARIO*	
	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN	DAILY MEAN	RUNNING MEAN
1	600.8		576.9		573.1		570.4		244.3	
2	600.7		576.9		573.1		570.4		244.3	
3	600.7		576.9		573.0		570.4		244.3	
4	600.7	600.7	577.0	576.9	572.8	573.0	570.3	570.4	244.3	244.3
5	600.8		576.8		572.7		570.2		244.2	
6	600.7		576.9		572.7		570.2		244.2	
7	600.7		576.8		572.8		570.3		244.2	
8	600.7	600.7	576.8	576.9	572.8	572.9	570.3	570.3	244.2	244.3
9	600.6		576.8		572.8		570.3		244.2	
10	600.7		576.8		572.8		570.3		244.2	
11	600.6		576.8		573.0		570.4		244.2	
12	600.6	600.7	576.7	576.8	573.0	572.9	570.3	570.3	244.3	244.2
13	600.6		576.8		573.1		570.4		244.3	
14	600.6		576.8		573.2		570.4		244.3	
15	600.6		576.8		573.2		570.4		244.3	
16	600.5	600.7	576.8	576.8	573.2	572.9	570.4	570.3	244.3	244.3
17	600.7		576.7		573.1		570.3		244.3	
18	600.6		576.8		573.1		570.4		244.3	
19	600.6		576.8		573.3		570.4		244.4	
20	600.6	600.6	576.8	576.8	573.3	573.0	570.5	570.3	244.4	244.3
21	600.5		576.8		573.4		570.4		244.4	
22	600.6		576.8		573.5		570.4		244.4	
23	600.5		576.8		573.7		570.4		244.4	
24	600.6	600.6	576.7	576.8	573.9	573.1	570.4	570.4	244.4	244.3
25	600.5		576.8		574.0		570.3		244.4	
26	600.5		576.8		574.1		570.3		244.4	
27	600.5		576.7		574.1		570.3		244.4	
28	600.5	600.6	576.7	576.8	574.1	573.2	570.3	570.3	244.4	244.3
29	600.5		576.7		574.1		570.2		244.4	
30	600.5		576.7		574.0		570.3		244.4	
31	600.5	600.6	576.7	576.8	574.0	573.3	570.3	570.3	244.4	244.3
DECEMBER										
MAX	603.1(1985)		581.6(1986)		576.8(1986)		573.8(1986)		246.7(1945)	
MIN	600.1(1925)		576.2(1964)		571.7(1964)		568.2(1934)		241.9(1934)	
AVG 1918-1998	601.8		578.7		573.9		570.8		244.5	
AVG LAST YEAR	601.2		577.4		573.2		570.4		244.3	
AVG LAST MONTH	601.0		577.1		573.0		570.1		244.3	

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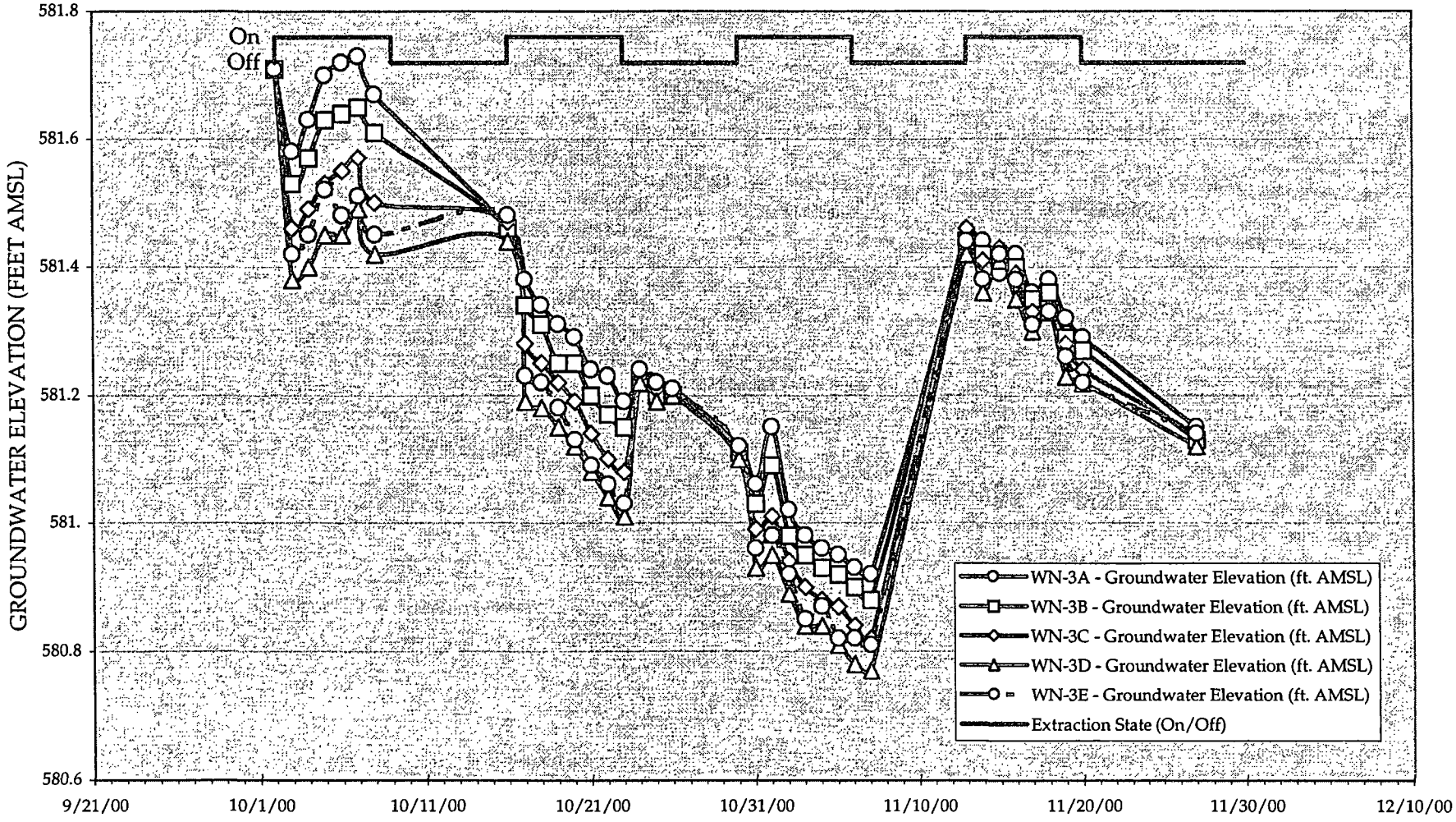
APPENDIX L

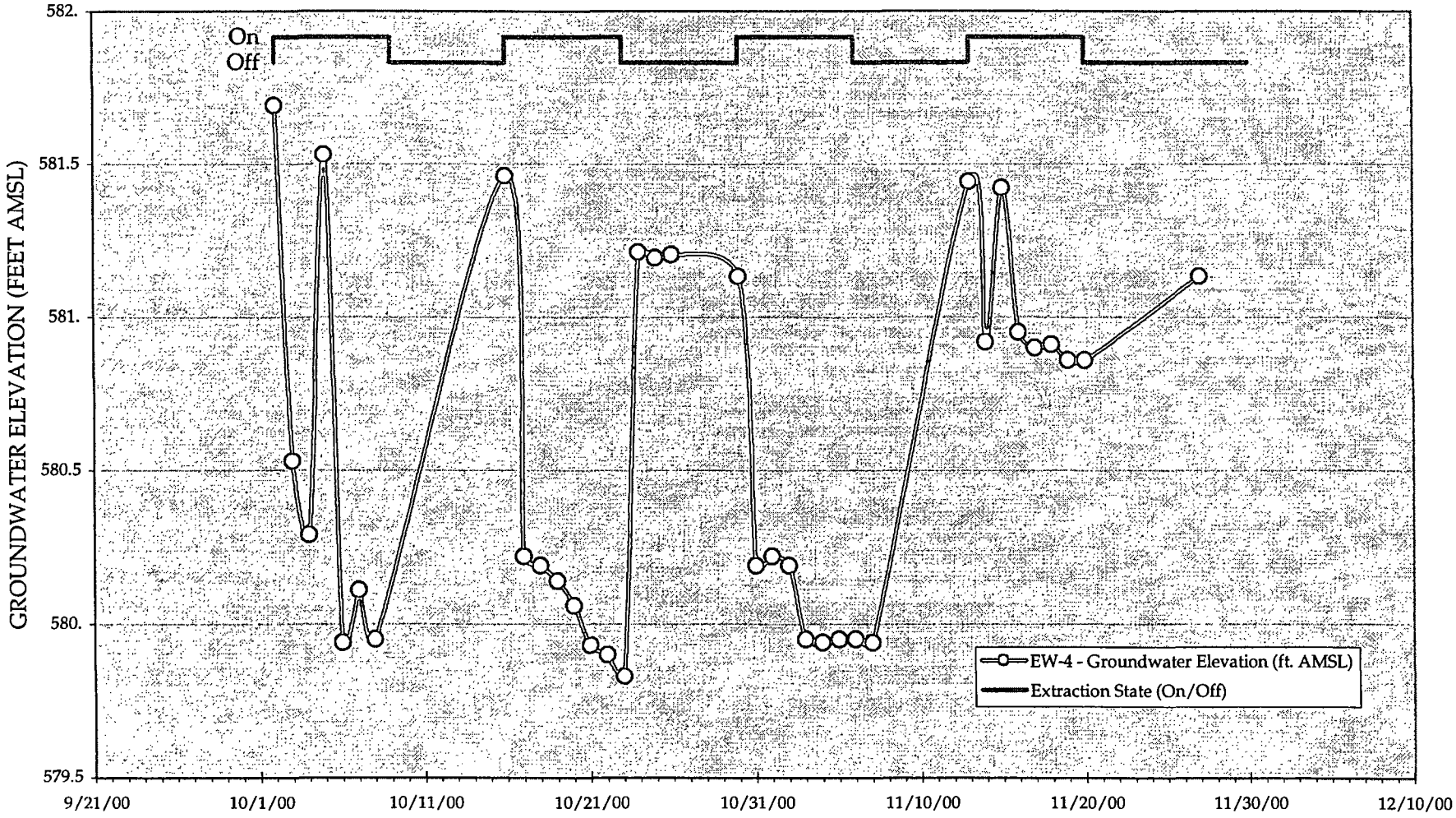
HYDROGRAPHS

GRAPH 1
EXTRACTION UNIT - GROUNDWATER ELEVATIONS
WELLS WN-3A, WN-3B, WN-3C, WN-3D, WN-3E
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

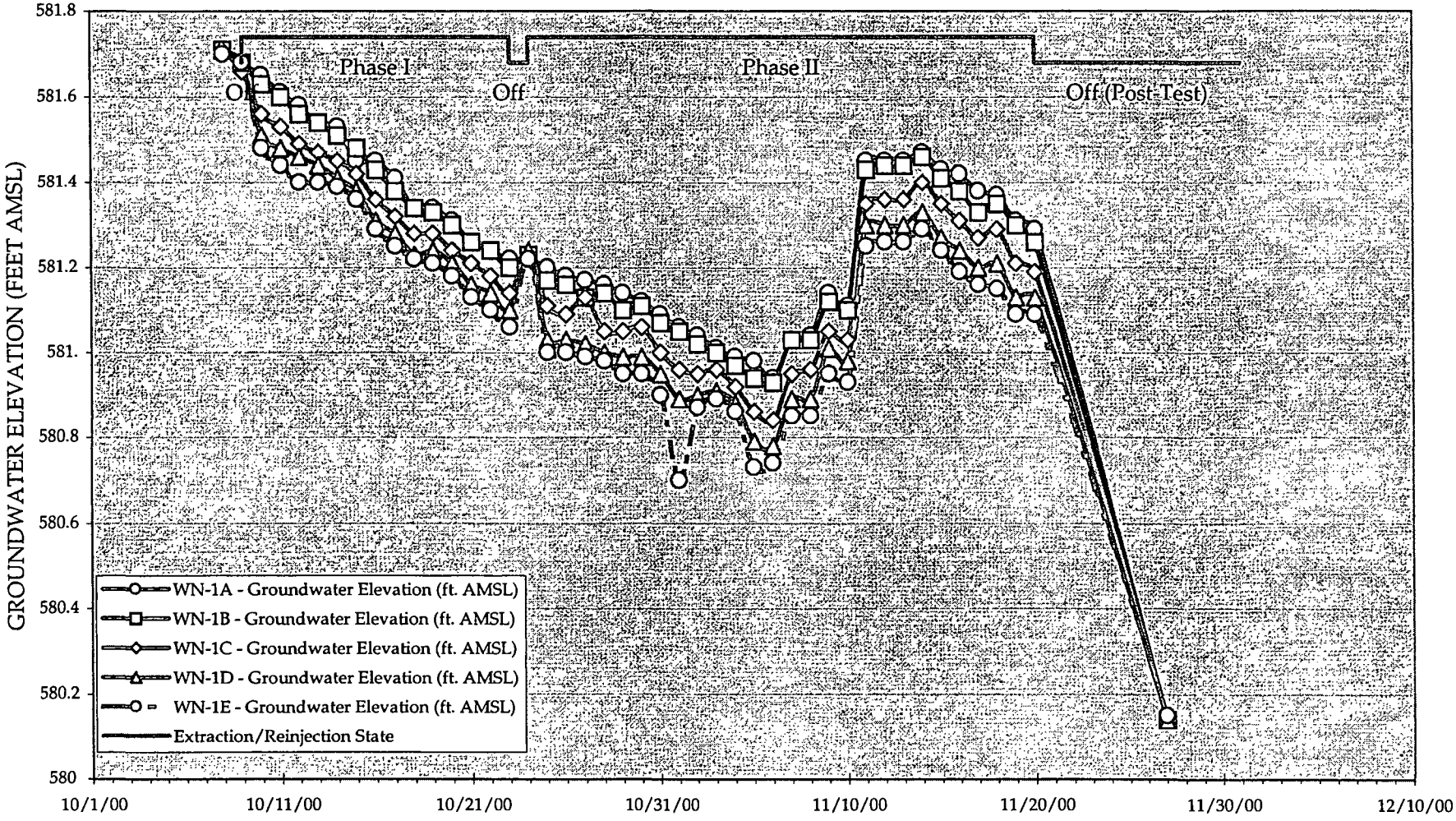


15670-App-L-hydrographs xls: WN3 Hydro
3/22/01 9 40 AM

GRAPH 2
EXTRACTION UNIT - GROUNDWATER ELEVATIONS
WELL EW-4
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

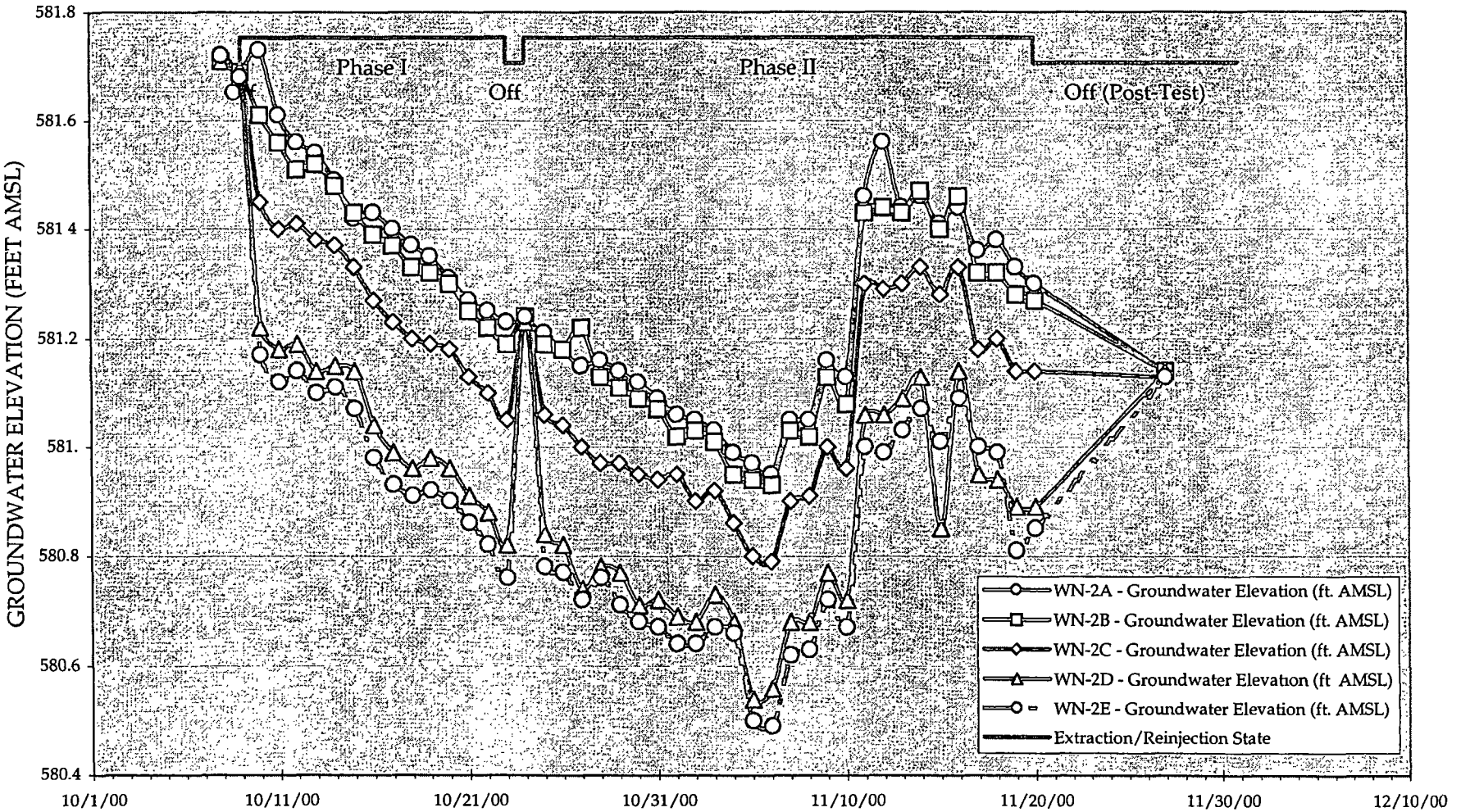


GRAPH 3
EXTRACTION/REINJECTION UNIT - GROUNDWATER ELEVATIONS
WELLS WN-1A, WN-1B, WN-1C, WN-1D, WN-1E
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

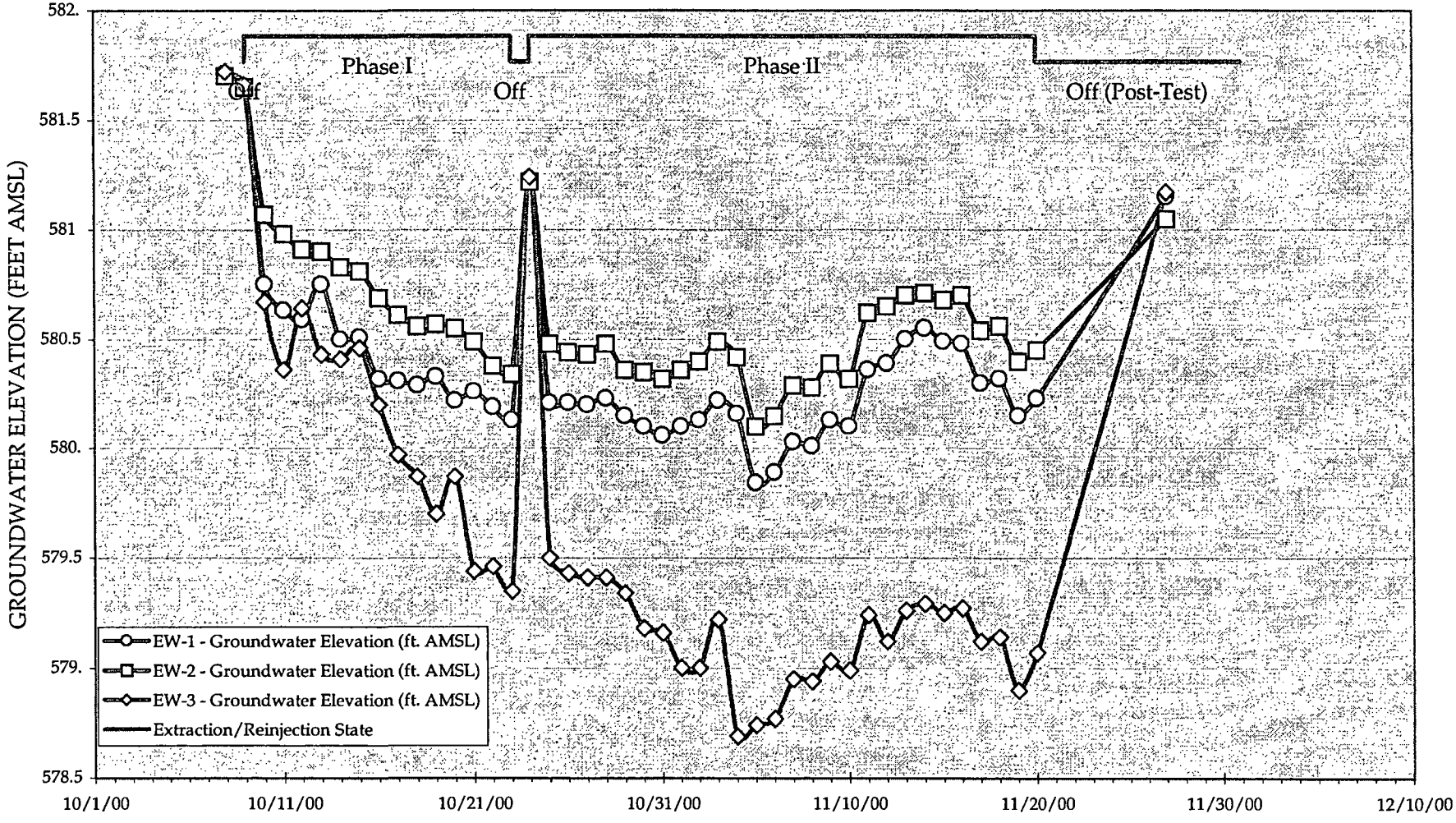


15670-App-L-hydrographs.xls WN1 Hydro
3/22/01 9 40 AM

GRAPH 4
EXTRACTION/REINJECTION UNIT - GROUNDWATER ELEVATIONS
WELLS WN-2A, WN-2B, WN-2C, WN-2D, WN-2E
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

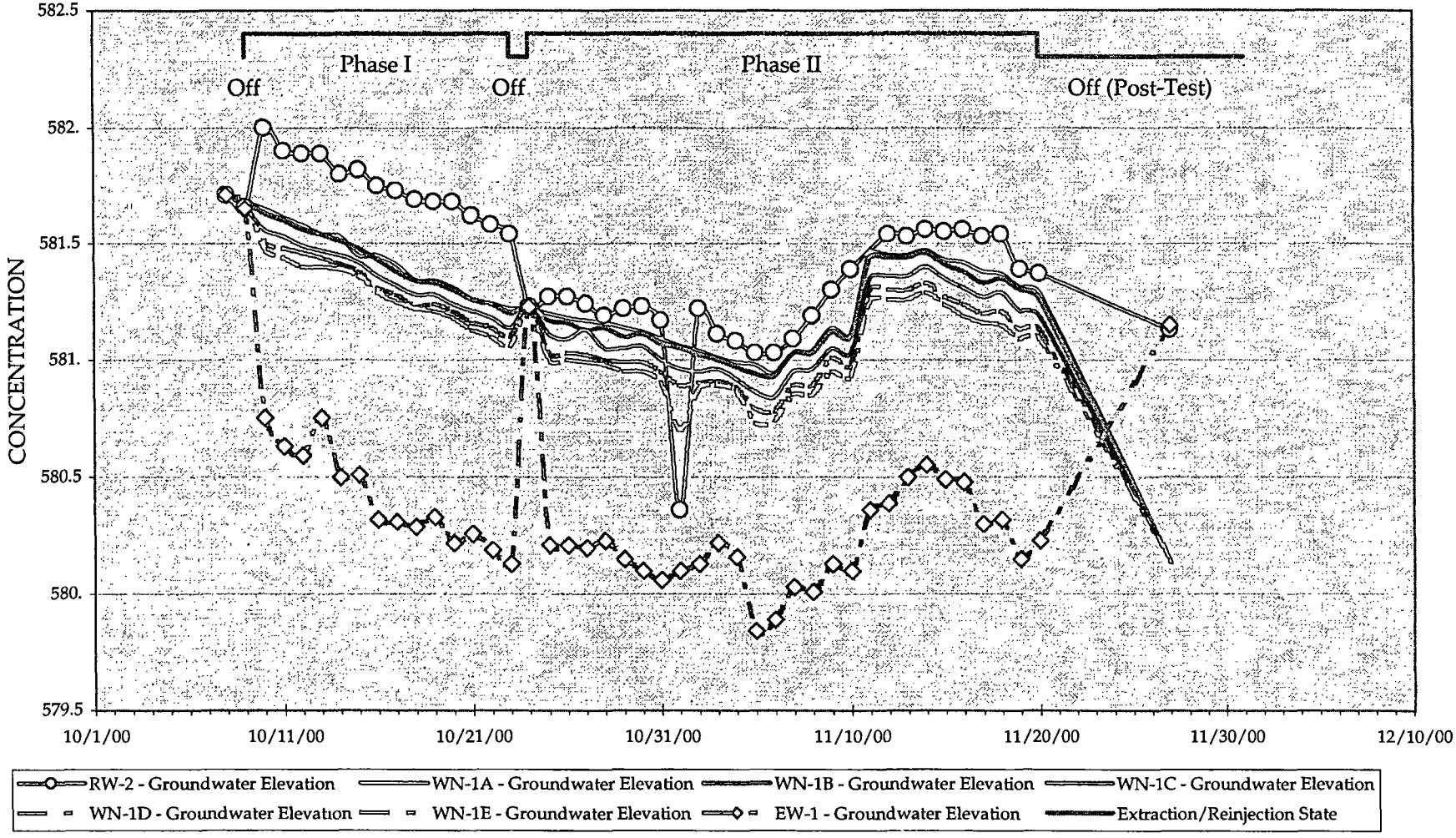


GRAPH 5
EXTRACTION/REINJECTION UNIT - GROUNDWATER ELEVATIONS
WELLS EW-1, EW-2, EW-3
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



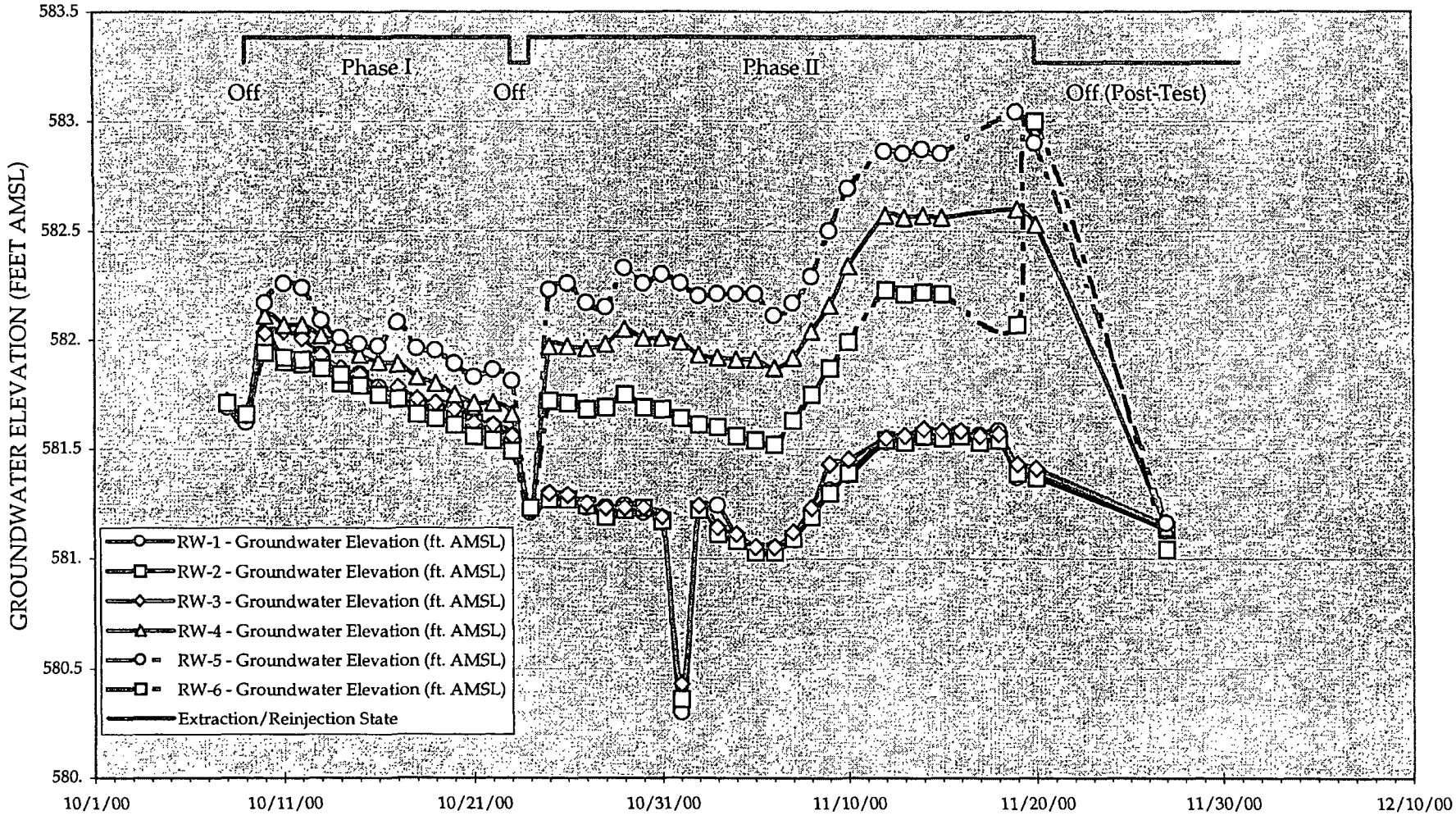
15670-App-L-hydrographs xls EW123 Hydro
3/22/01 9 41 AM

GRAPH 6
EXTRACTION/REINJECTION UNIT - GROUNDWATER ELEVATIONS
WELLS RW-2, WN-1A, WN-1B, WN-1C, WN-1D, WN-1E, EW-1
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



15670-App-L-hydrographs xls. EW1WN1RW2 Hydro
3/22/01 9 41 AM

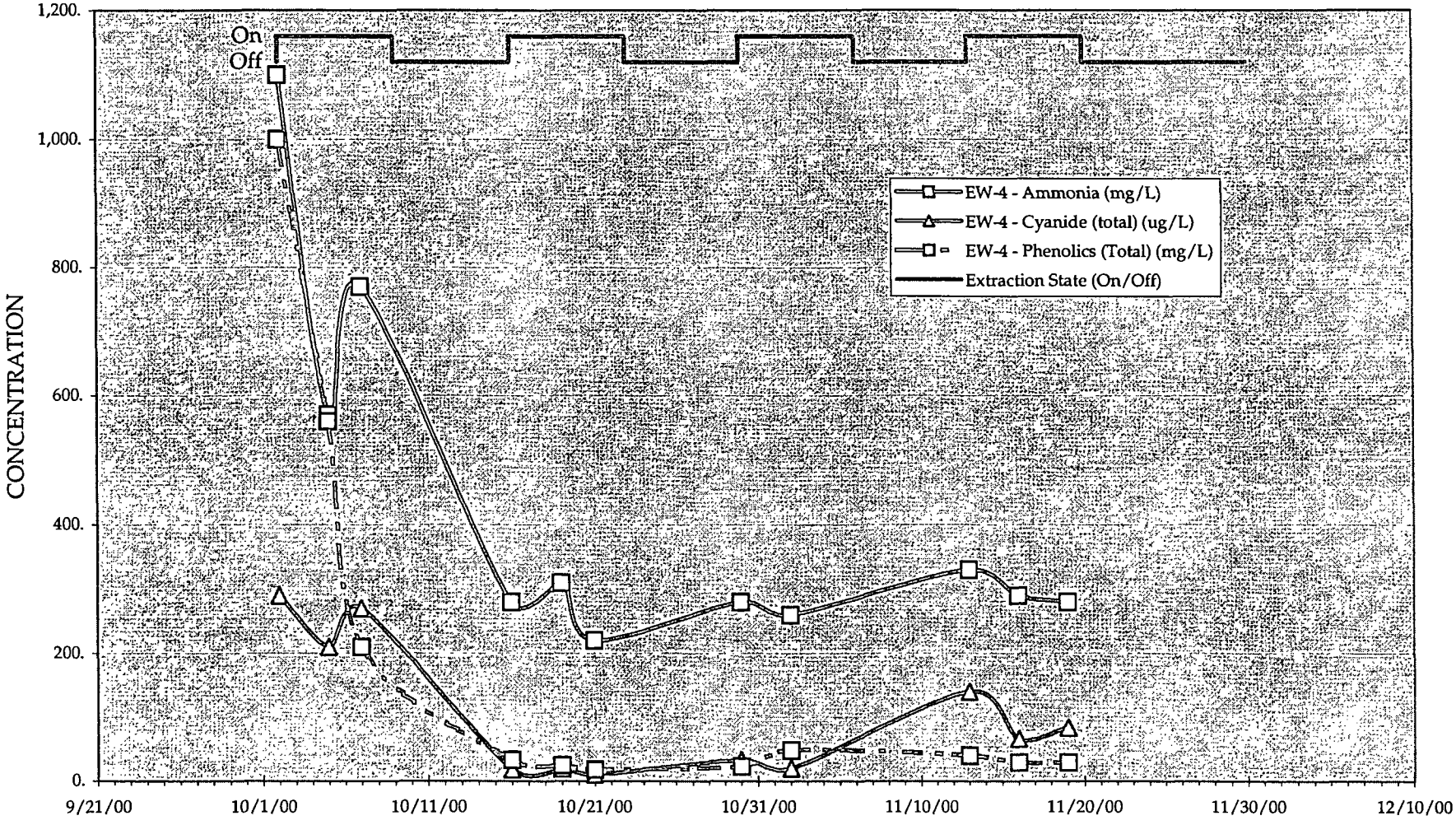
GRAPH 7
EXTRACTION/REINJECTION UNIT - GROUNDWATER ELEVATIONS
WELLS RW-1, RW-2, RW-3, RW-4, RW-5, RW-6
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



APPENDIX M

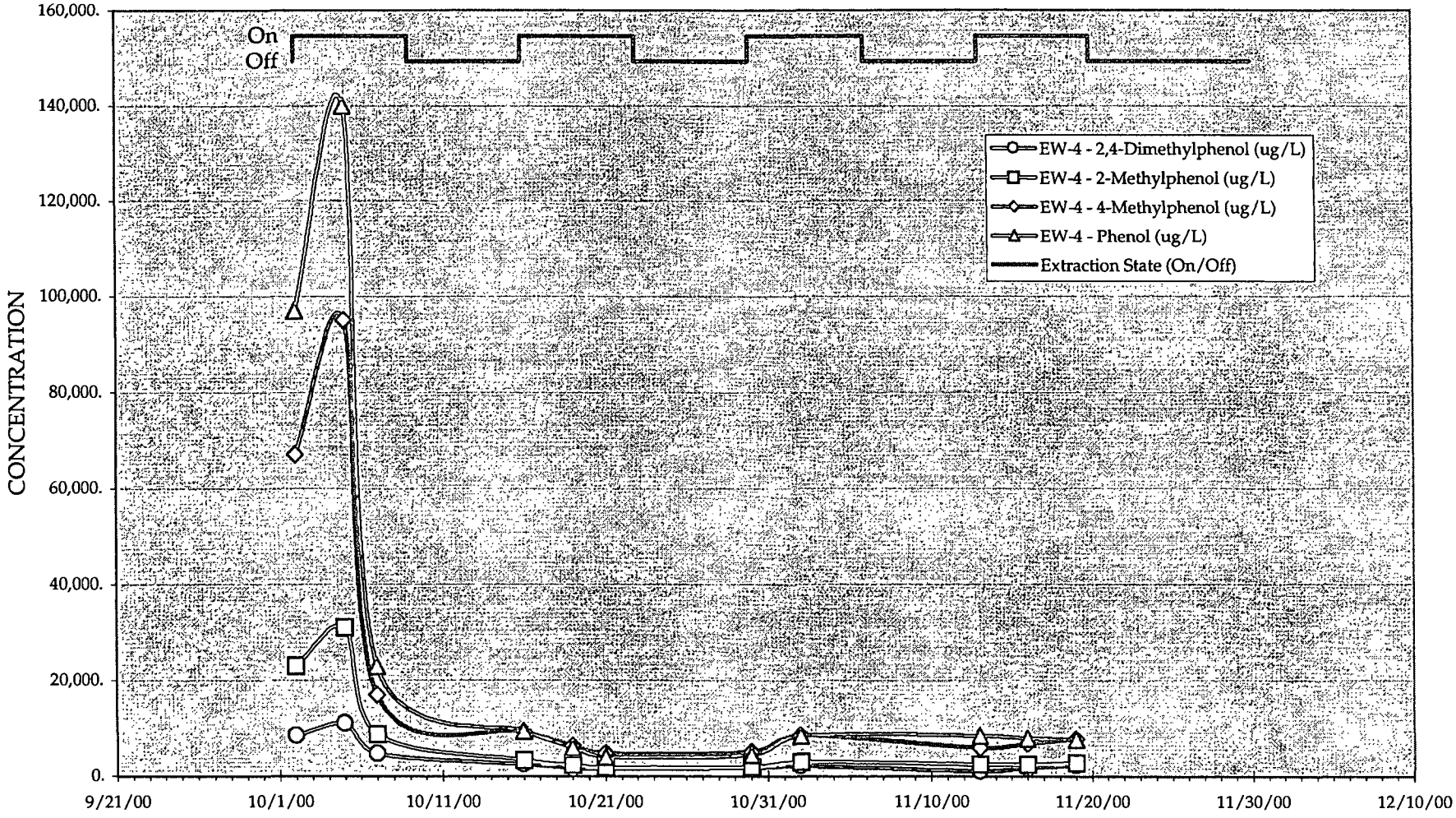
E UNIT GRAPHS

GRAPH 1
EXTRACTION UNIT - EW-4 ANALYTICAL DATA
AMMONIA, CYANIDE (TOTAL), PHENOLICS (TOTAL)
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



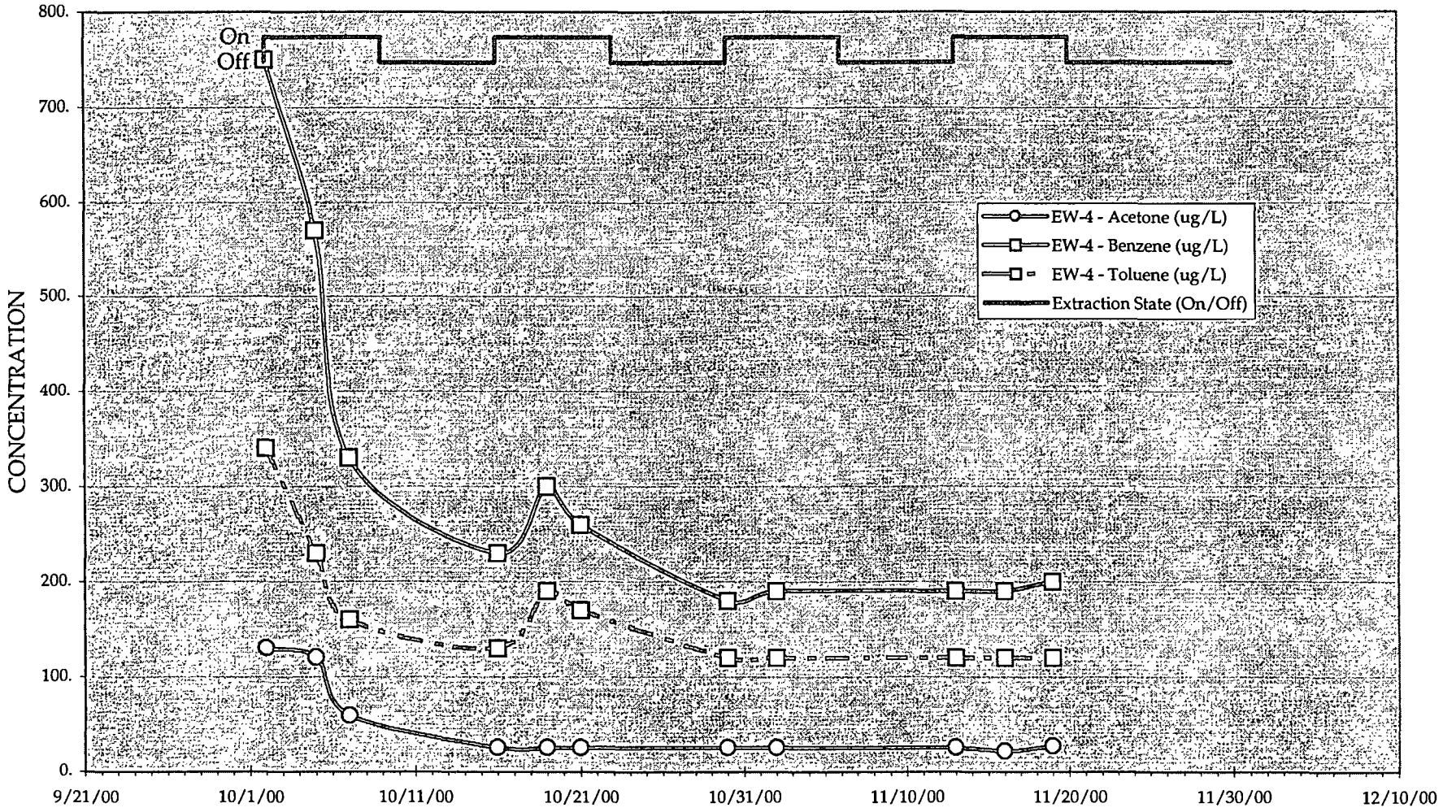
15670-AppM-Graph 1 xls EW4 GenChem
3/22/01 9 45 AM

GRAPH 2
EXTRACTION UNIT - EW-4 ANALYTICAL DATA
2,4-DIMETHYLPHENOL, 2-METHYLPHENOL, 4-METHYLPHENOL, PHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



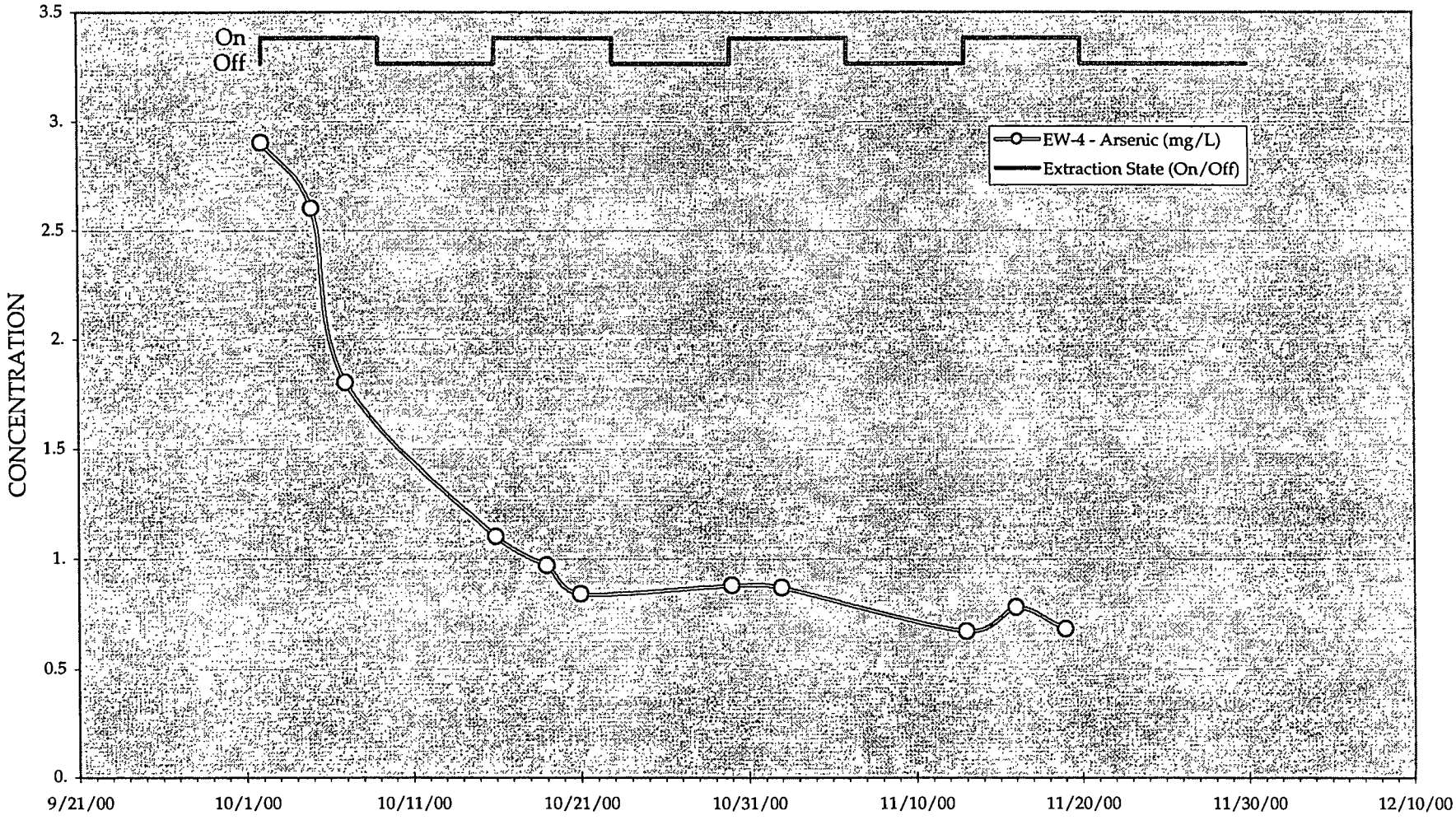
15670-AppM-Graph-2 xls EW4 SVOC
3/22/01 9:4[illegible]

GRAPH 3
EXTRACTION UNIT - EW-4 ANALYTICAL DATA
ACETONE, BENZENE, TOLUENE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



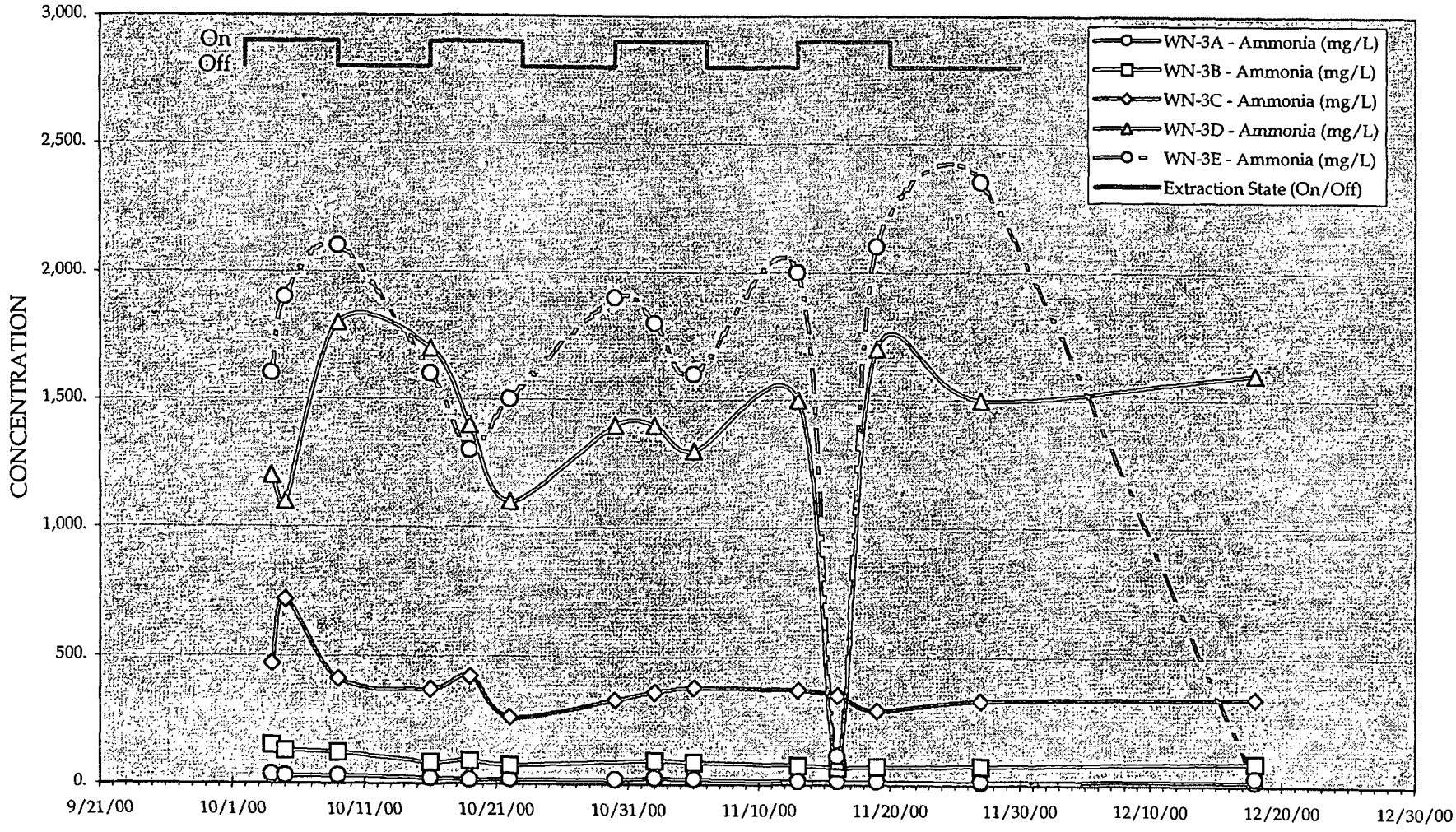
15670-AppM-Graph-3 xls EW4 VOC
3/22/01 9 47 AM

GRAPH 4
EXTRACTION UNIT - EW-4 ANALYTICAL DATA
ARSENIC
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



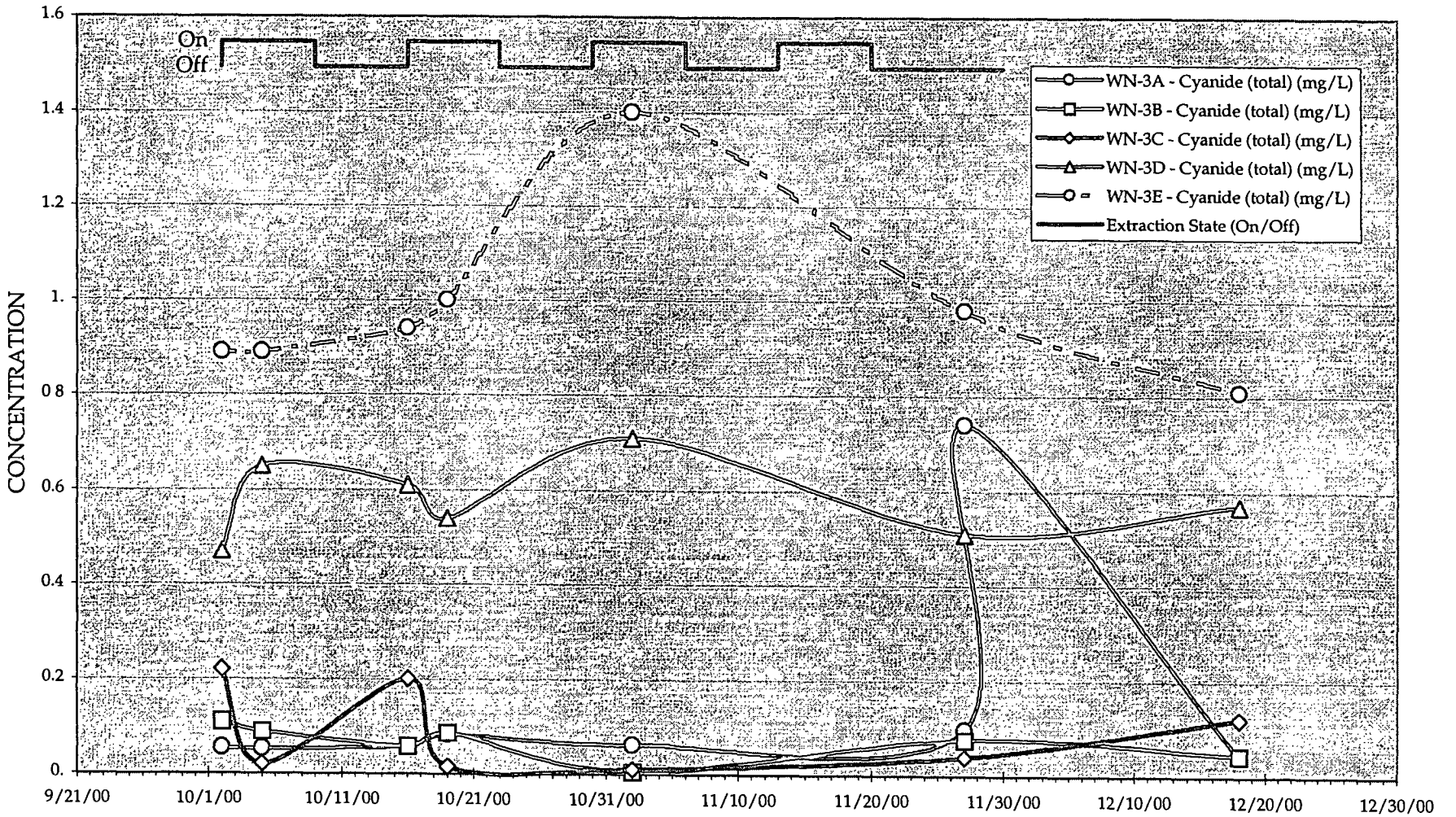
15670-AppM-Graph-4.xls EW4 Arsenic
3/22/01 9:42 AM

GRAPH 5
EXTRACTION UNIT - WN-3A, WN-3B, WN-3C, WN-3D, WN-3E ANALYTICAL DATA
AMMONIA
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

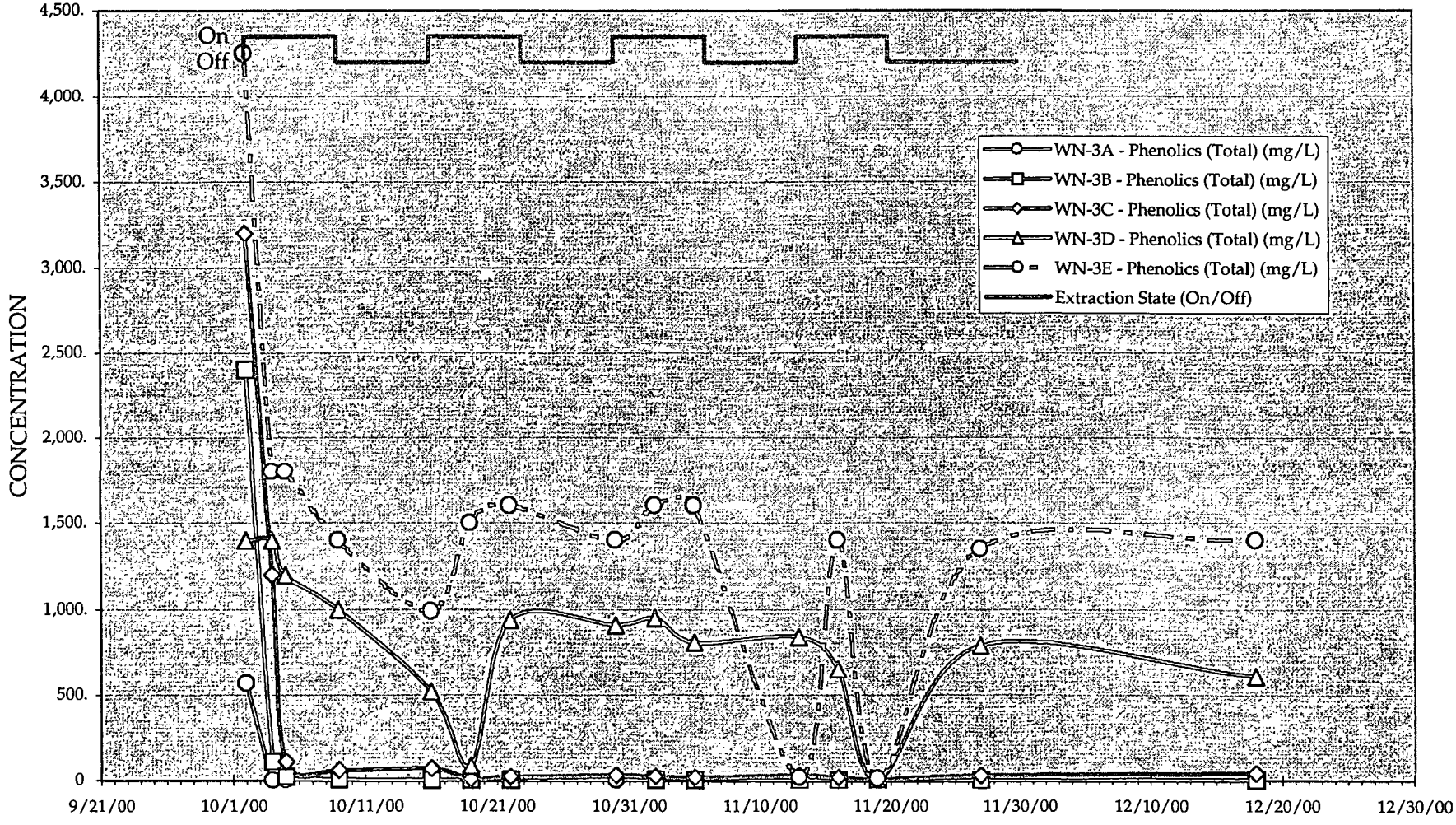


15670-AppM-Graph-5 xls WN3 Ammonia
3/22/01 9.48 AM

GRAPH 6
EXTRACTION UNIT - WN-3A, WN-3B, WN-3C, WN-3D, WN-3E ANALYTICAL DATA
CYANIDE (TOTAL)
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

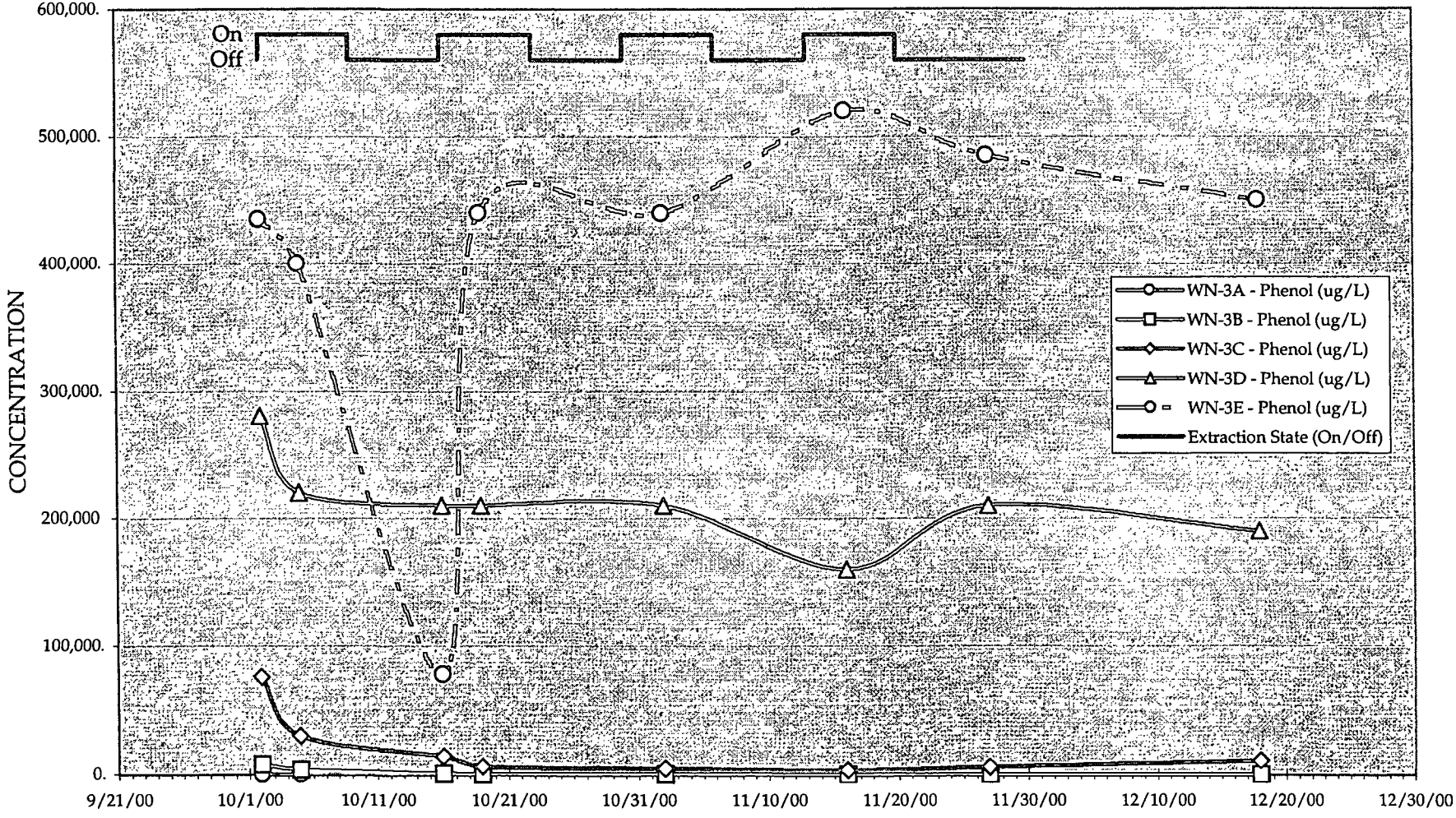


GRAPH 7
EXTRACTION UNIT - WN-3A, WN-3B, WN-3C, WN-3D, WN-3E ANALYTICAL DATA
PHENOLICS (TOTAL)
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



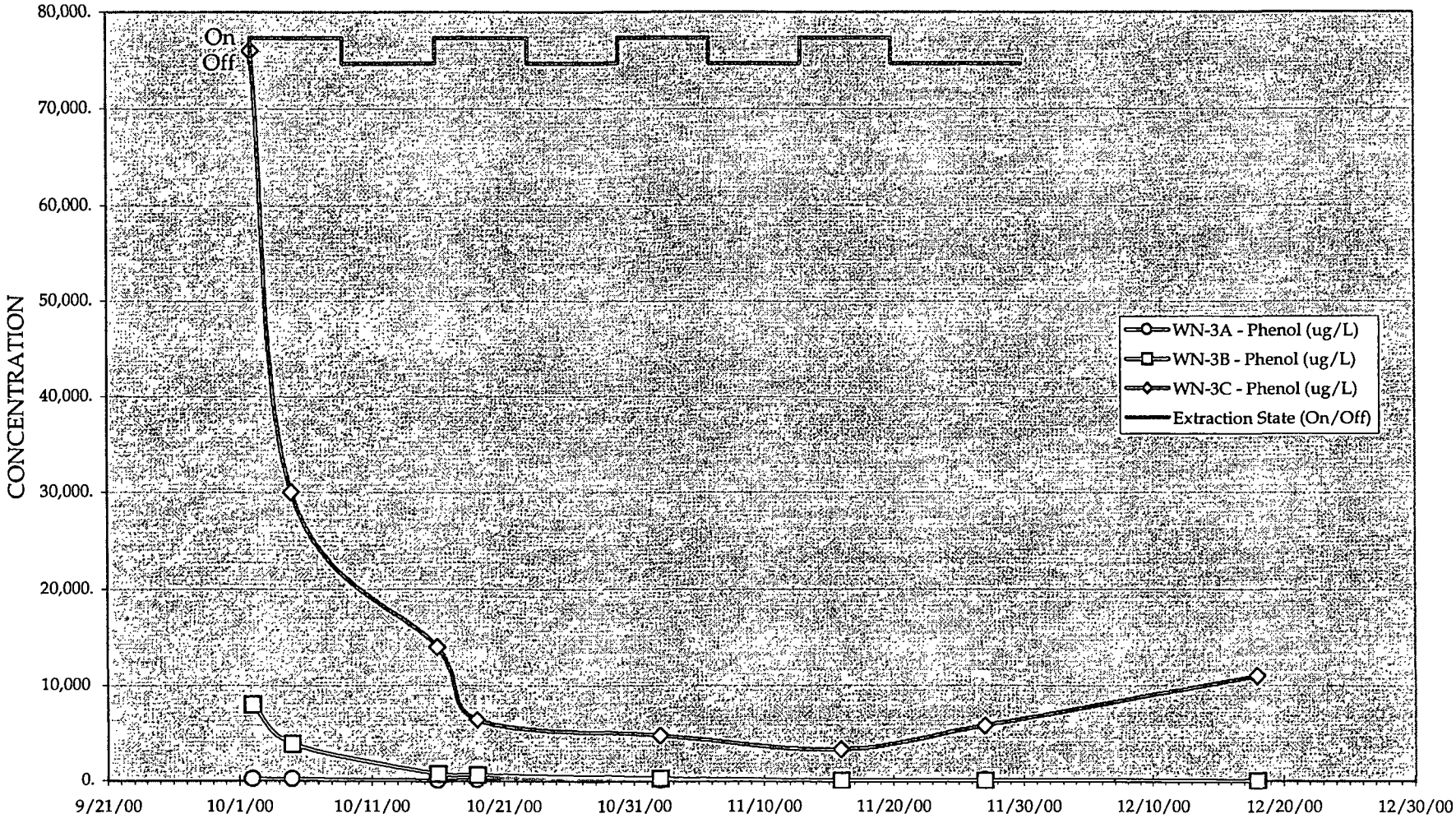
15670-AppM-Graph-7 xls WN3 Phenolics
3/22/01 9.49 AM

GRAPH 8
EXTRACTION UNIT - WN-3A, WN-3B, WN-3C, WN-3D, WN-3E ANALYTICAL DATA
PHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



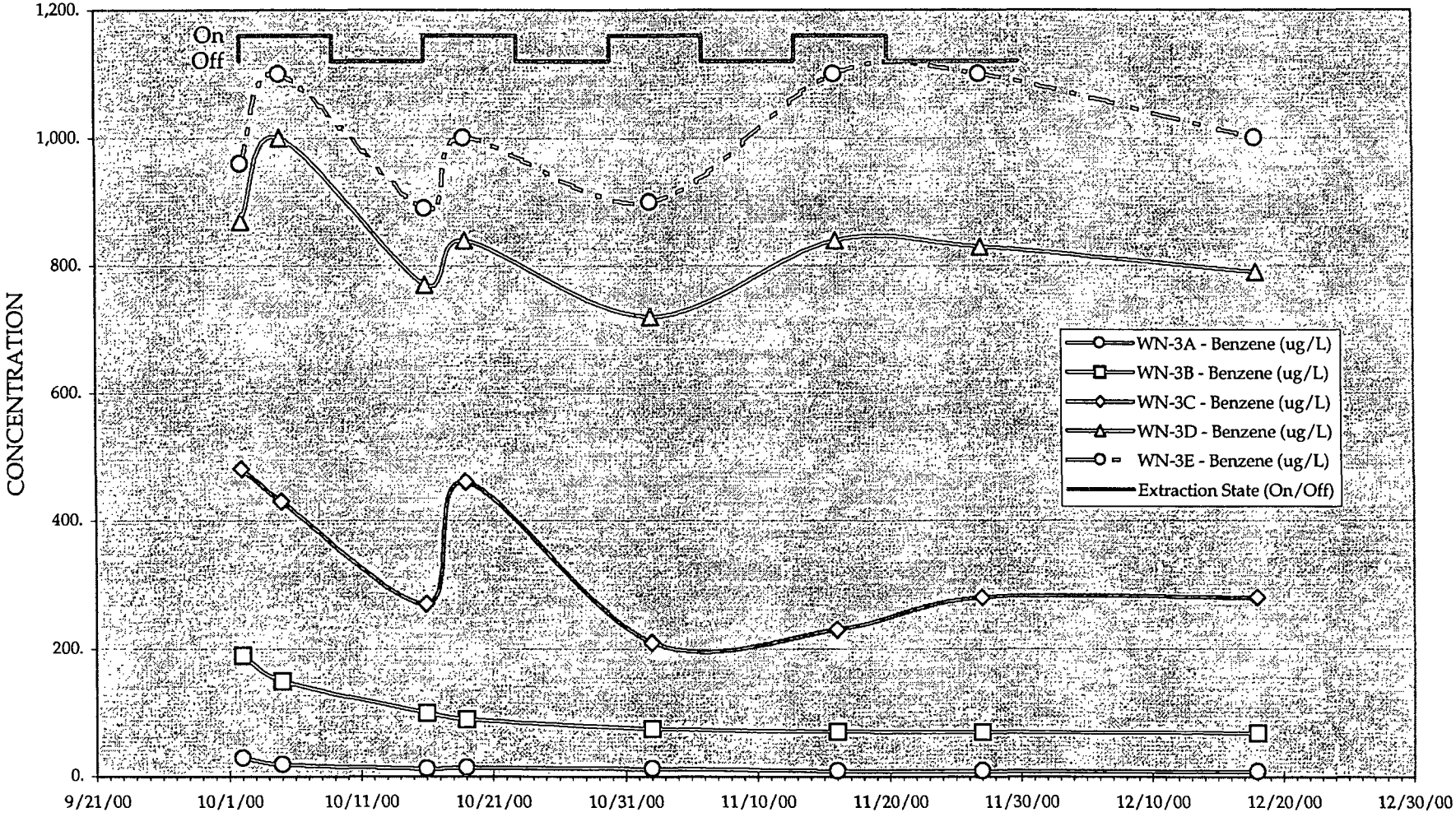
15670-AppM-Graph-8.xls WN3 Phenol
3/22/01 9

GRAPH 9
EXTRACTION UNIT - WN-3A, WN-3B, WN-3C, WN-3D, WN-3E ANALYTICAL DATA
PHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

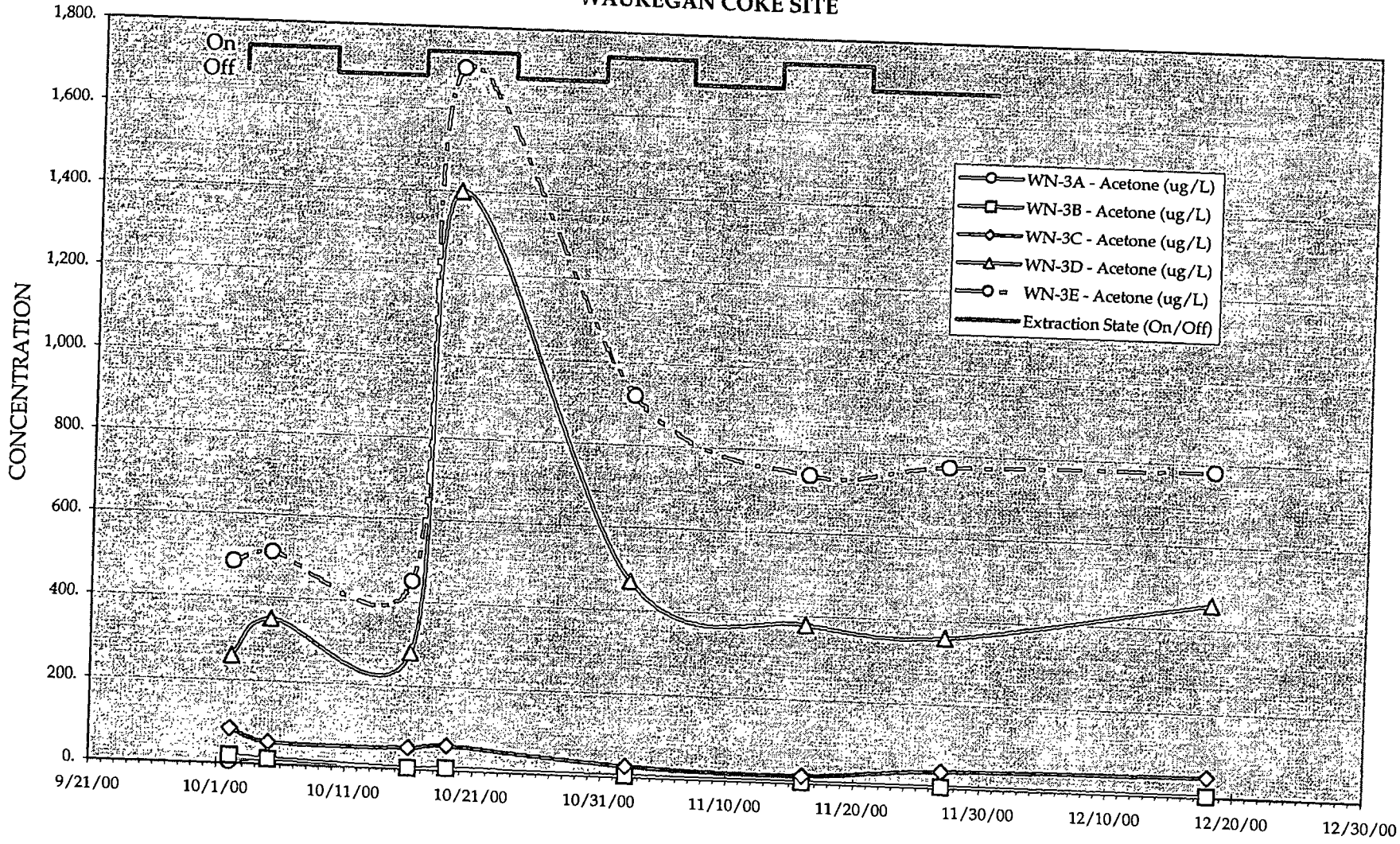


15670-AppM-Graph-9 xls WN3 Phenol
3/22/01 9 50 AM

GRAPH 10
EXTRACTION UNIT - WN-3A, WN-3B, WN-3C, WN-3D, WN-3E ANALYTICAL DATA
BENZENE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

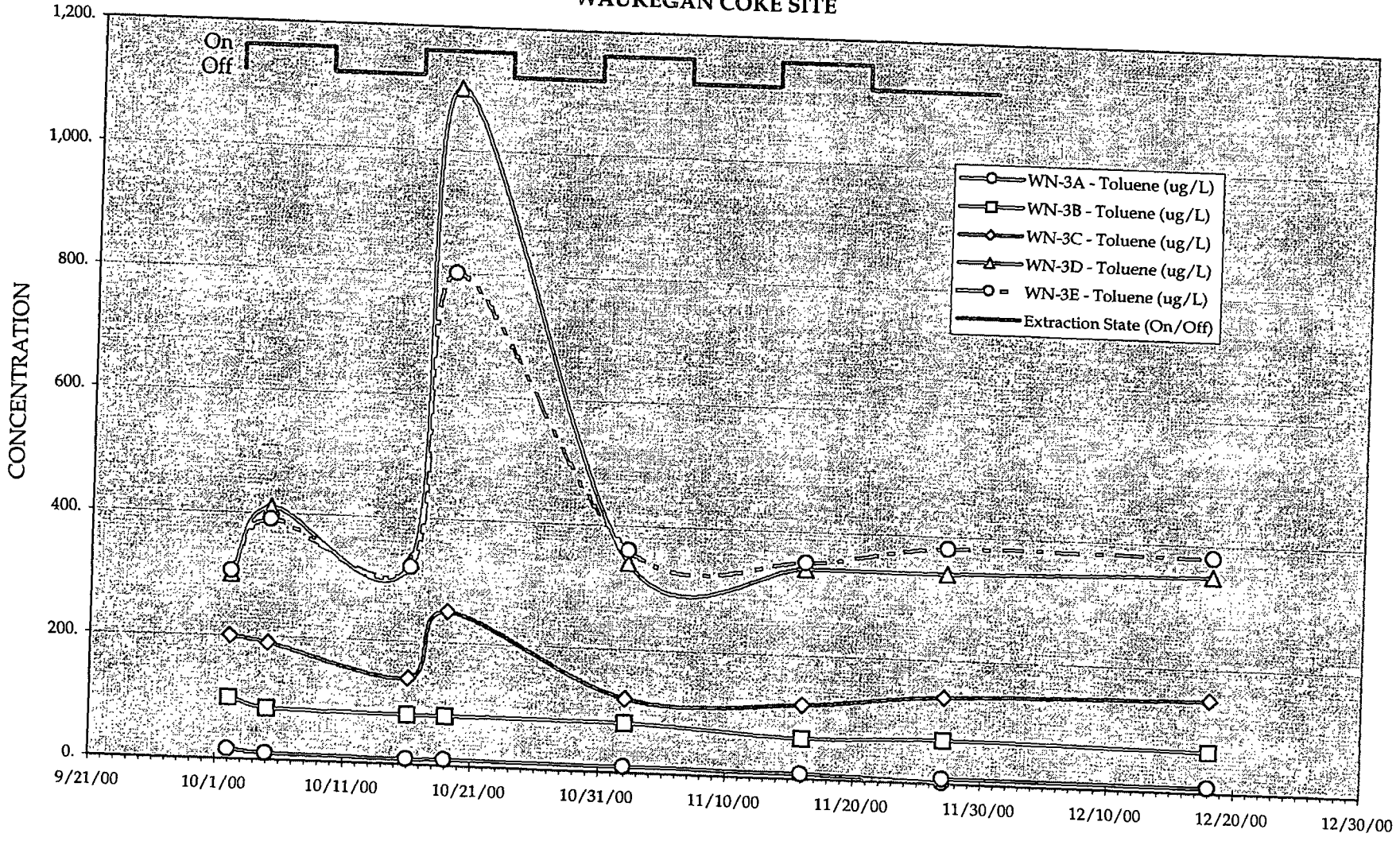


GRAPH 11
EXTRACTION UNIT - WN-3A, WN-3B, WN-3C, WN-3D, WN-3E ANALYTICAL DATA
ACETONE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



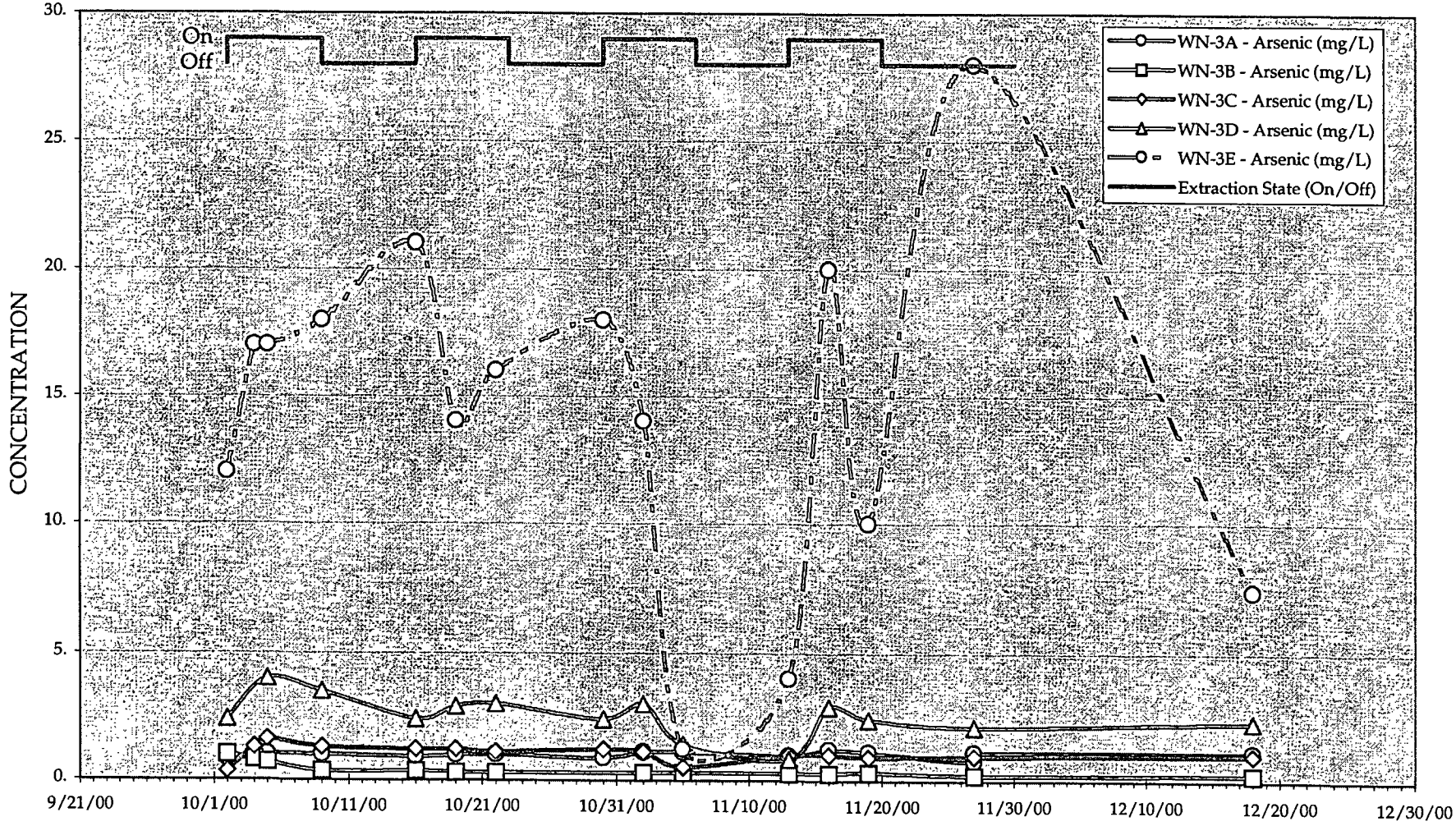
15670-AppM-Graphs-10-11-12.xls WN3 Acetone
3/22/01 9 50 AM

GRAPH 12
EXTRACTION UNIT - WN-3A, WN-3B, WN-3C, WN-3D, WN-3E ANALYTICAL DATA
TOLUENE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



15670-AppM-Graphs-10-11-12.xls WN3 Toluene
3/22/01 9 51 AM

GRAPH 13
EXTRACTION UNIT - WN-3A, WN-3B, WN-3C, WN-3D, WN-3E ANALYTICAL DATA
ARSENIC
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

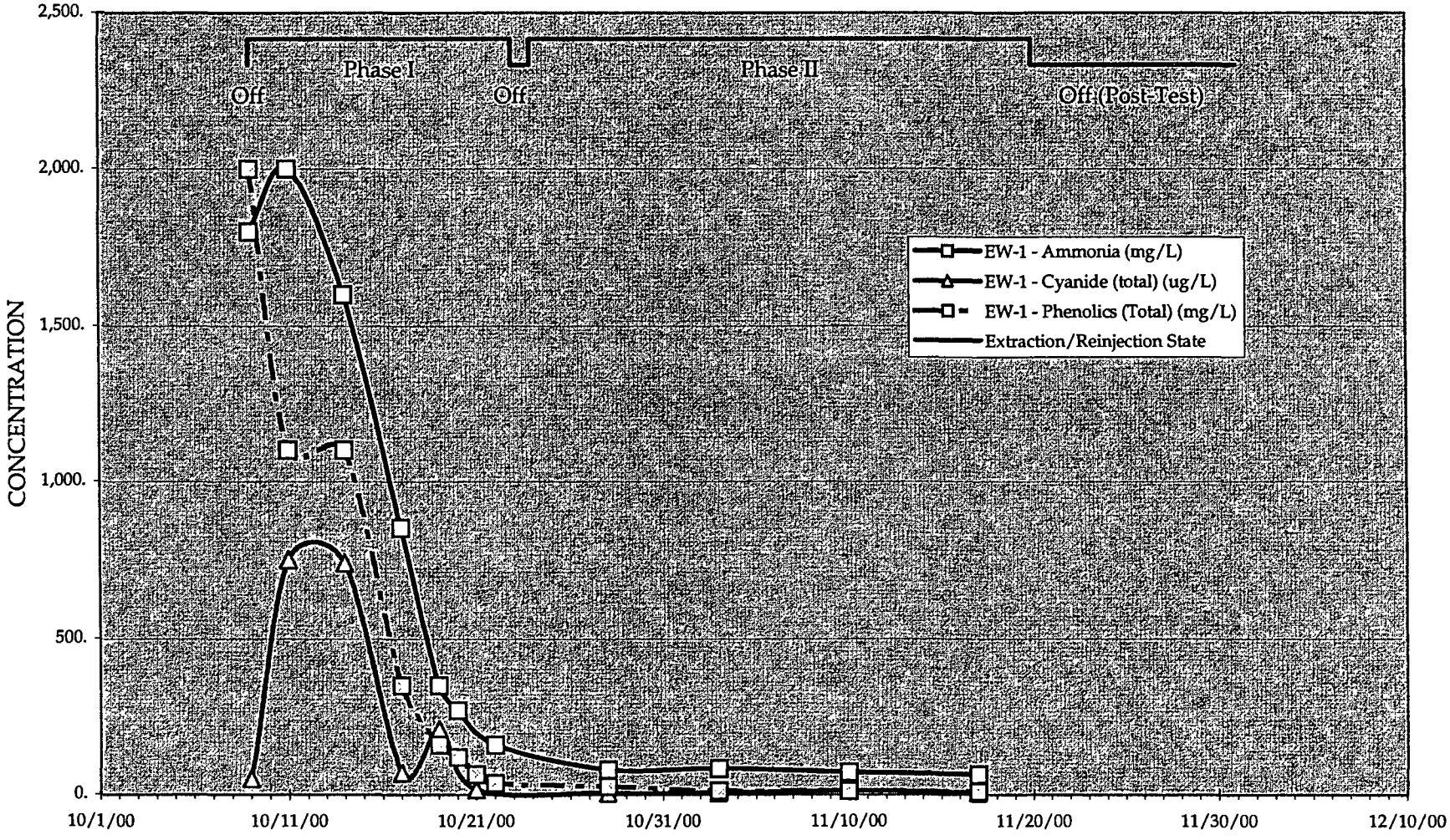


15670-App-M-Graph 13 xls WN3 Arsenic
3/22/01 9 46 AM

APPENDIX N

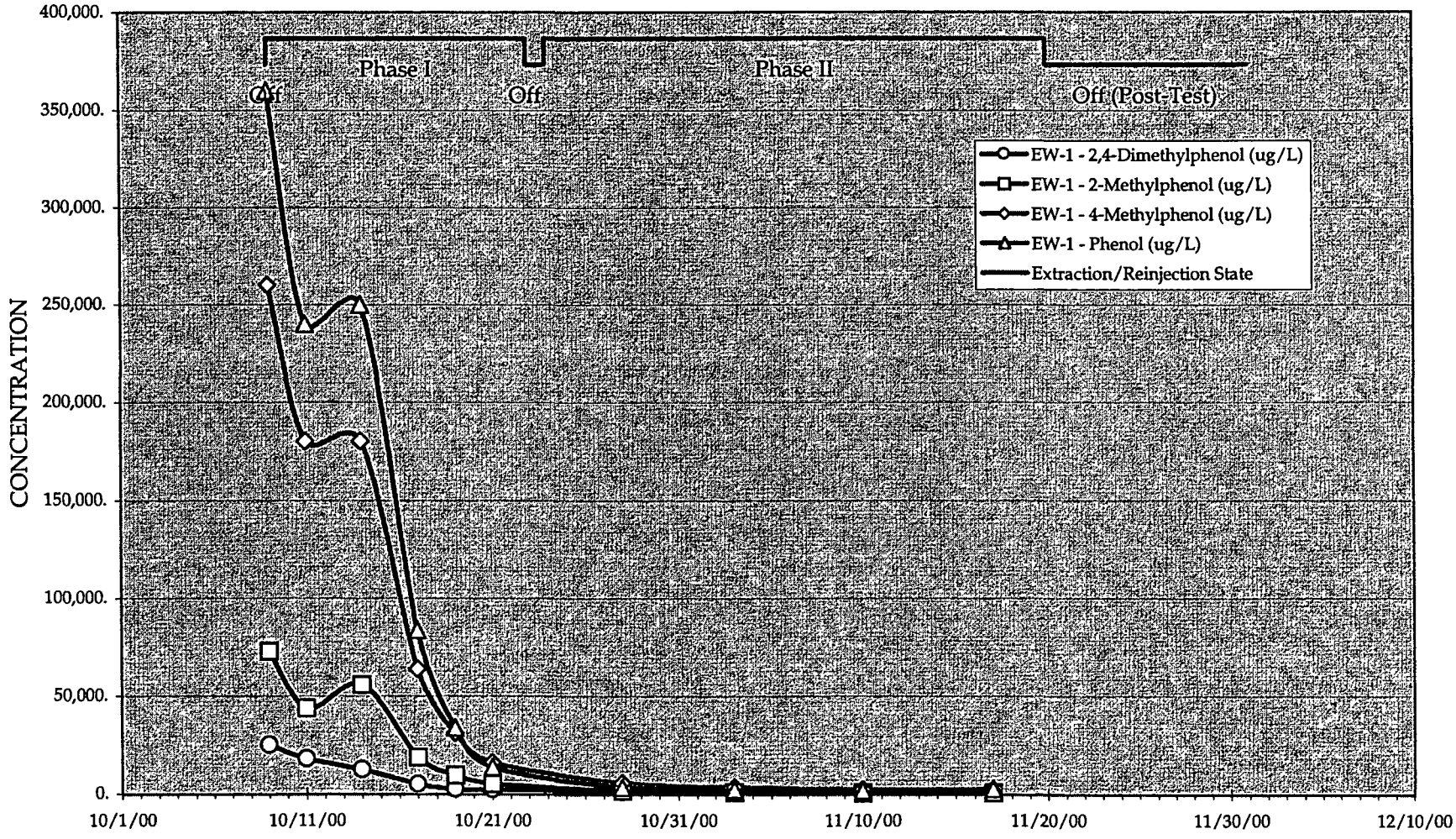
E/R UNIT GRAPHS

GRAPH 1
EXTRACTION/REINJECTION UNIT - EW-1 ANALYTICAL DATA
AMMONIA, CYANIDE (TOTAL), PHENOLICS (TOTAL), THIOCYANATE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

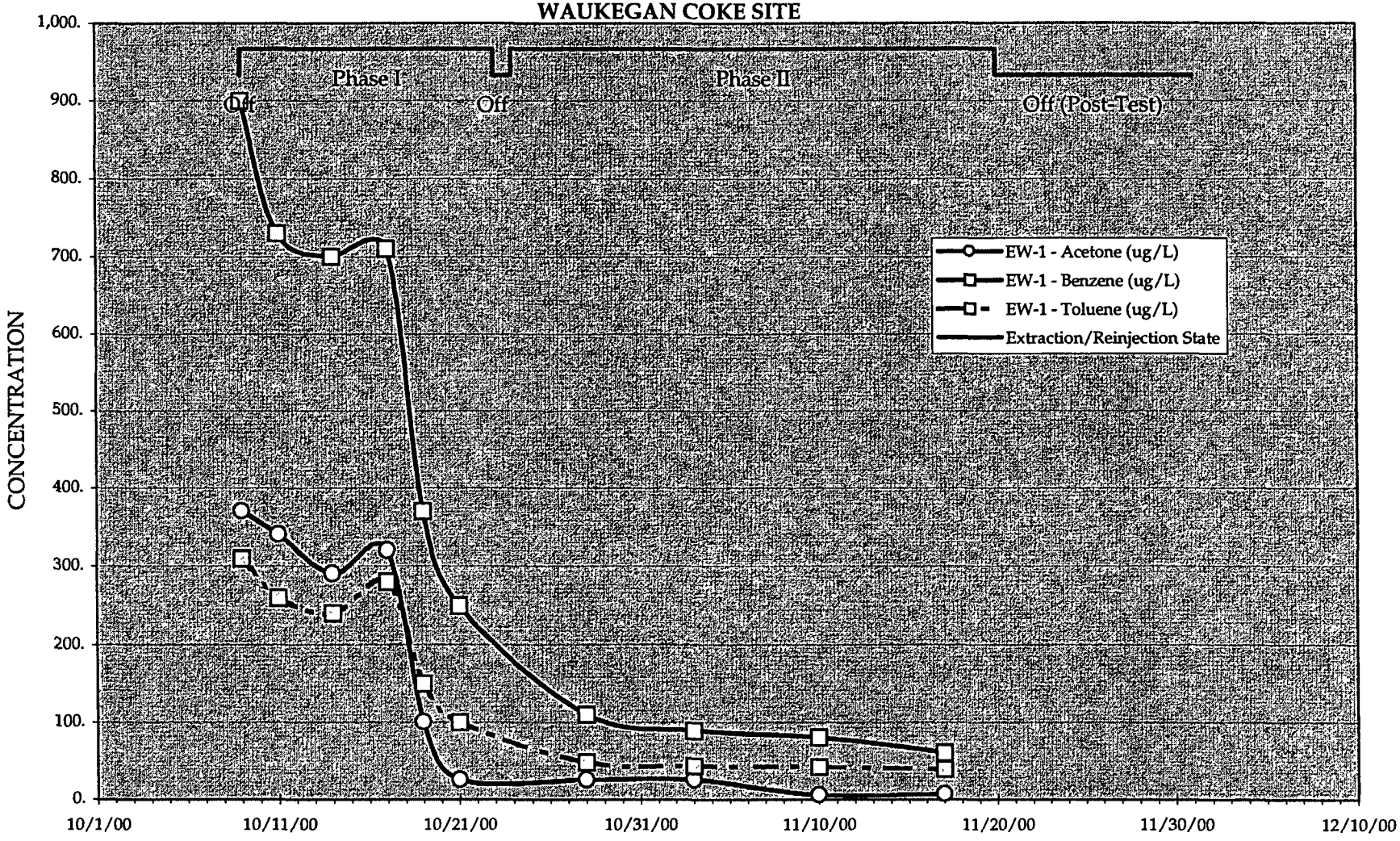


15670-App-N-Graph1.xls: EW1 GenChem
3/22/01 9.28 AM

GRAPH 2
EXTRACTION/REINJECTION UNIT - EW-1 ANALYTICAL DATA
2,4-DIMETHYLPHENOL, 2-METHYLPHENOL, 4-METHYLPHENOL, PHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

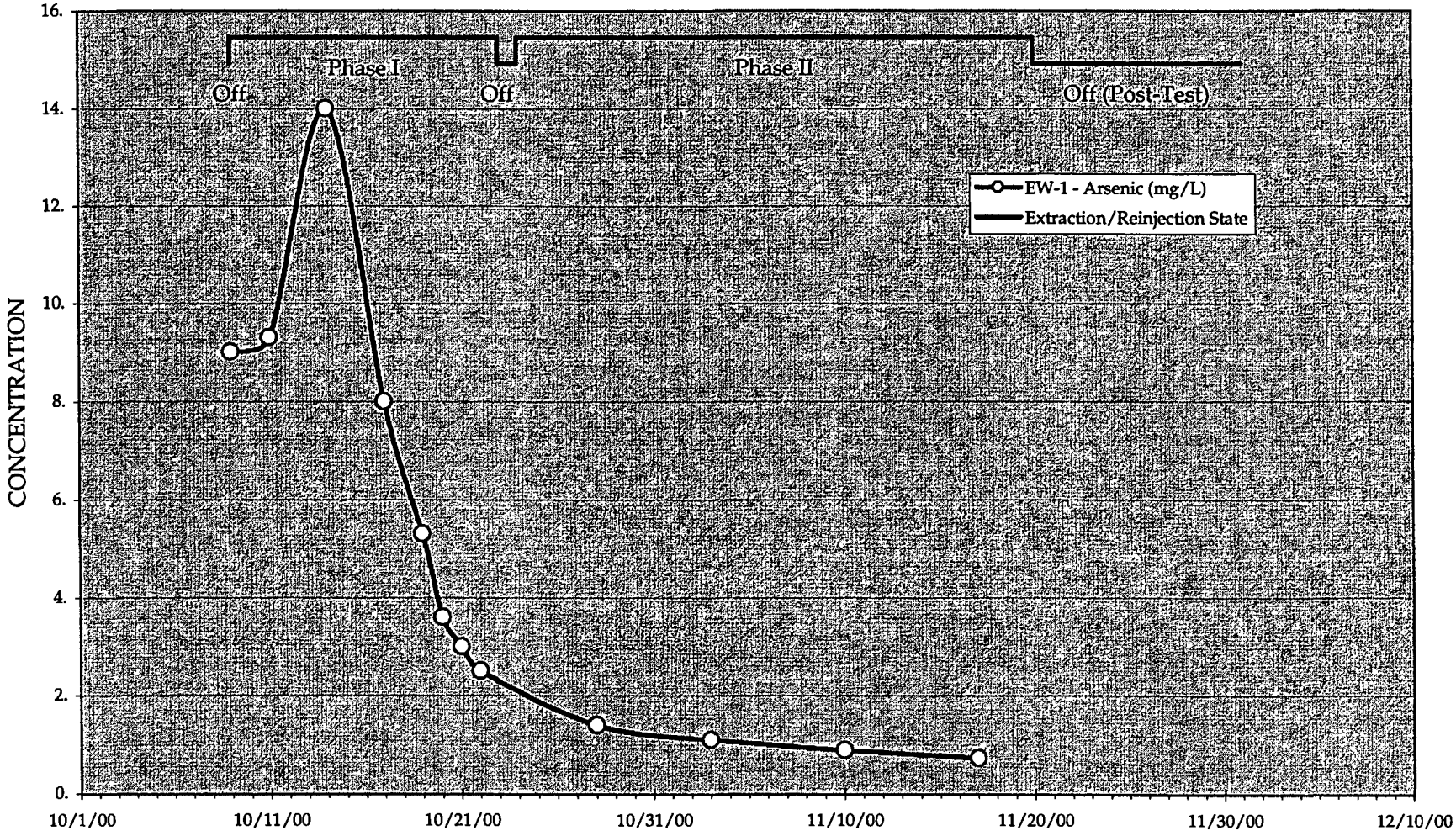


GRAPH 3
EXTRACTION/REINJECTION UNIT - EW-1 ANALYTICAL DATA
ACETONE, BENZENE, 2-BUTANONE, ETHYLBENZENE, STYRENE, TOLUENE, CHLOROFORM, XYLENE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



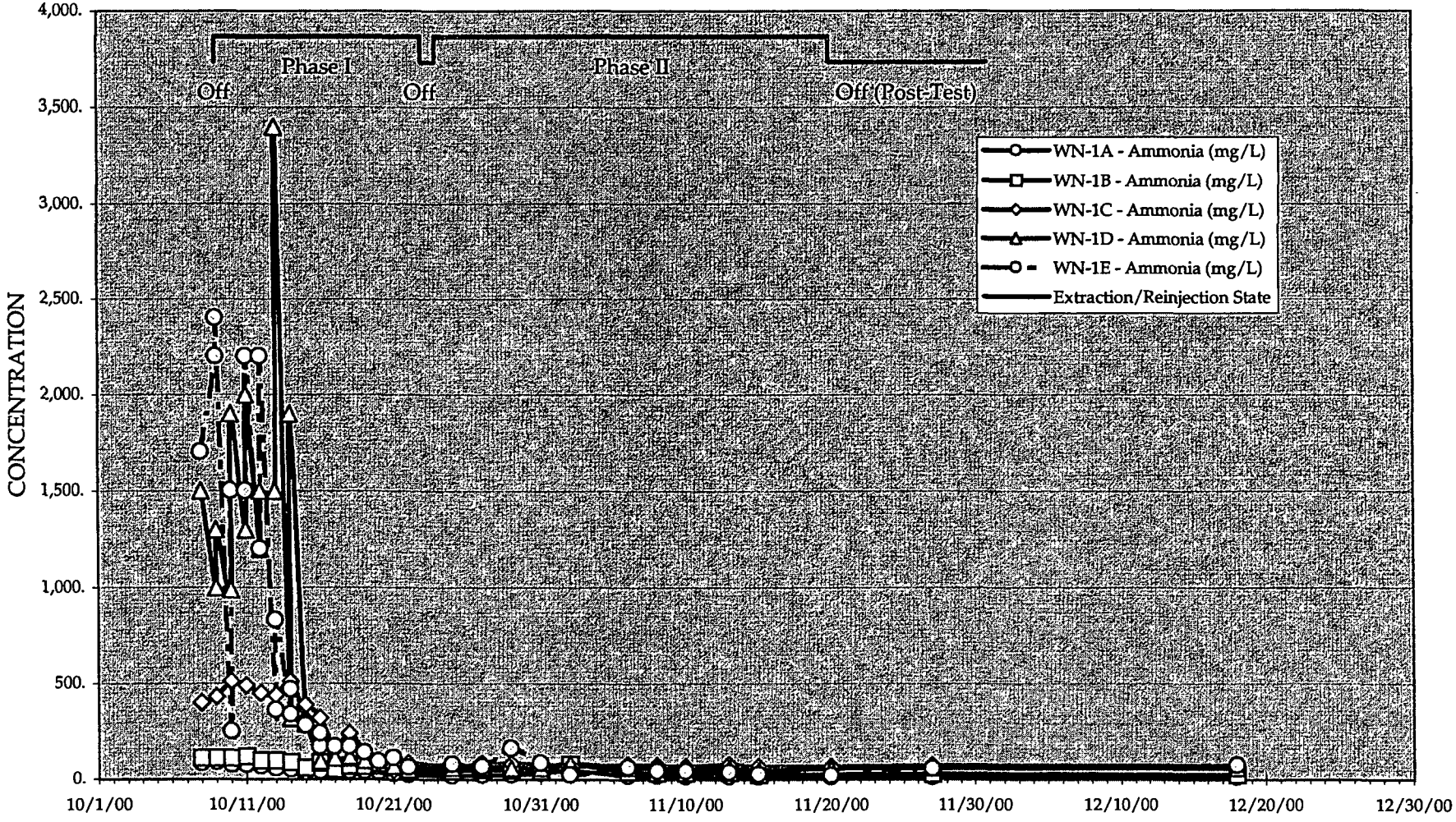
15670-App-N-Graph3 xls. EW1 VOC
3/22/01 9 29 AM

GRAPH 4
EXTRACTION/REINJECTION UNIT - EW-1 ANALYTICAL DATA
ARSENIC
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



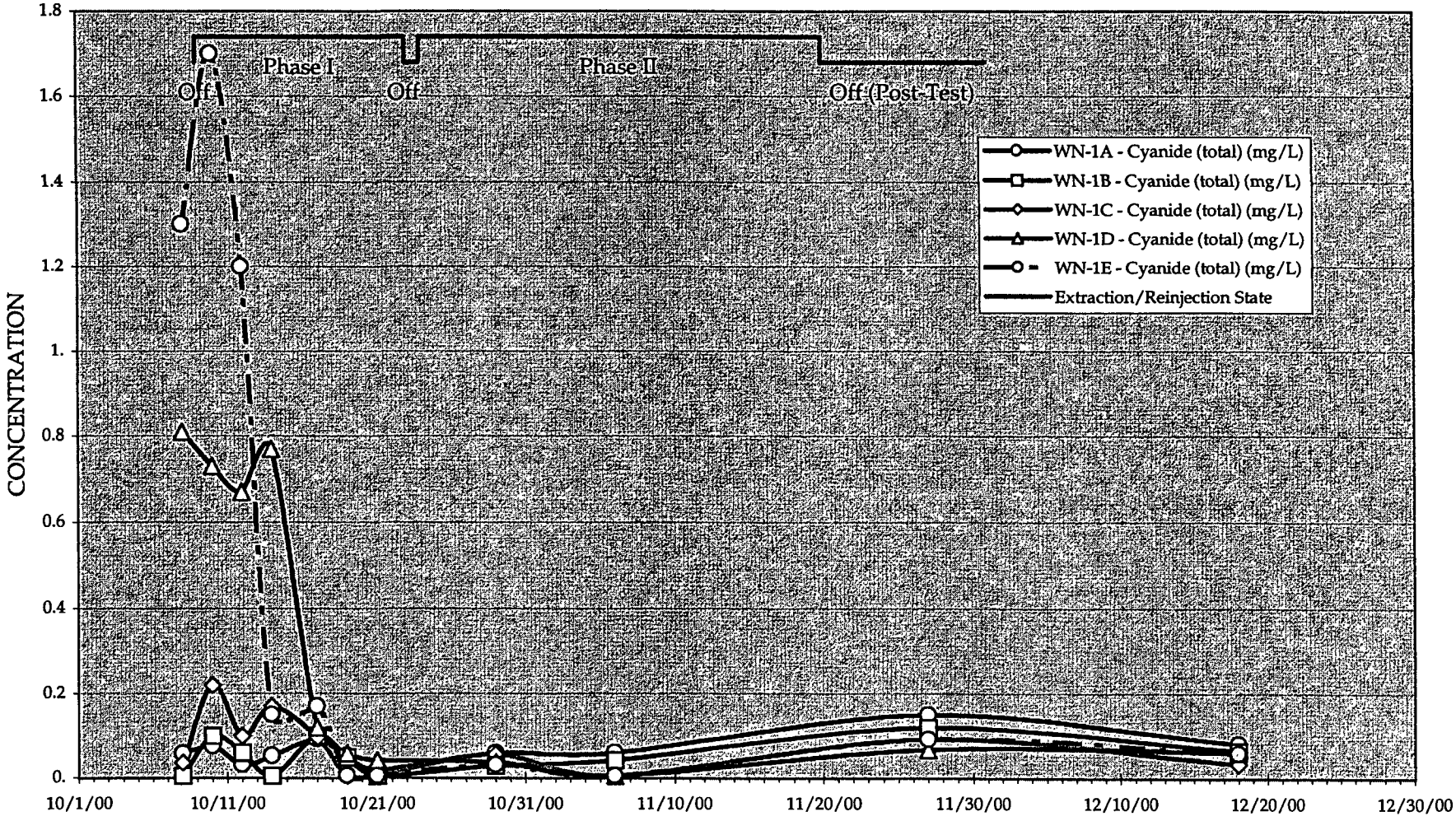
15670-App-N-Graph4.xls: EW1 Arsenic
3/22/01 9 28 AM

GRAPH 5
EXTRACTION/REINJECTION UNIT - WN-1A, WN-1B, WN-1C, WN-1D, WN-1E ANALYTICAL DATA
AMMONIA
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

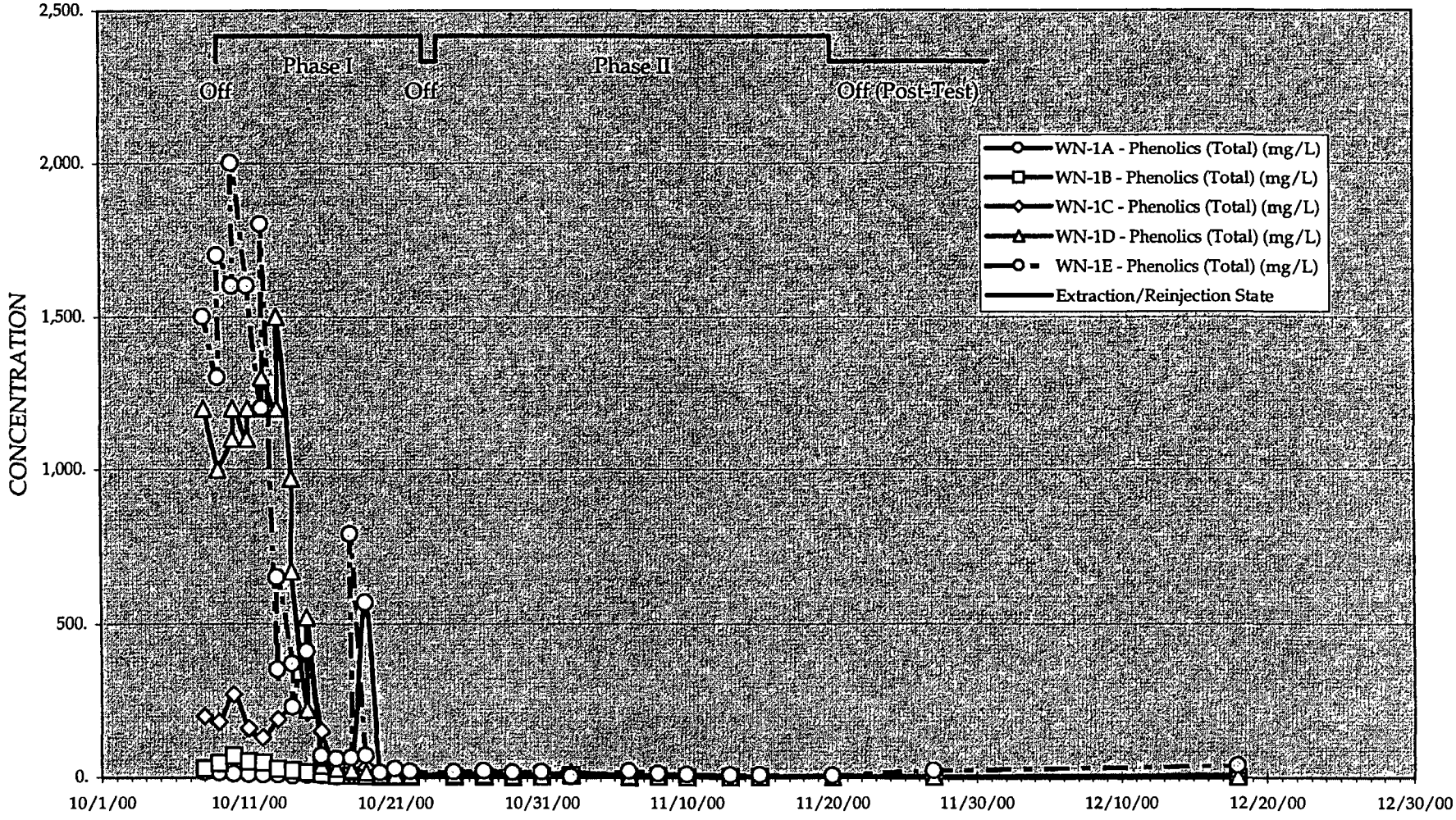


15670-App-N-Graphs5-6-7.xls. WN1 Ammonia
3/22/01 9 33 AM

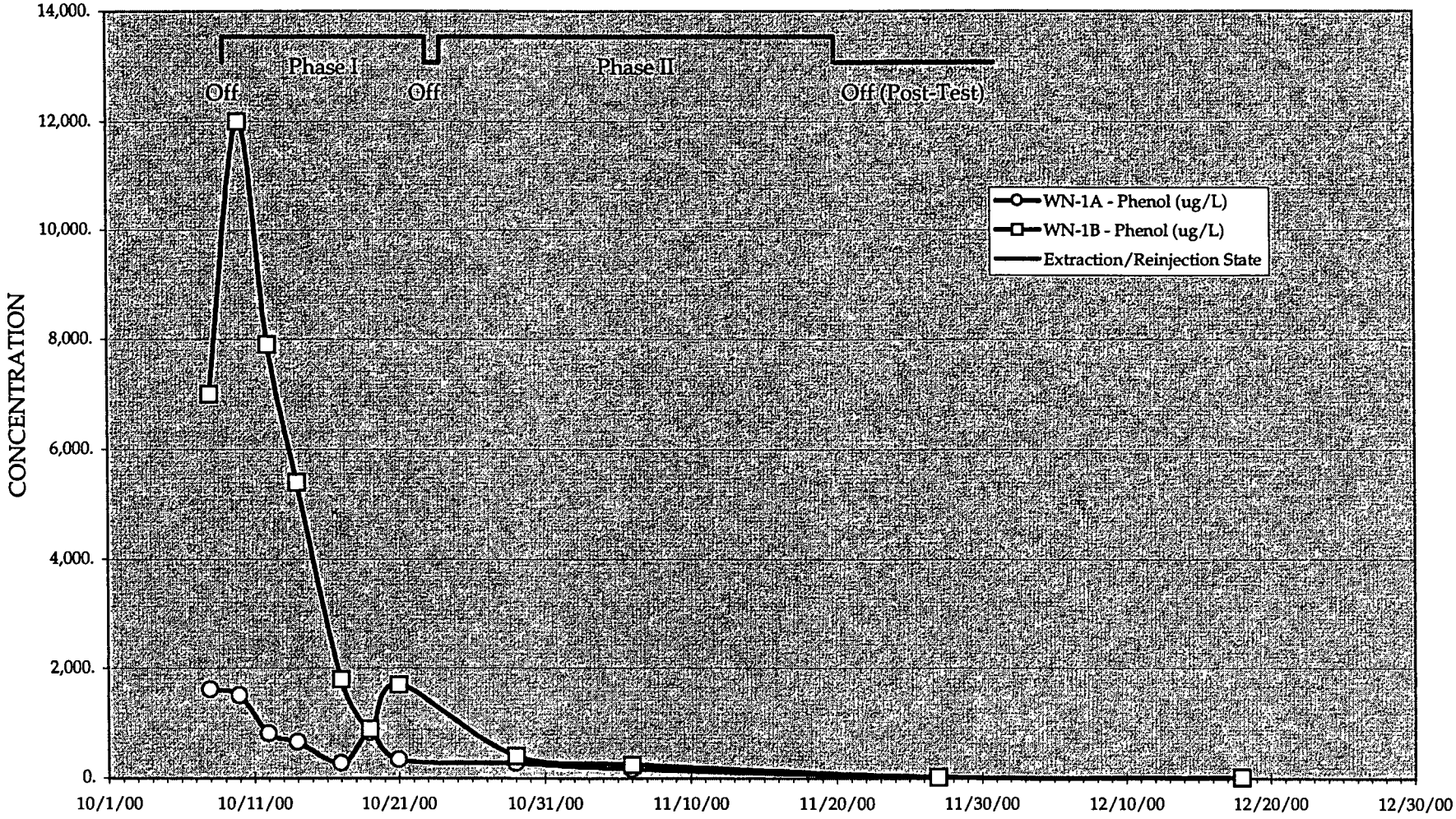
GRAPH 6
EXTRACTION/REINJECTION UNIT - WN-1A, WN-1B, WN-1C, WN-1D, WN-1E ANALYTICAL DATA
CYANIDE (TOTAL)
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



GRAPH 7
EXTRACTION/REINJECTION UNIT - WN-1A, WN-1B, WN-1C, WN-1D, WN-1E ANALYTICAL DATA
PHENOLICS (TOTAL)
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

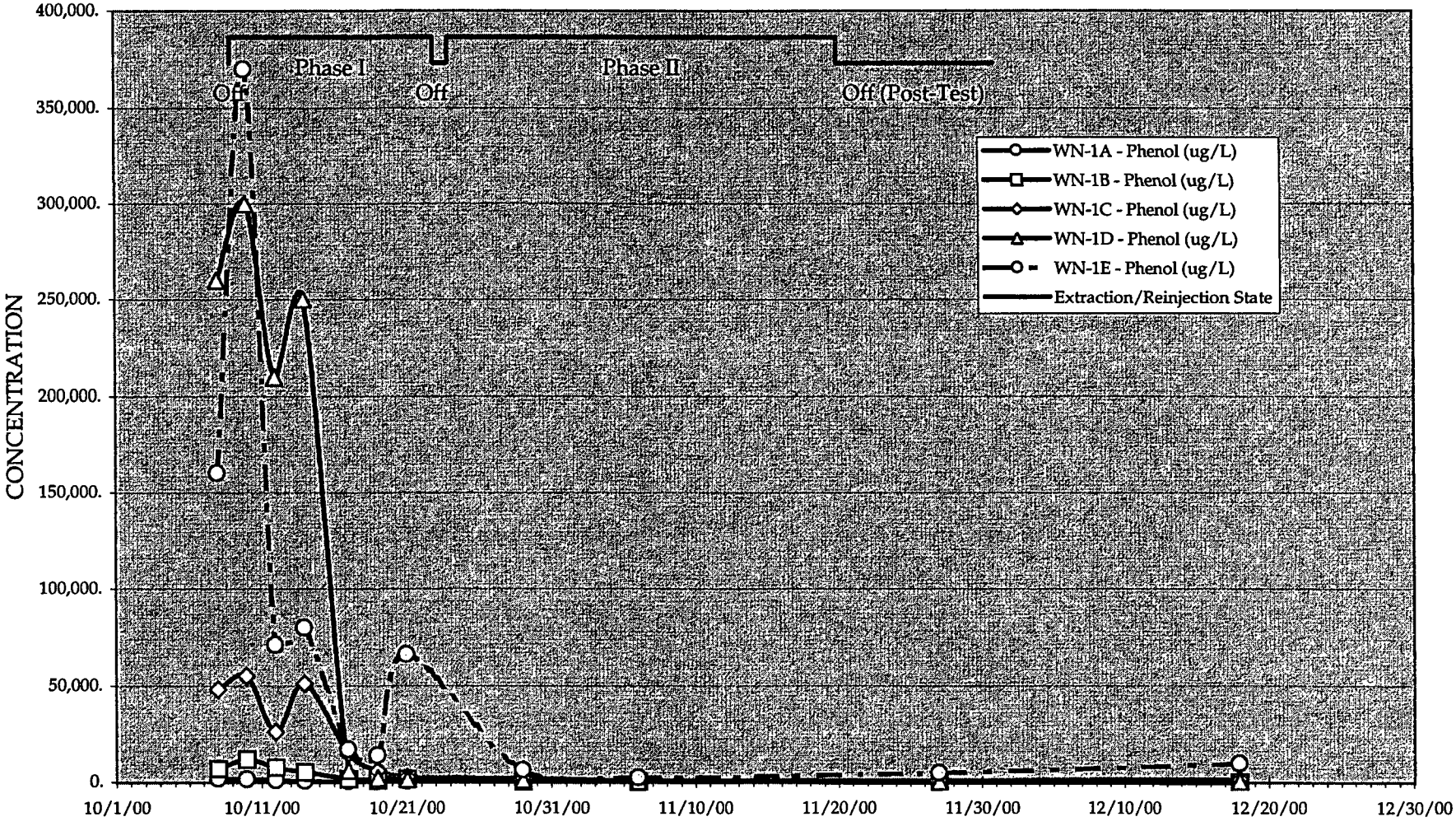


GRAPH 8
EXTRACTION/REINJECTION UNIT - WN-1A, WN-1B ANALYTICAL DATA
PHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



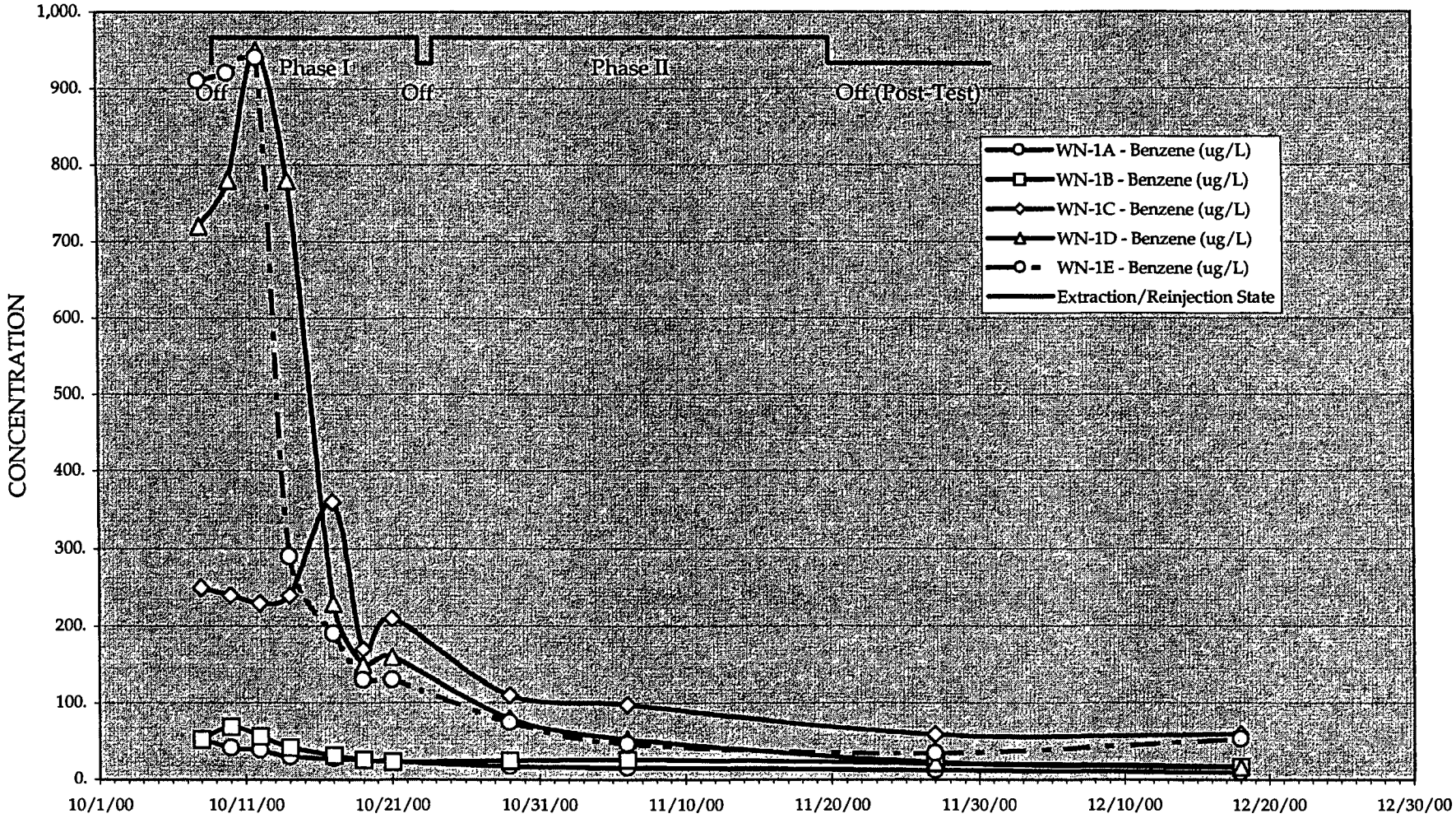
15670-App-N-Graph8 xls: WN1 Phenol
3/22/01 9.28 AM

GRAPH 9
EXTRACTION/REINJECTION UNIT - WN-1A, WN-1B, WN-1C, WN-1D, WN-1E ANALYTICAL DATA
PHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

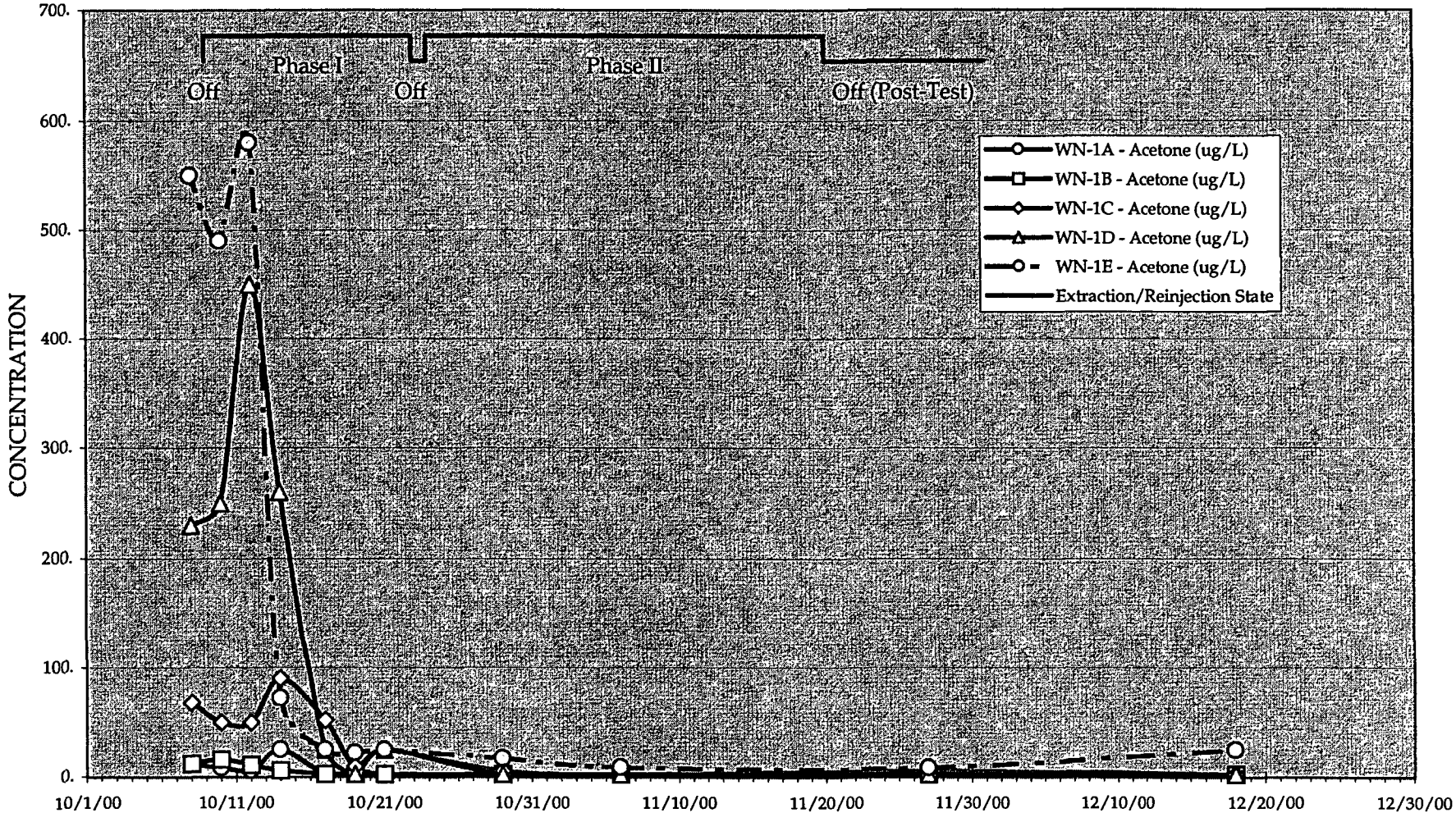


15670-App-N-Graph9.xls WN1 Phenol
3/22/01 9.36 AM

GRAPH 10
EXTRACTION/REINJECTION UNIT - WN-1A, WN-1B, WN-1C, WN-1D, WN-1E ANALYTICAL DATA
BENZENE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

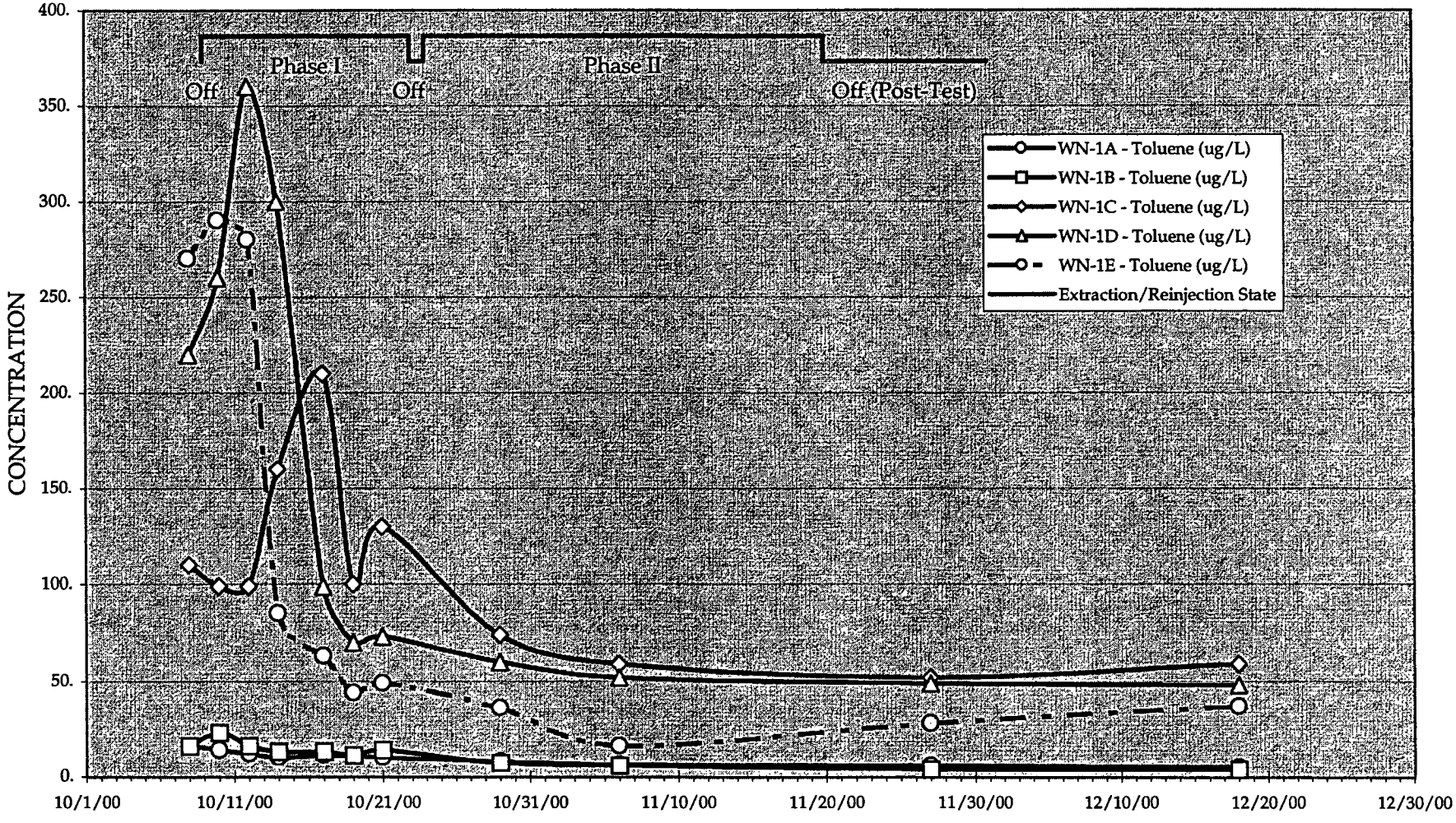


GRAPH 11
EXTRACTION/REINJECTION UNIT - WN-1A, WN-1B, WN-1C, WN-1D, WN-1E ANALYTICAL DATA
ACETONE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

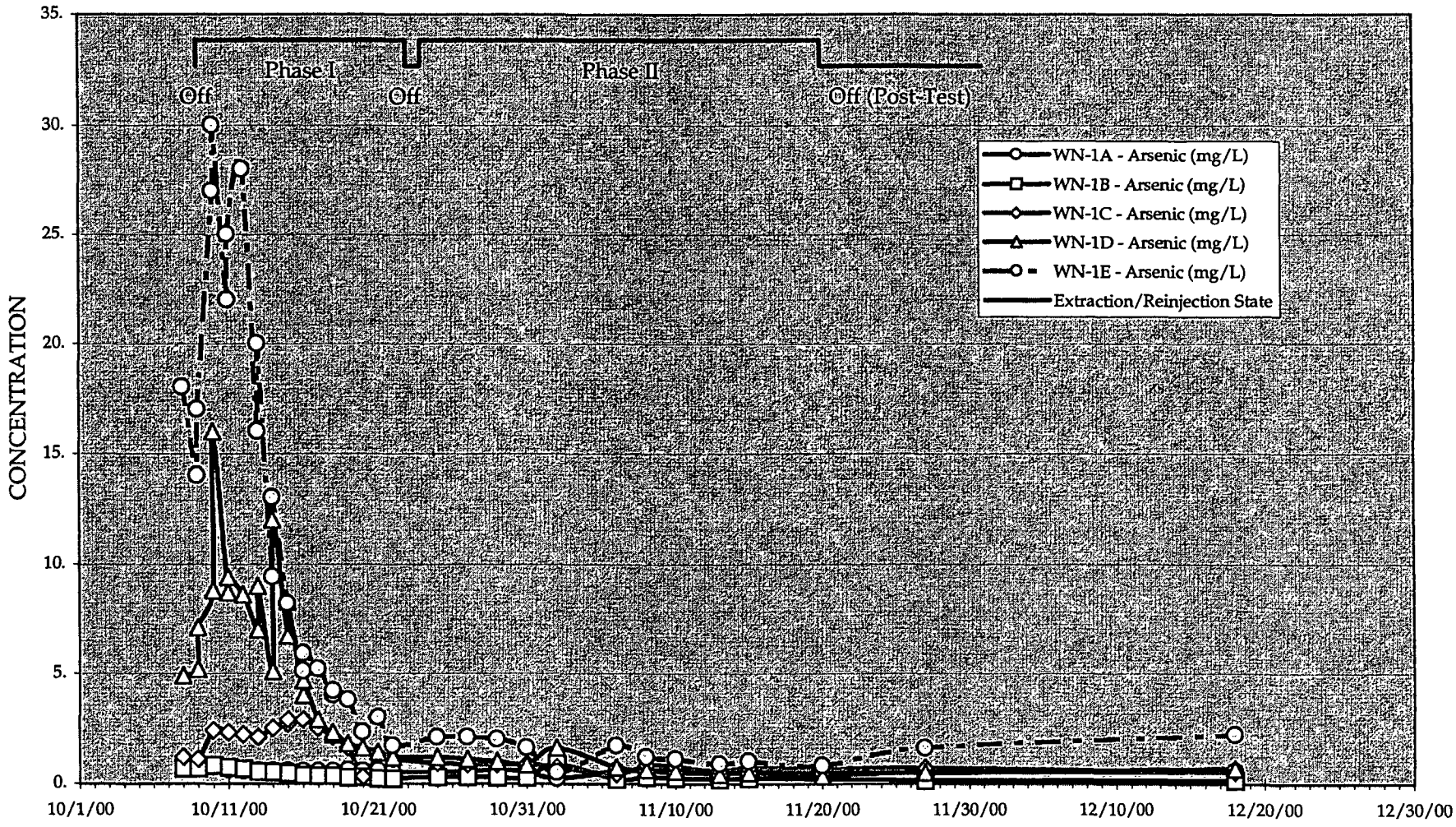


15670-App-N-Graphs10-11-12.xls: WN1 Acetone
3/22/01 9.28 AM

GRAPH 12
EXTRACTION/REINJECTION UNIT - WN-1A, WN-1B, WN-1C, WN-1D, WN-1E ANALYTICAL DATA
TOLUENE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

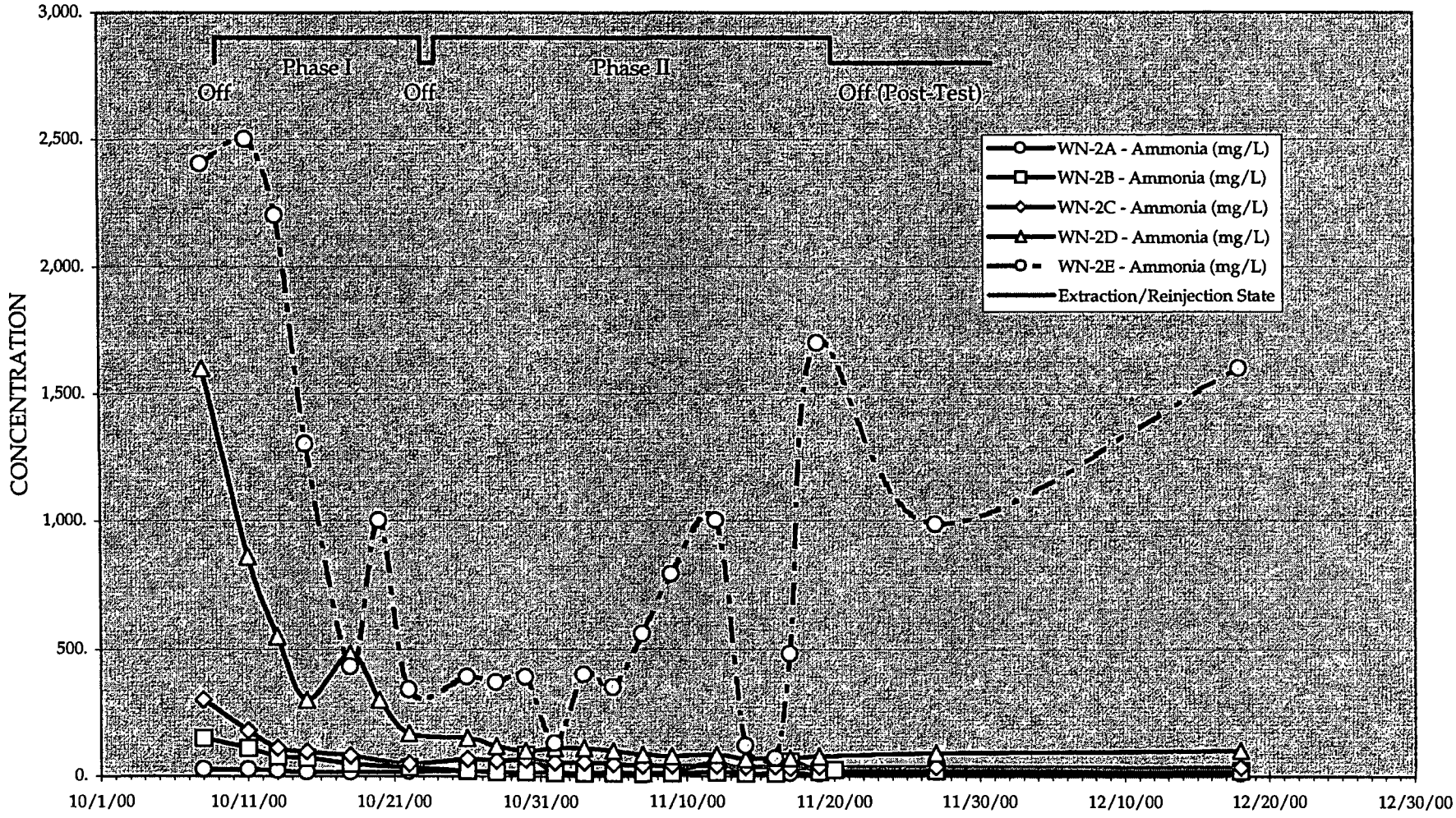


GRAPH 13
EXTRACTION/REINJECTION UNIT - WN-1A, WN-1B, WN-1C, WN-1D, WN-1E ANALYTICAL DATA
ARSENIC
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



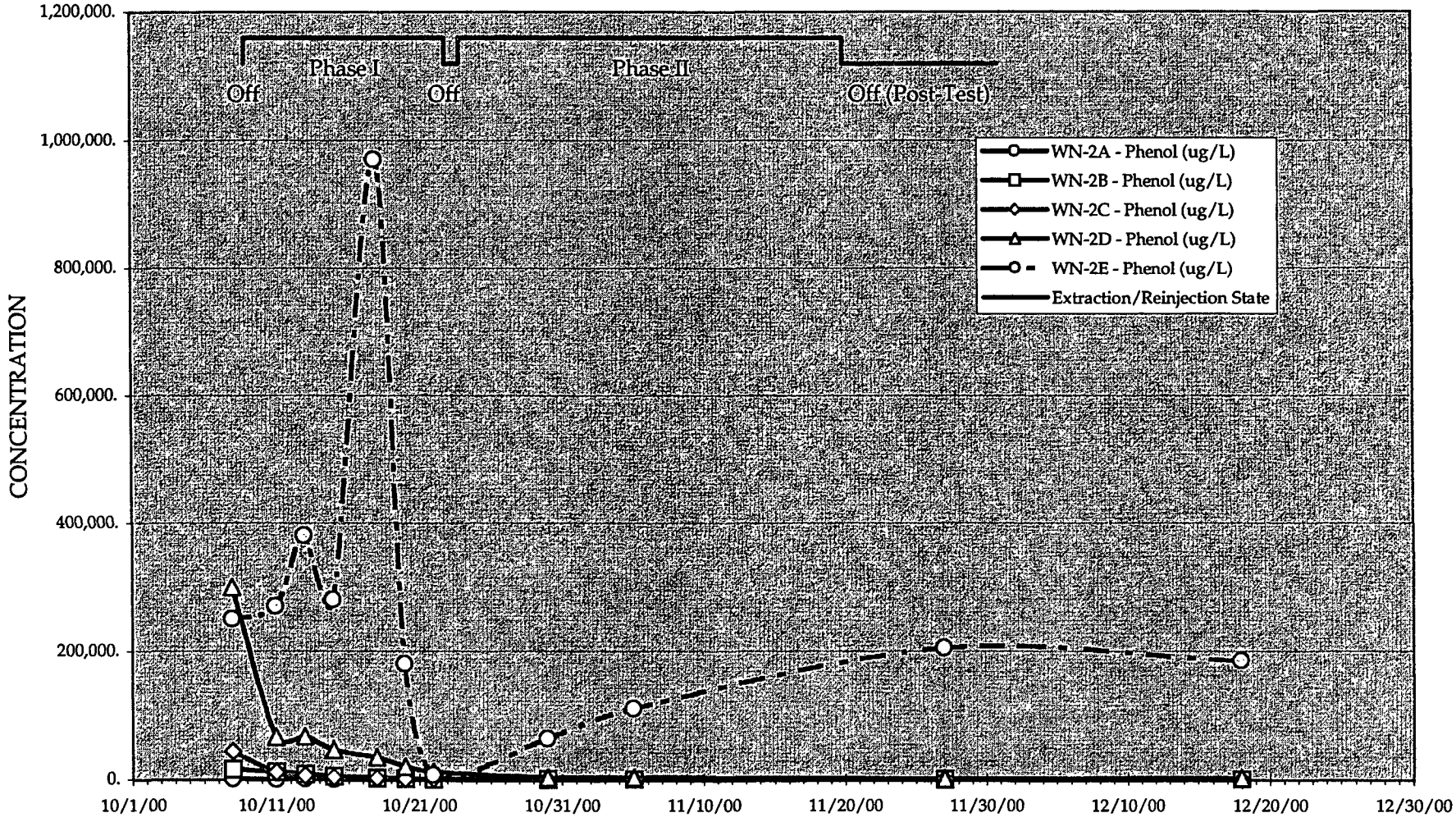
15670-App-N-Graph13 xls: WN1 As
3/22/01 9 34 AM

GRAPH 14
EXTRACTION/REINJECTION UNIT - WN-2A, WN-2B, WN-2C, WN-2D, WN-2E ANALYTICAL DATA
AMMONIA
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

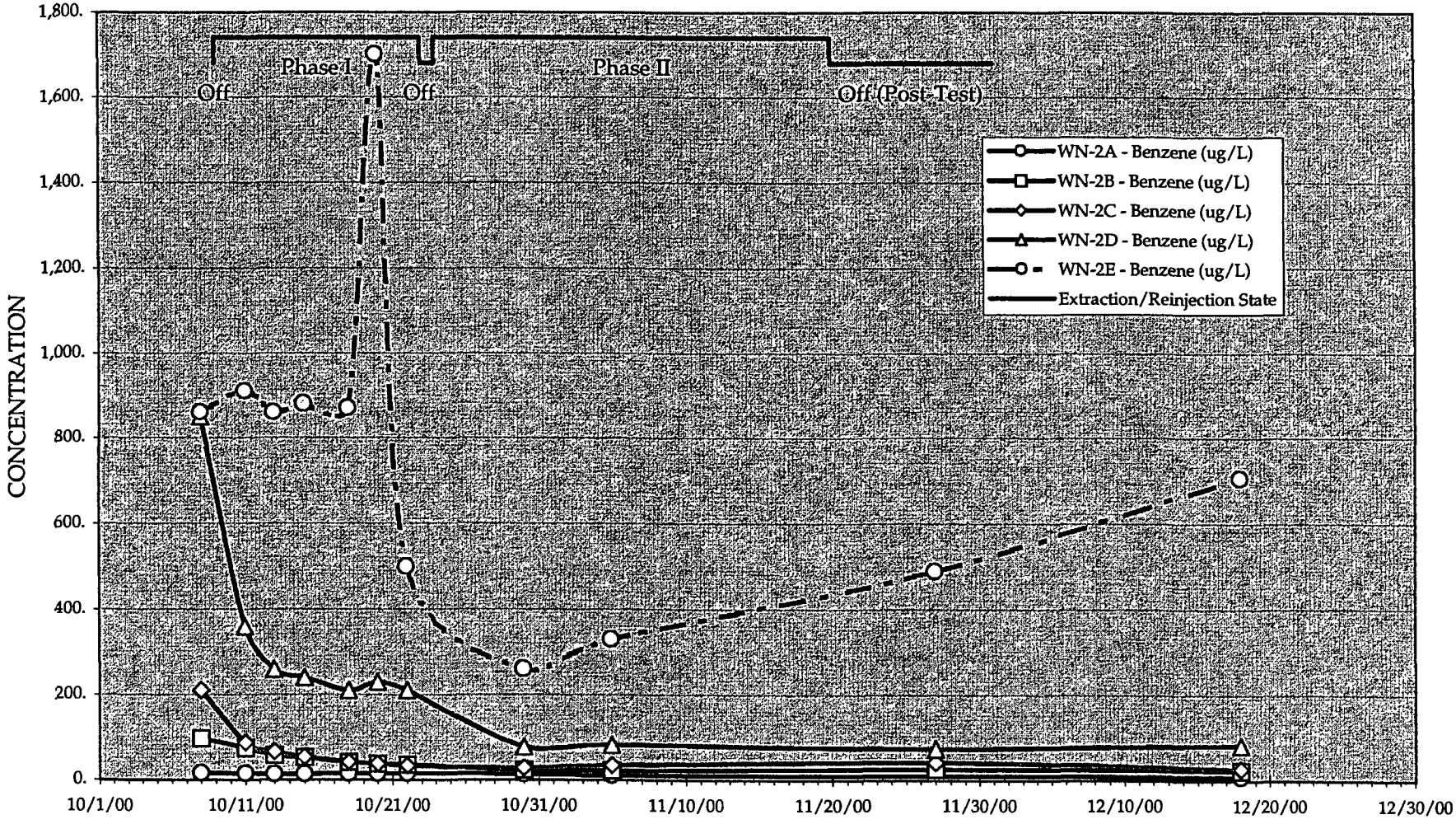


15670-App-N-Graphs14-15-16.xls WN2 Ammonia
3/22/01 9 29 AM

GRAPH 15
EXTRACTION/REINJECTION UNIT - WN-2A, WN-2B, WN-2C, WN-2D, WN-2E ANALYTICAL DATA
PHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

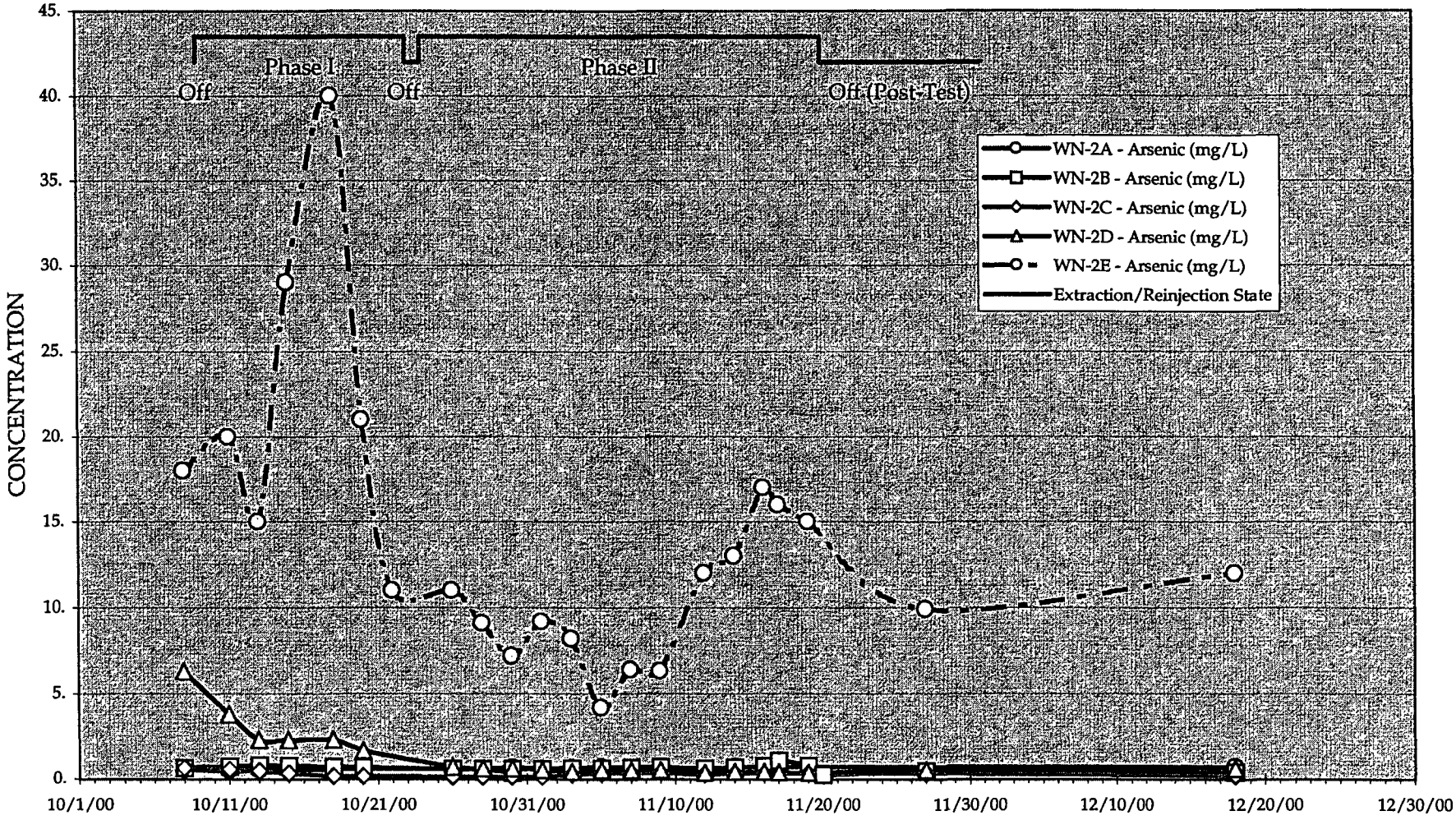


GRAPH 16
EXTRACTION/REINJECTION UNIT - WN-2A, WN-2B, WN-2C, WN-2D, WN-2E ANALYTICAL DATA
BENZENE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



15670-App-N-Graphs14-15-16.xls· WN2 Benzene
3/22/01 9·29 ^M

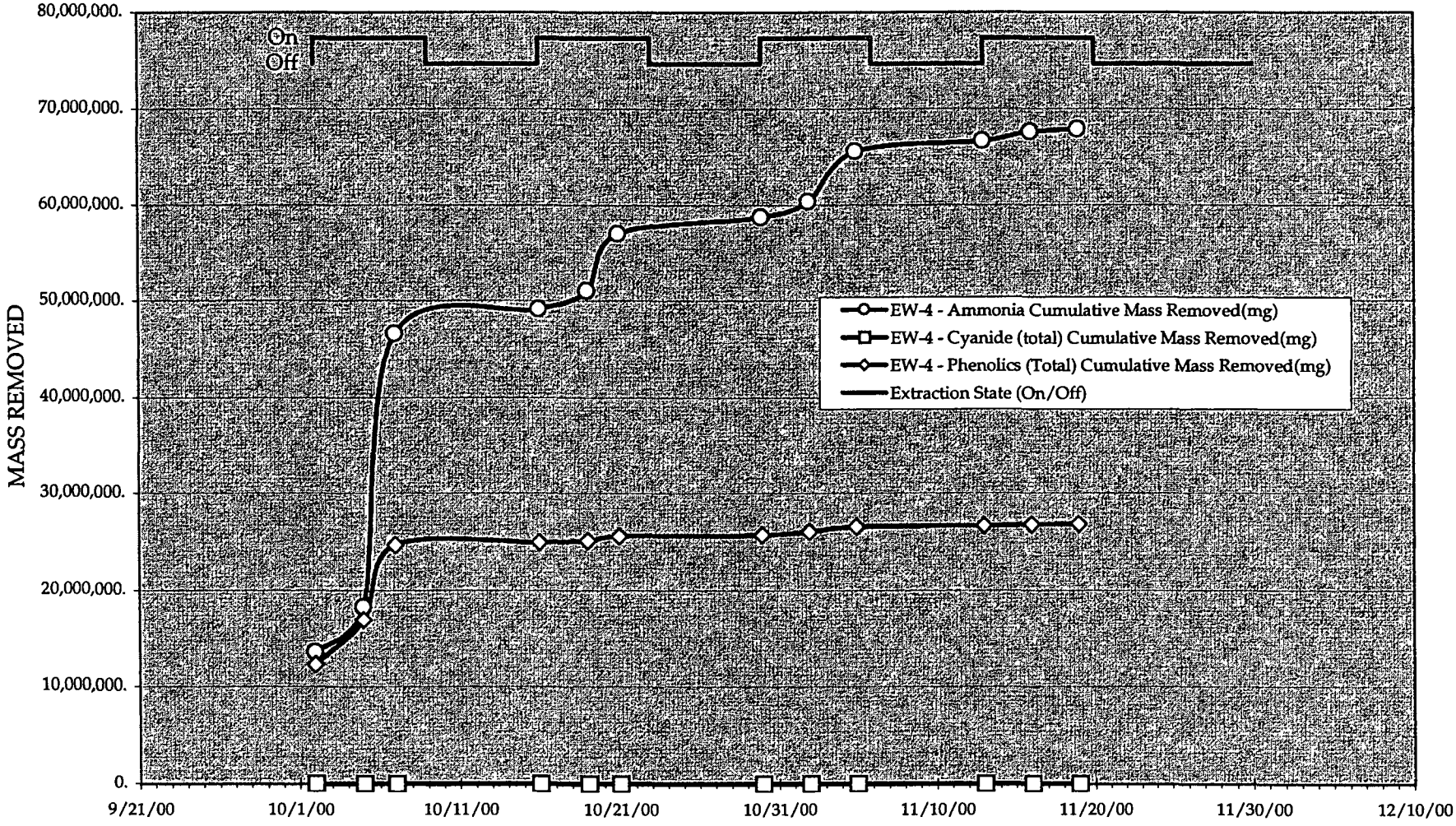
GRAPH 17
EXTRACTION/REINJECTION UNIT - WN-2A, WN-2B, WN-2C, WN-2D, WN-2E ANALYTICAL DATA
ARSENIC
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



APPENDIX O

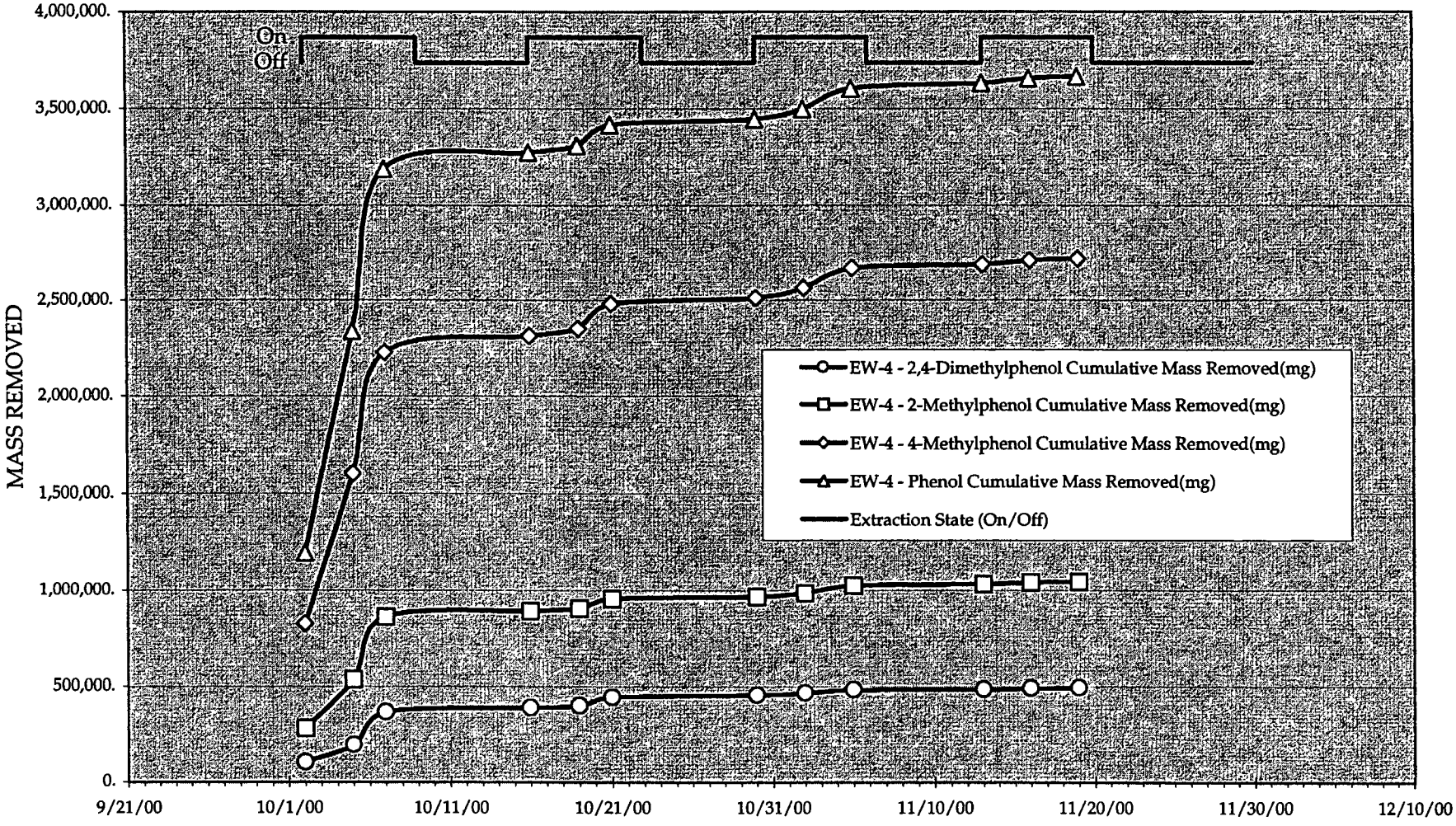
MASS REMOVAL GRAPHS

GRAPH 1
EXTRACTION UNIT - EW-4 MASS REMOVAL
AMMONIA, CYANIDE (TOTAL), PHENOLICS (TOTAL)
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

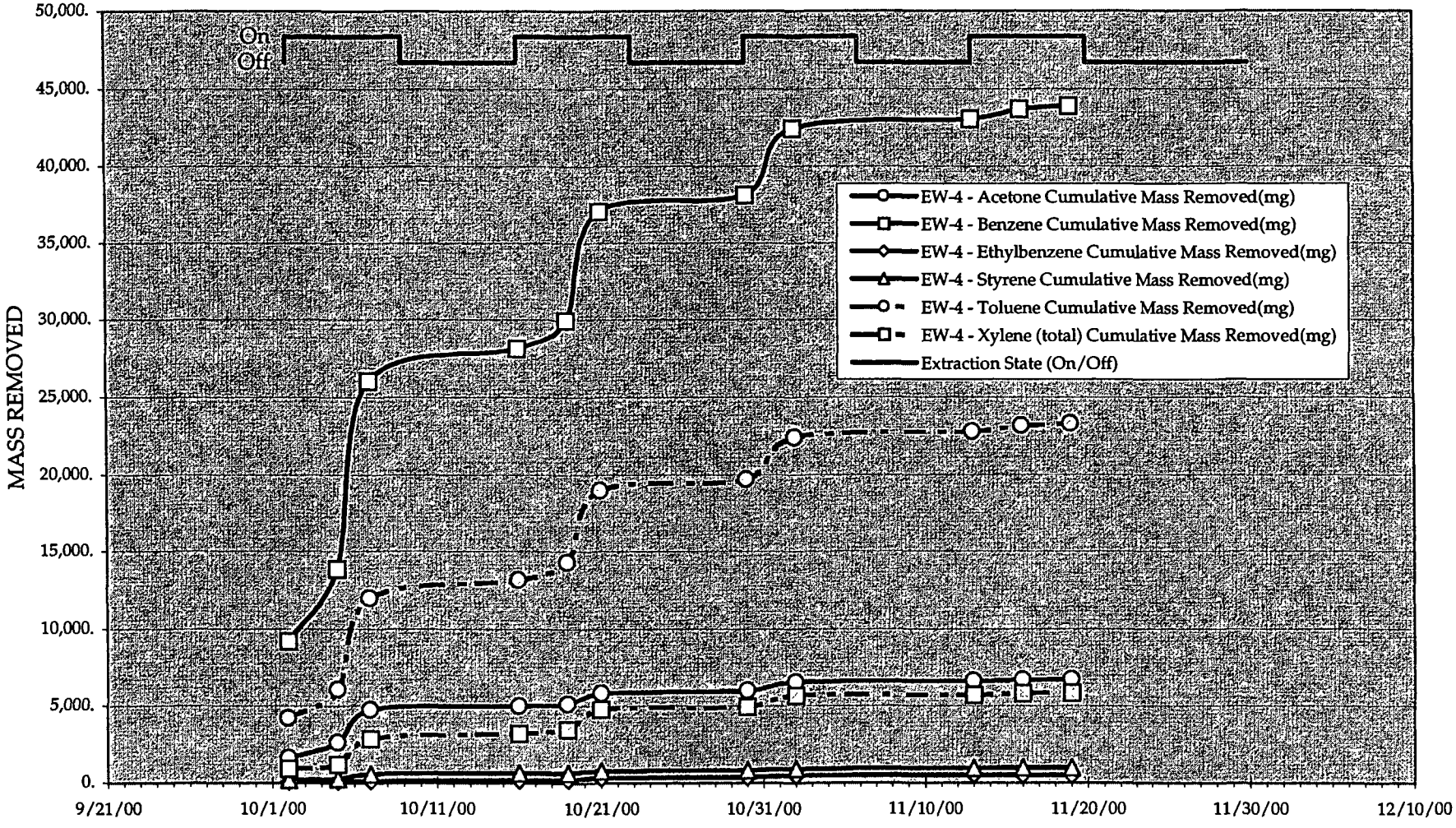


15670-AppO-Graphs1-4.xls. EW4 GenChem
3/22/01 9:58 AM

GRAPH 2
EXTRACTION UNIT - EW-4 MASS REMOVAL
2,4-DIMETHYLPHENOL, 2-METHYLPHENOL, 4-METHYLPHENOL, PHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

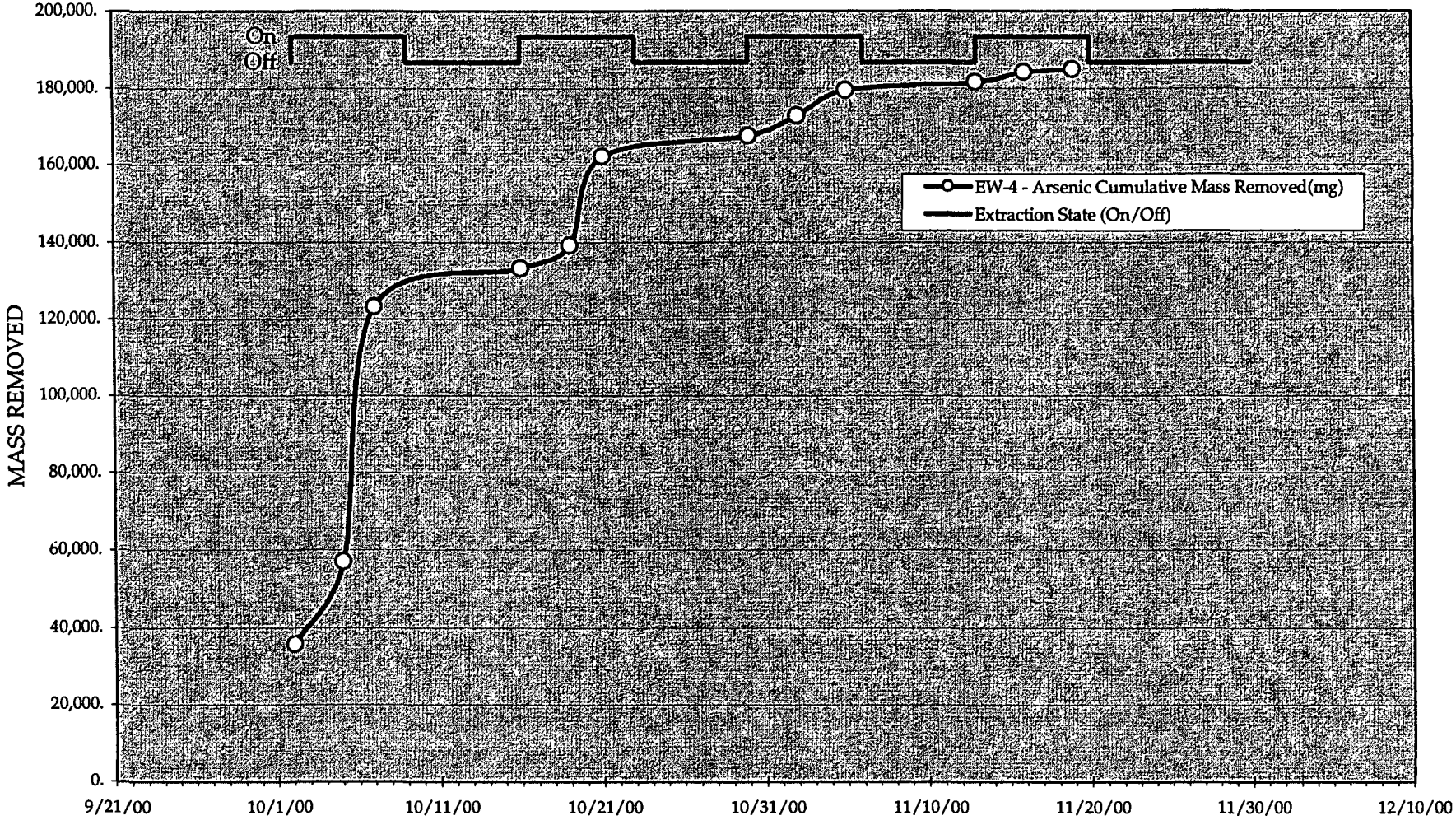


GRAPH 3
EXTRACTION UNIT - EW-4 MASS REMOVAL
ACETONE, BENZENE, ETHYLBENZENE, STYRENE, TOLUENE, XYLENE (TOTAL)
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



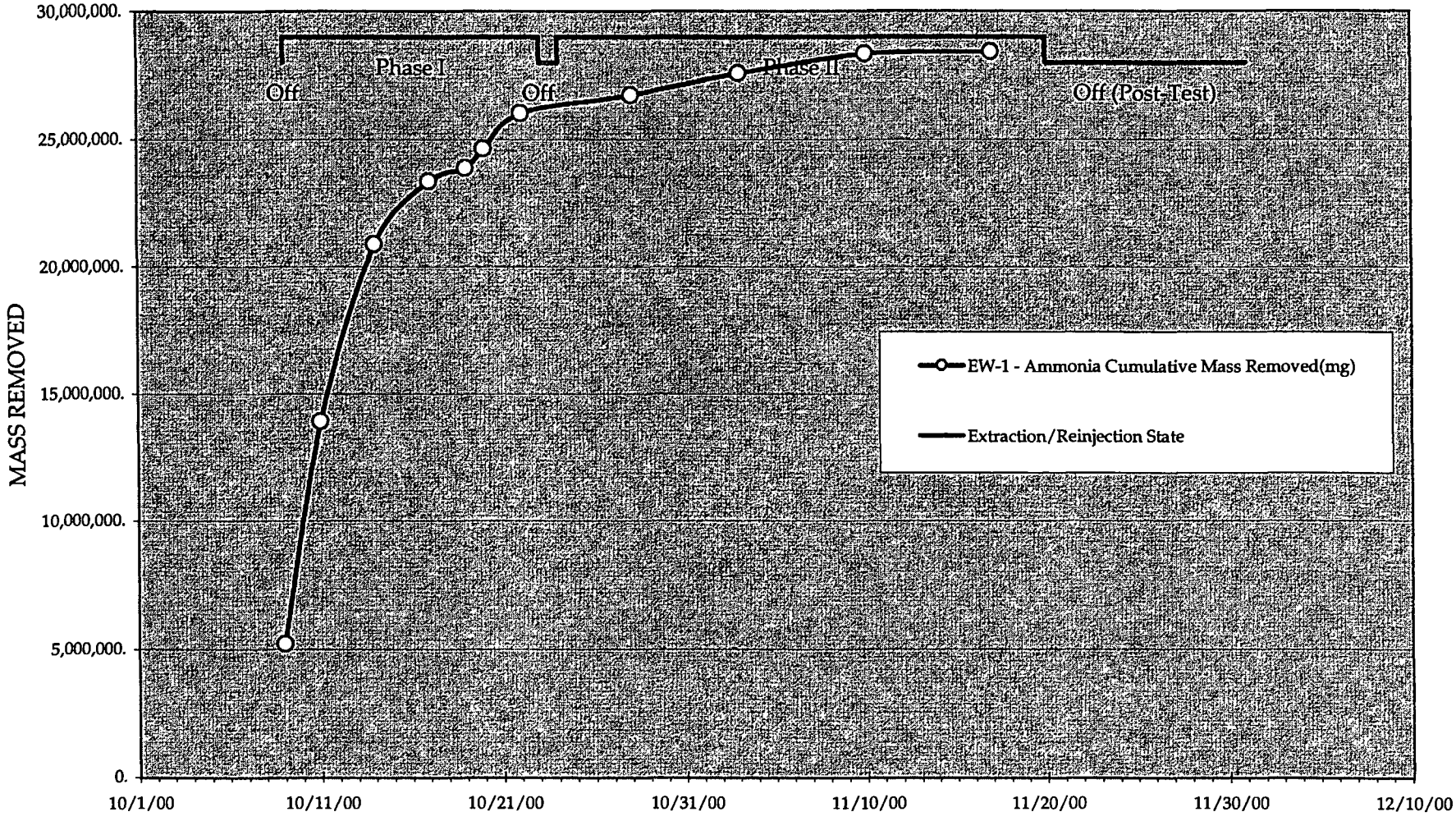
15670-AppO-Graphs1-4.xls: EW4 VOC
3/22/01 9.59 AM

GRAPH 4
EXTRACTION UNIT - EW-4 MASS REMOVAL
ARSENIC
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



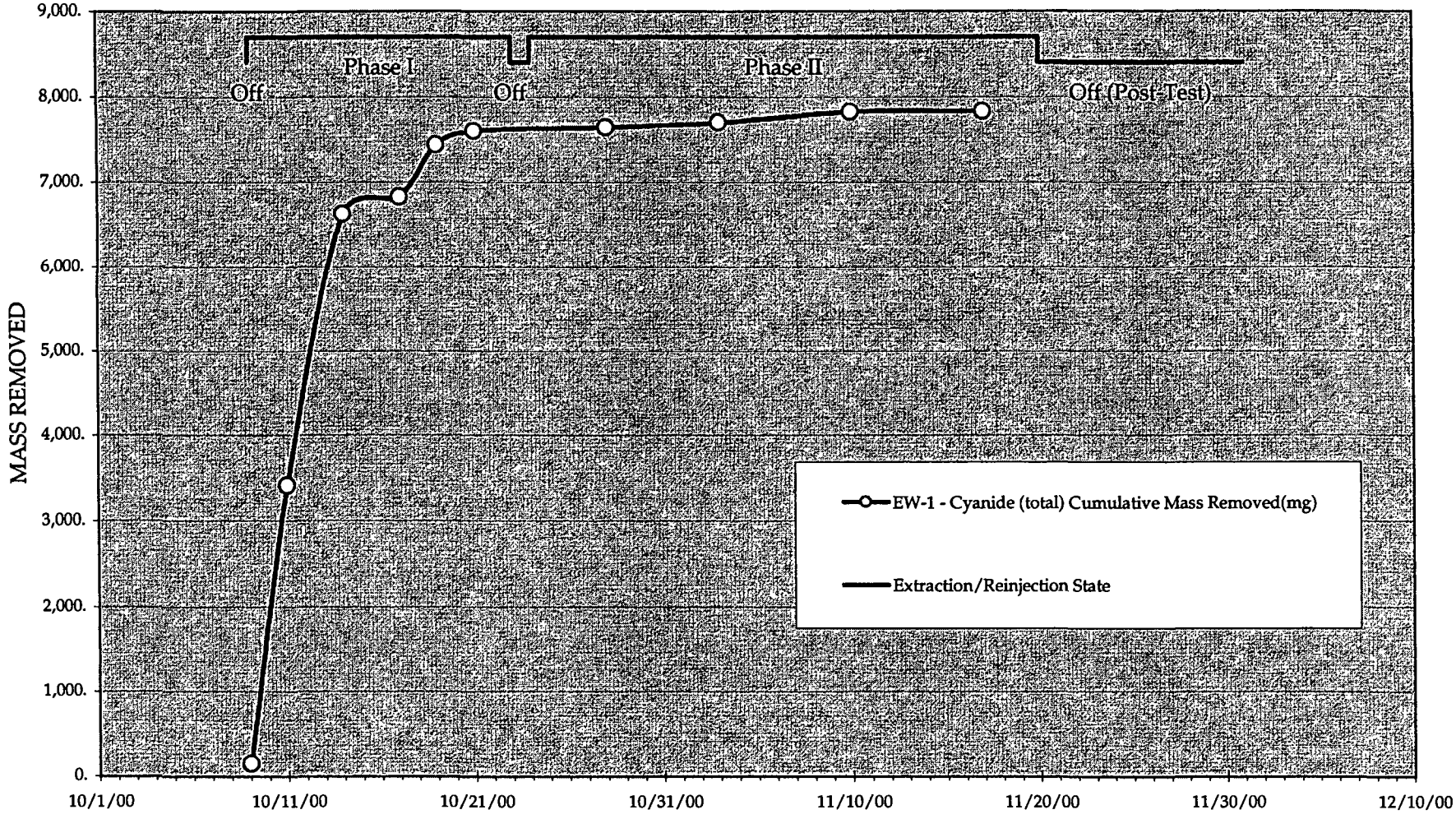
15670-AppO-Graphs1-4.xls: EW4 Arsenic
3/22/01 9.59 AM

GRAPH 5
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
AMMONIA
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



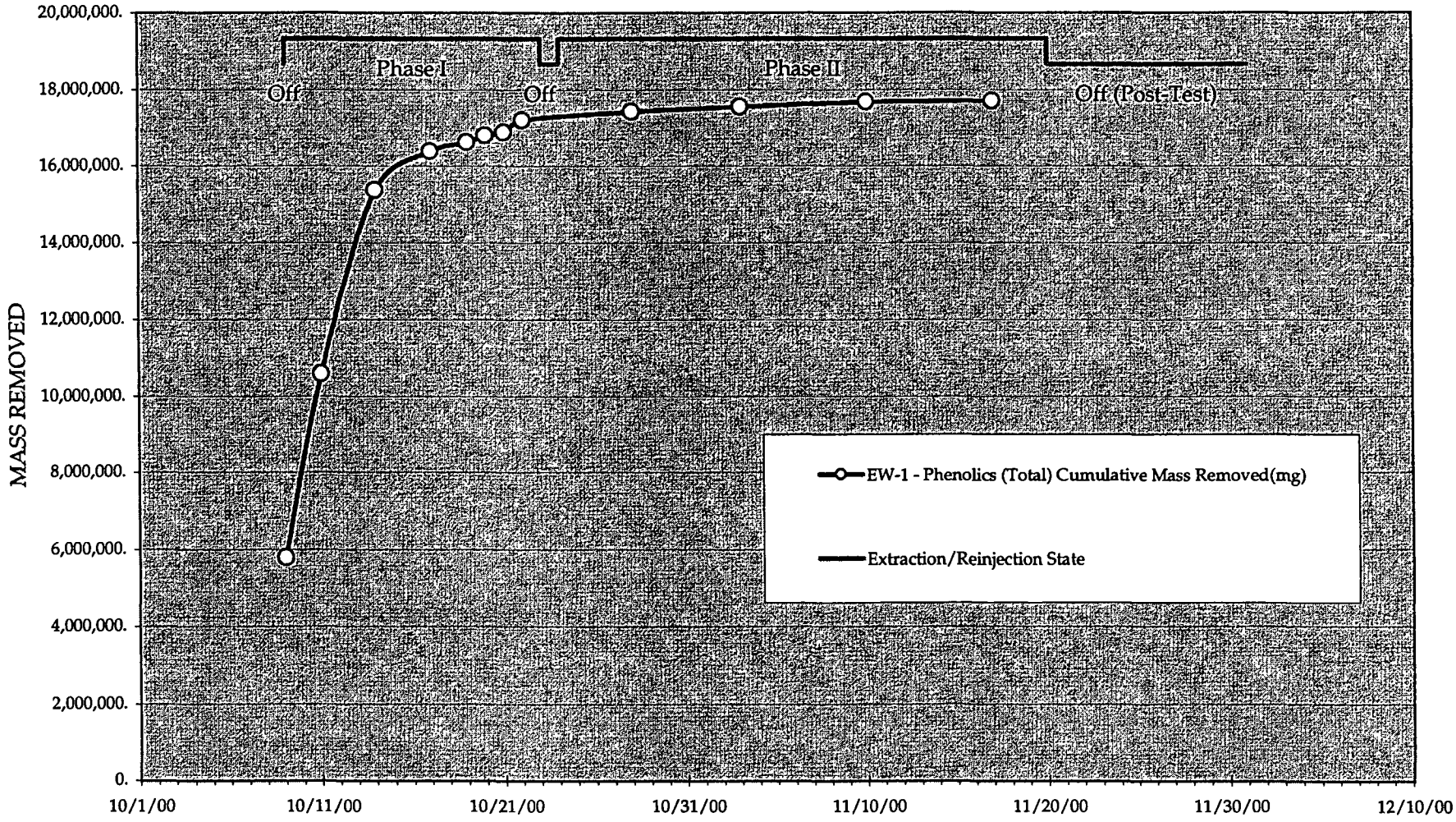
15670-App-O-Graphs5-15.xls· EW1 Ammonia
3/22/01 10 05 AM

GRAPH 6
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
CYANIDE (TOTAL)
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



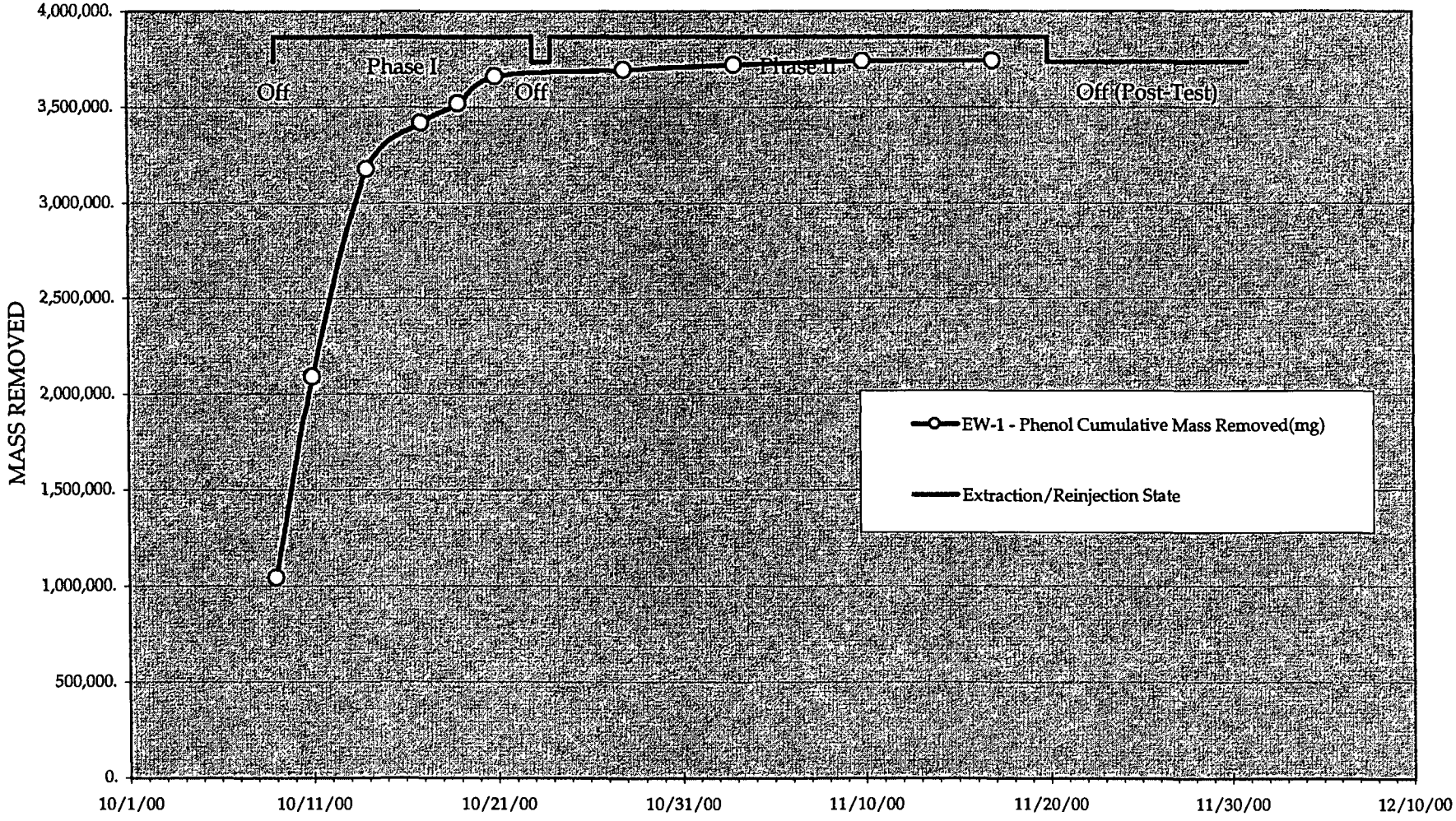
15670-App-O-Graphs5-15.xls: EW1 Cyanide
3/22/01 10.05 AM

GRAPH 7
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
PHENOLICS (TOTAL)
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



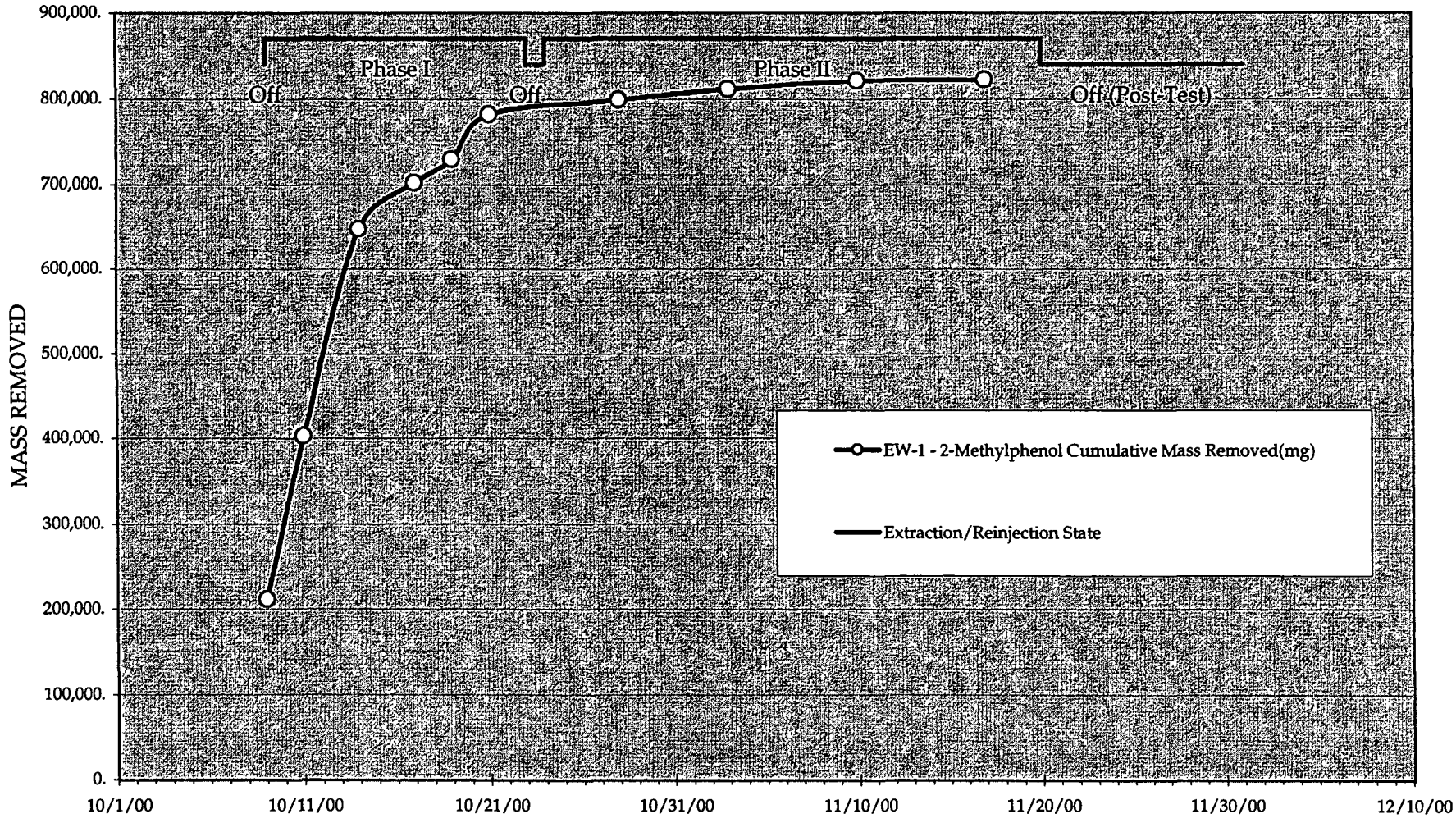
15670-App-O-Graphs5-15 xls. EW1 Phenolics
3/22/01 10.05 AM

GRAPH 8
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
PHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



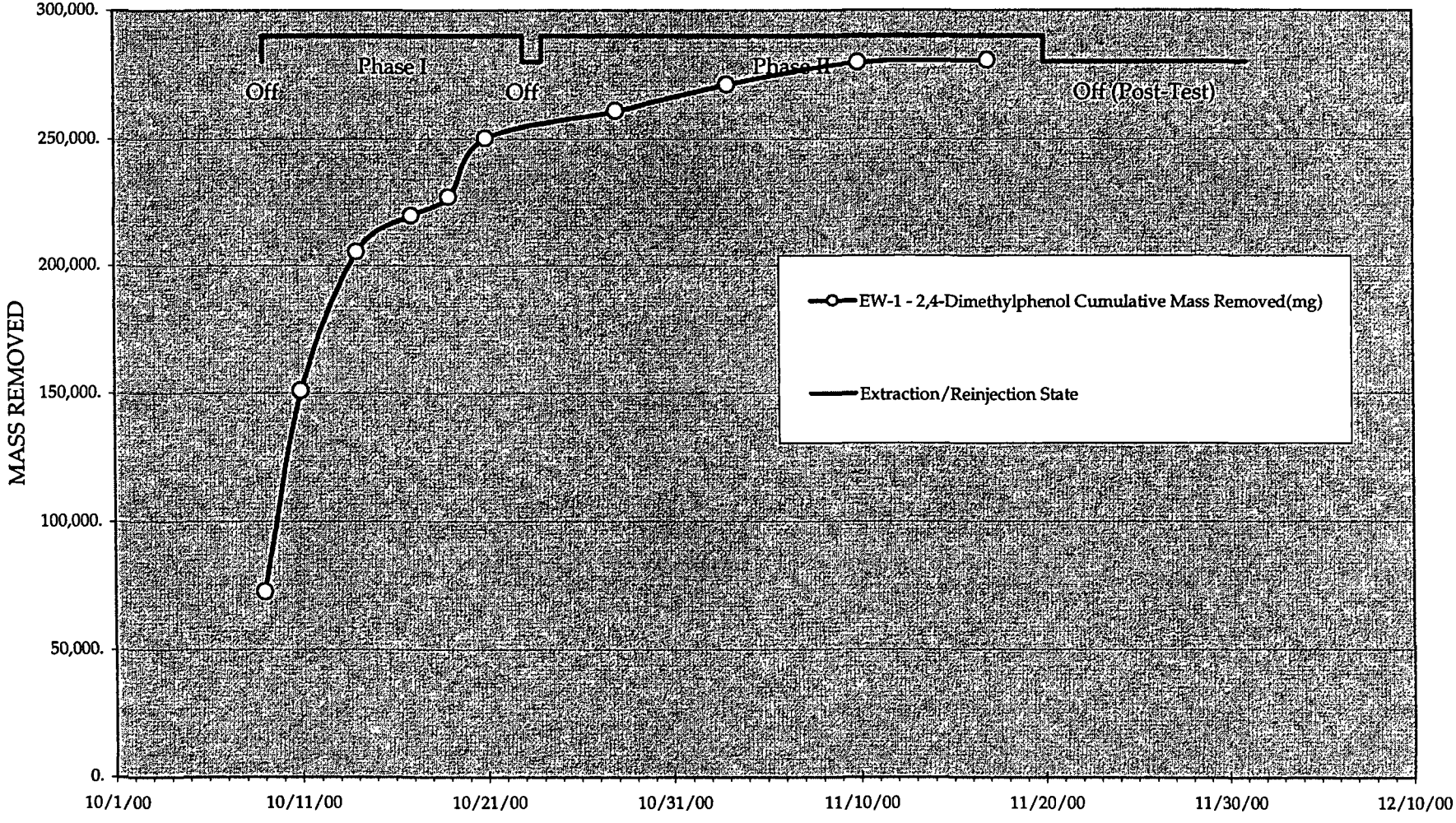
15670-App-O-Graphs5-15 xls: EW1 phenol
3/22/01 10:05 AM

GRAPH 9
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
2-METHYLPHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



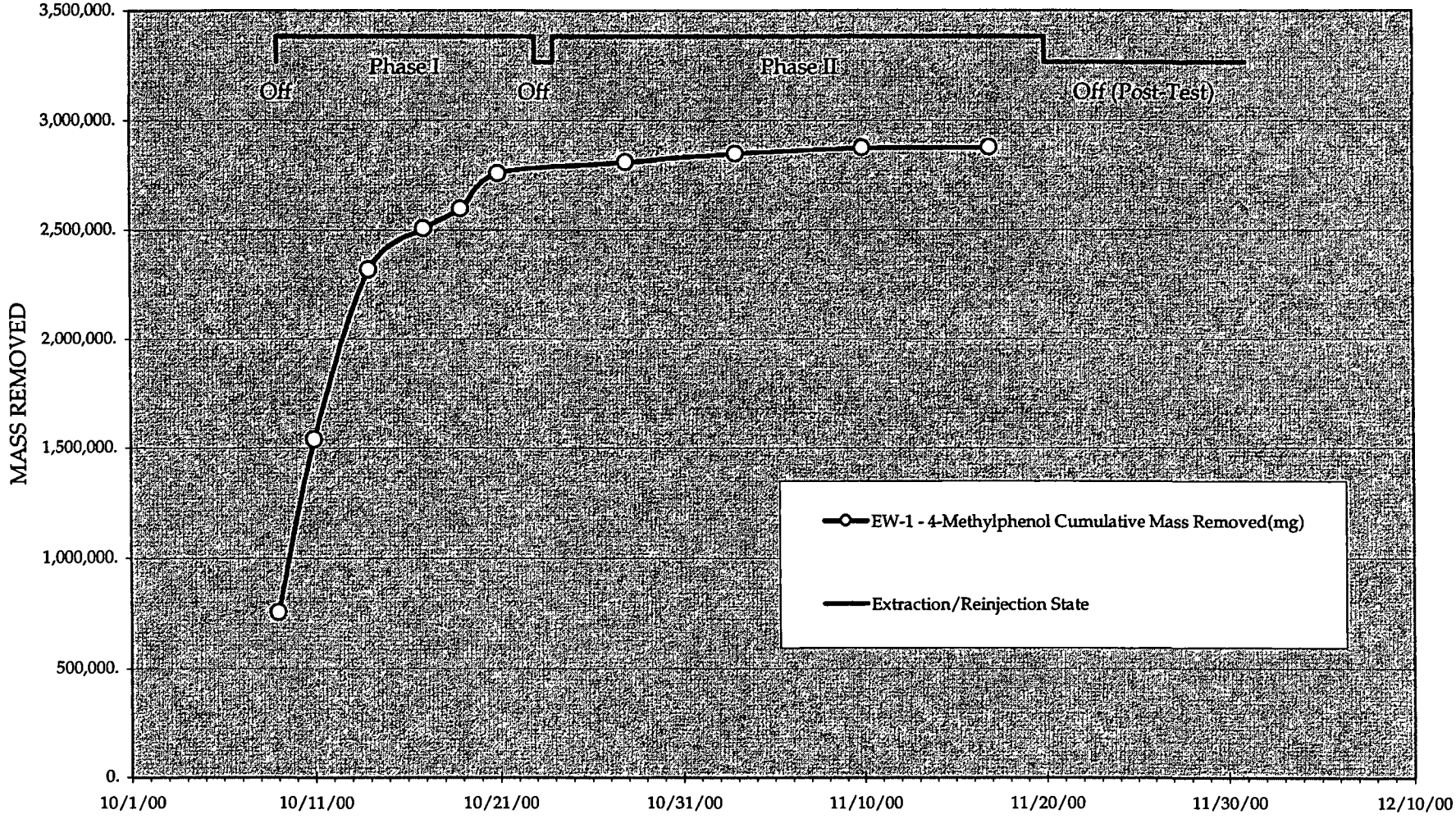
15670-App-O-Graphs5-15 xls: EW1 2methylphenol
3/22/01 10:05 AM

GRAPH 10
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
2,4-DIMETHYLPHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



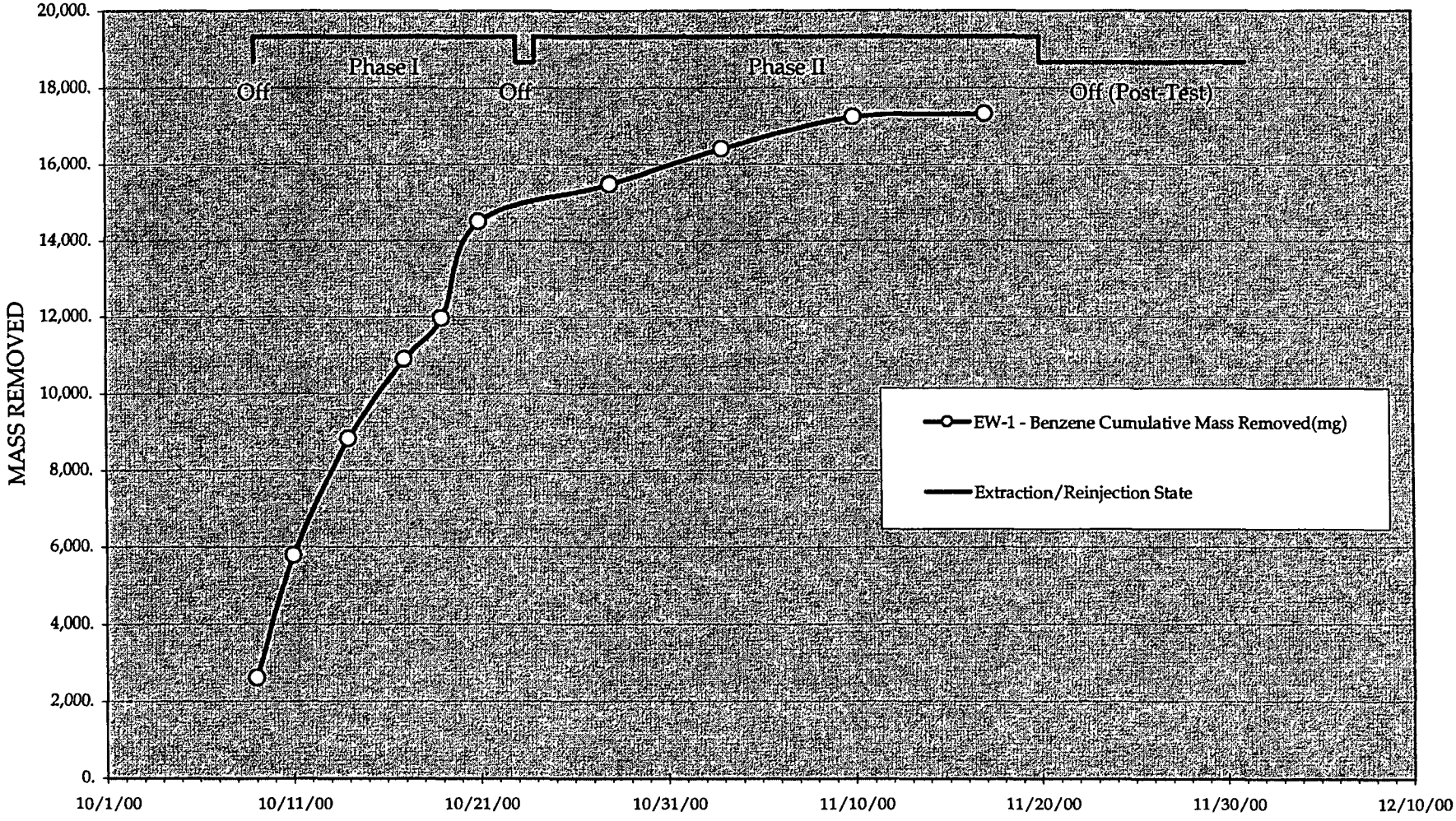
15670-App-O-Graphs5-15 xls EW1 24dimethylphenol
3/22/01 10 05 AM

GRAPH 11
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
4-METHYLPHENOL
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



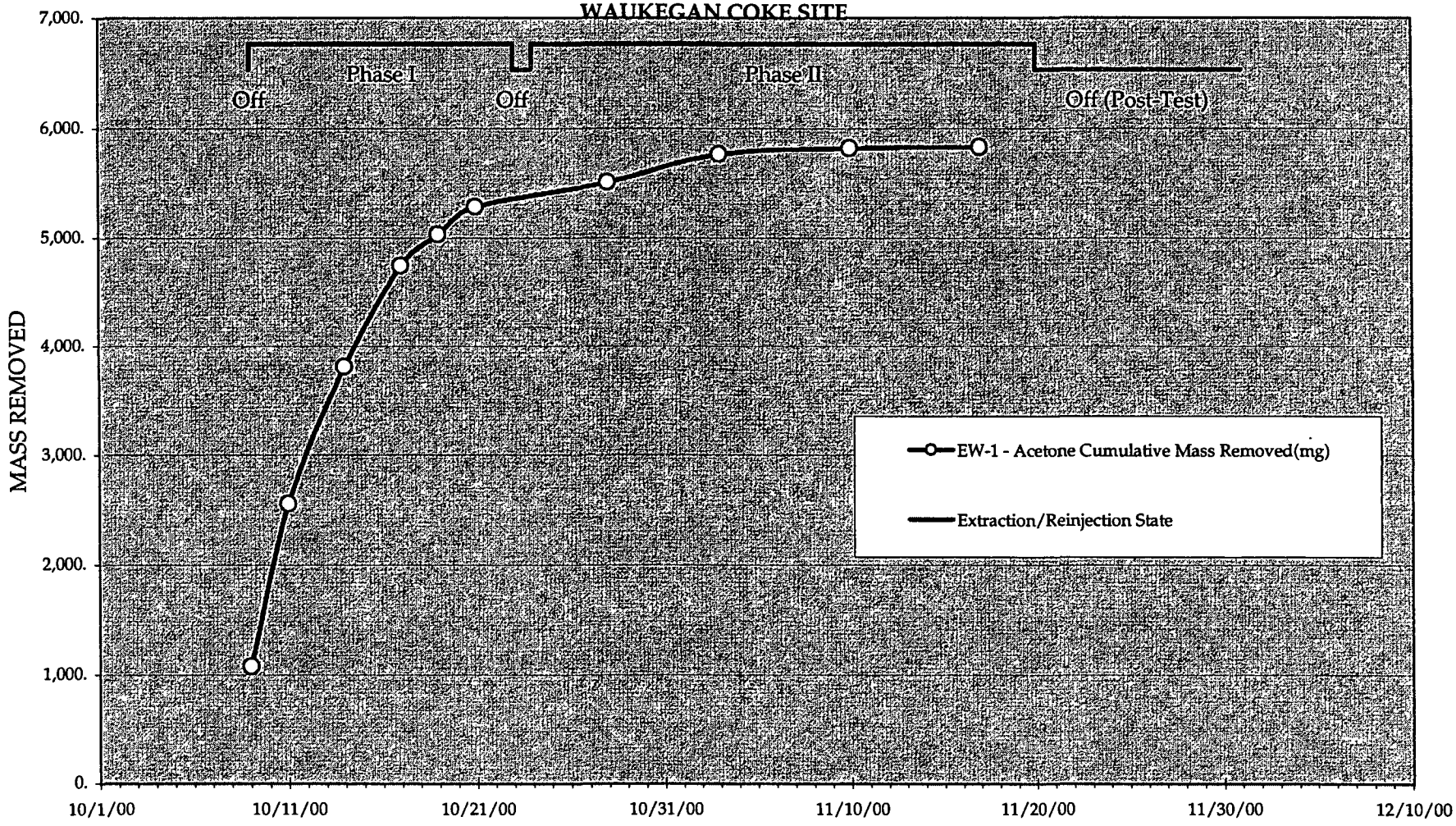
15670-App-O-Graphs5-15.xls: EW1 4methylphenol
3/22/01 10:05 AM

GRAPH 12
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
BENZENE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



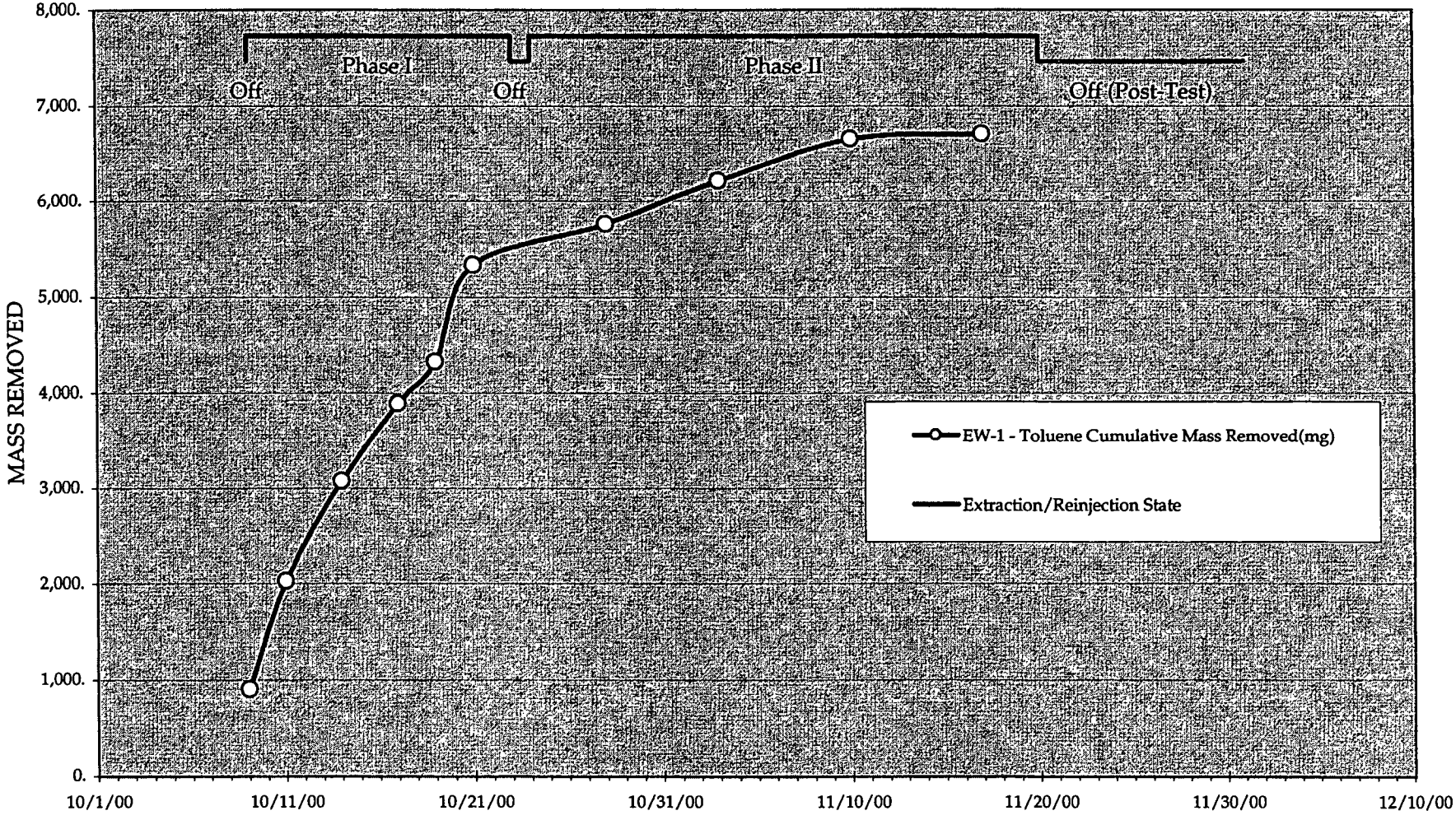
15670-App-O-Graphs5-15.xls. EW1 Benzene
3/22/01 10:05 AM

GRAPH 13
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
ACETONE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

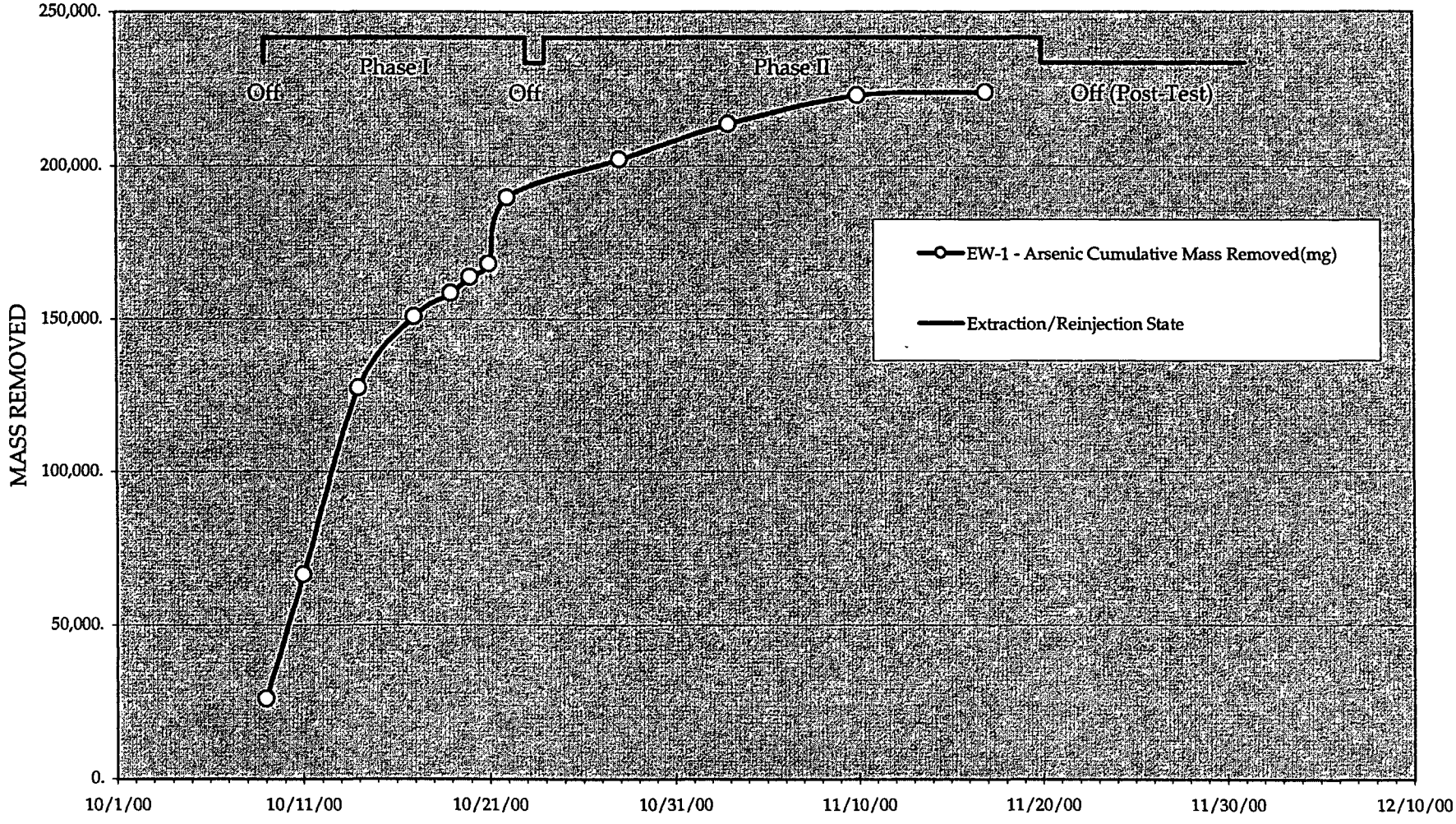


15670-App-O-Graphs5-15.xls. EW1 Acetone
3/22/01 10:06 AM

GRAPH 14
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
TOLUENE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



GRAPH 15
EXTRACTION/REINJECTION UNIT - EW-1 MASS REMOVAL
ARSENIC
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE

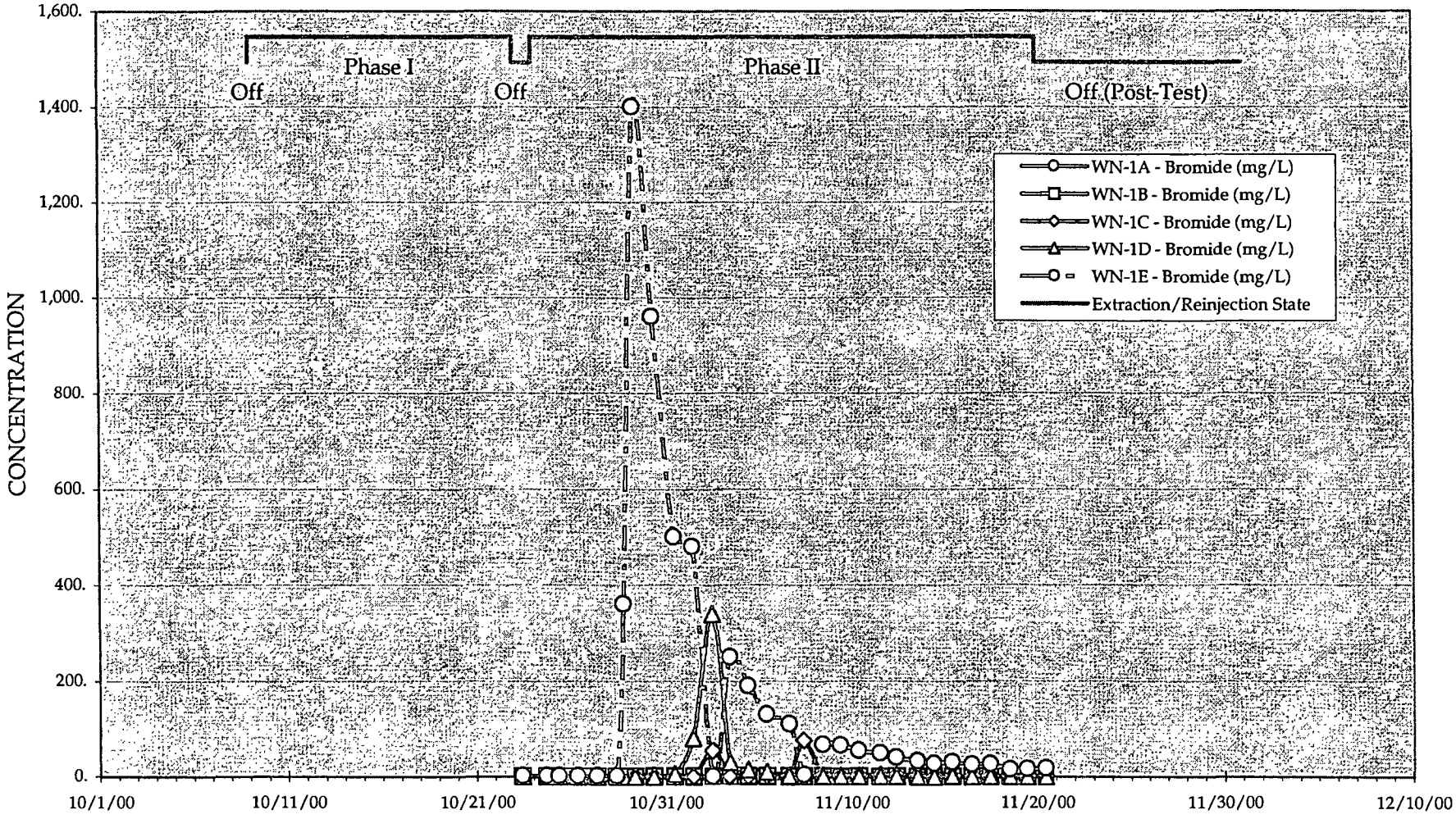


15670-App-O-Graphs5-15.xls: EW1 Arsenic
3/22/01 10:06 AM

APPENDIX P

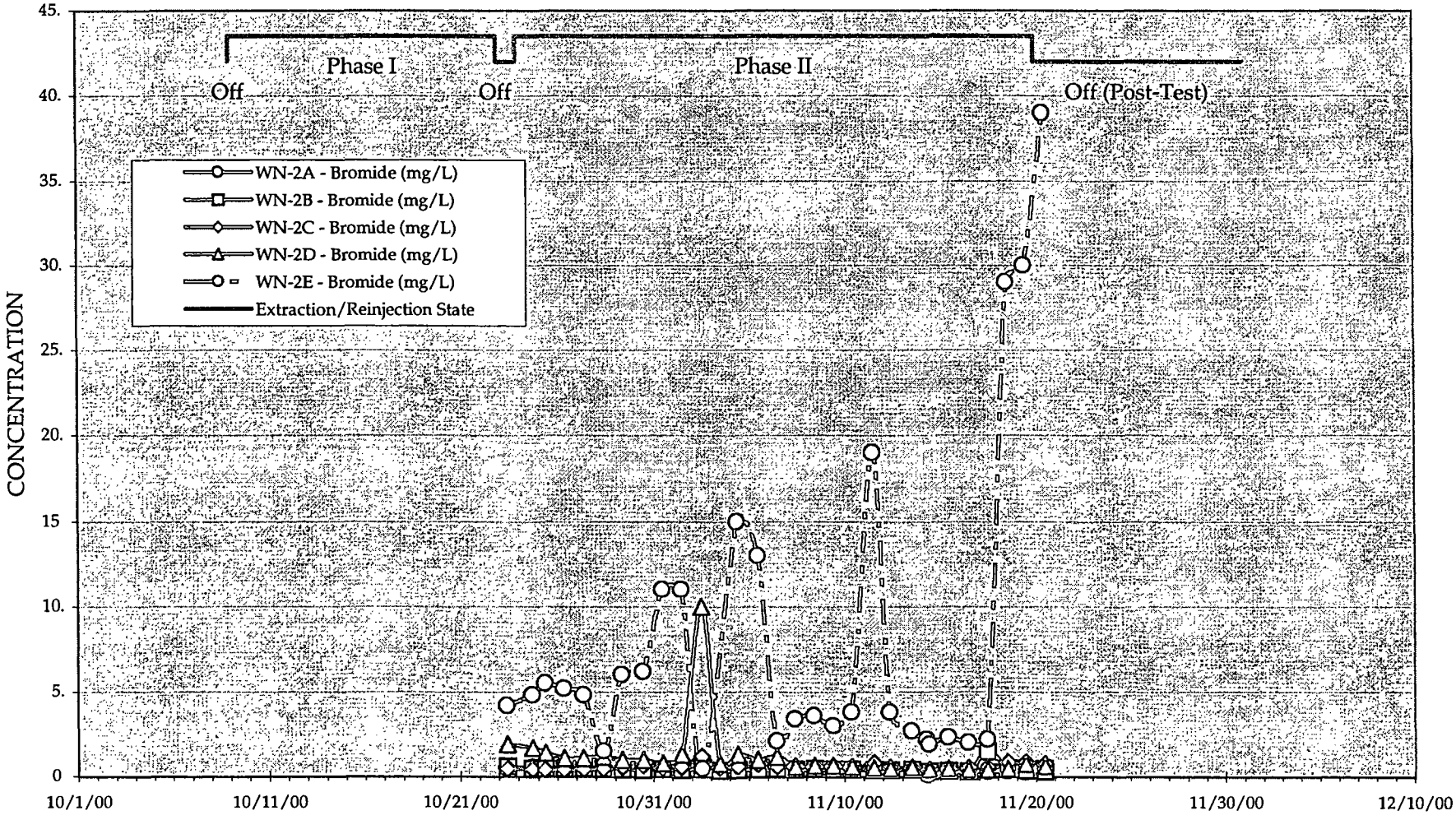
BROMIDE TRACER GRAPHS

GRAPH 1
EXTRACTION/REINJECTION UNIT - WN-1A, WN-1B, WN-1C, WN-1D, WN-1E ANALYTICAL DATA
BROMIDE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



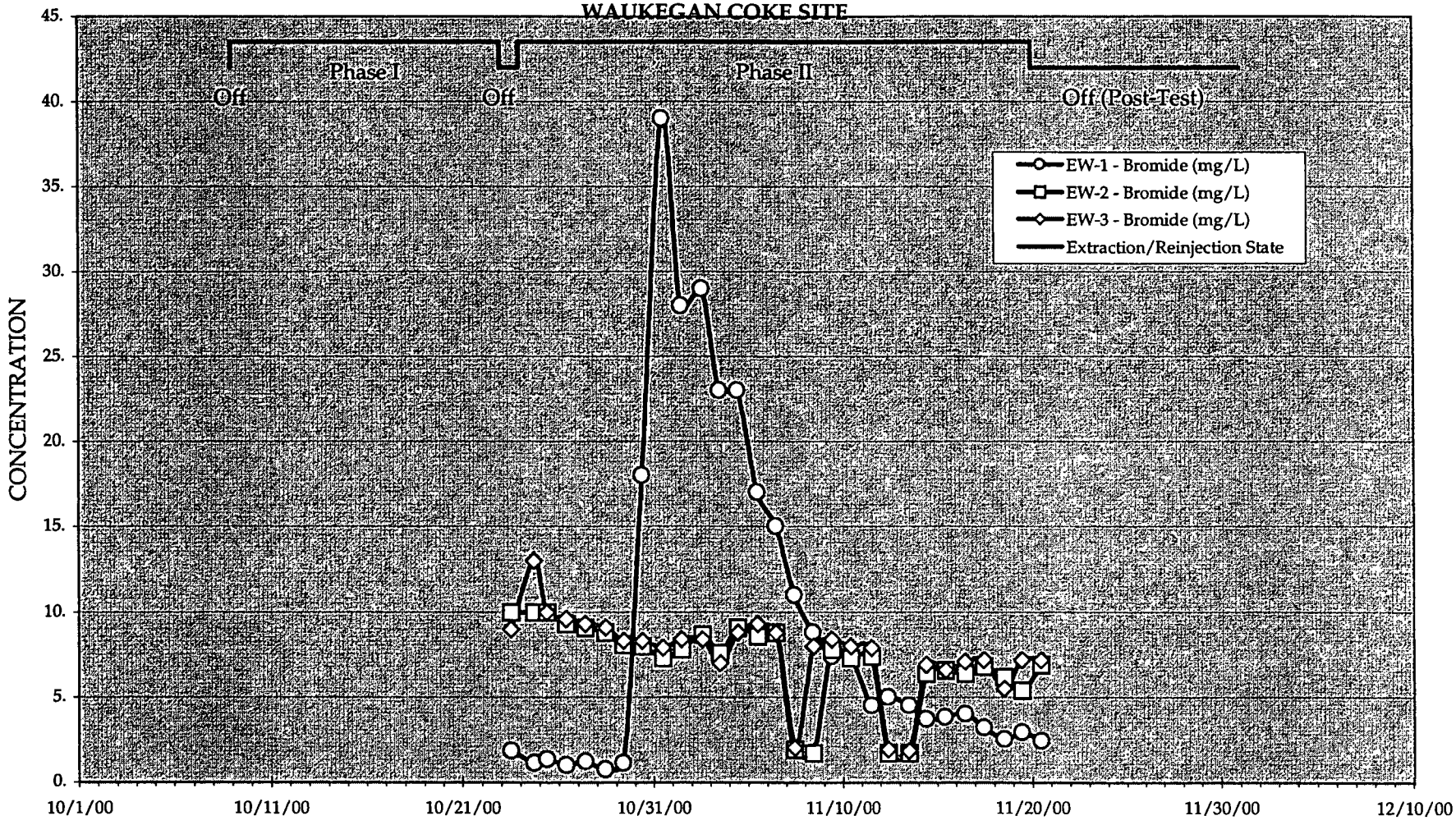
15670-App-P-Graphs1-4 xls WN1 Bromide
3/22/01 10 13 AM

GRAPH 2
EXTRACTION/REINJECTION UNIT - WN-2A, WN-2B, WN-2C, WN-2D, WN-2E ANALYTICAL DATA
BROMIDE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



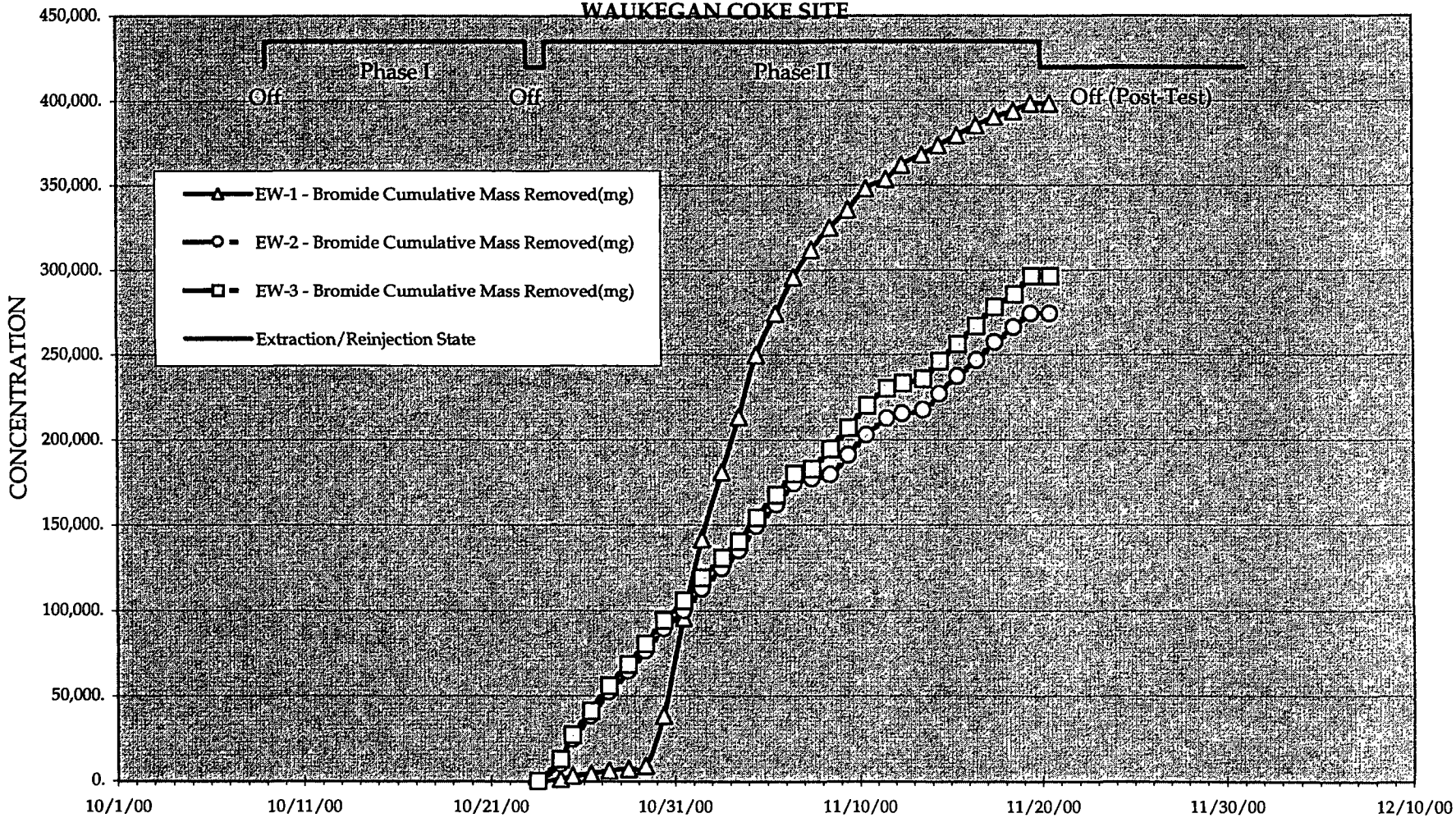
15670-App-P-Graphs1-4 .xls WN2 Bromide
3/22/01 10 13 AM

GRAPH 3
EXTRACTION/REINJECTION UNIT - ANALYTICAL DATA
WELLS EW-1, EW-2, EW-3
BROMIDE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



15670-App-P-Graphs1-4 .xls: EW123 Bromide
6/14/01 1:03 PM

GRAPH 4
EXTRACTION/REINJECTION UNIT - MASS RECOVERY
WELLS EW-1, EW-2, EW-3, EW-1, EW-2, EW-3
BROMIDE
PRE-DESIGN PILOT STUDY
WAUKEGAN COKE SITE



APPENDIX Q

HYDRAULIC CONDUCTIVITY CALCULATIONS

APPENDIX Q

SUMMARY OF TRACER TEST TRANSPORT EVALUATION
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS

Well location	*Tracer Travel Time (days)*	*Distance From RW-2 (feet)*	*Estimated Horizontal Groundwater Velocity (V=distance/time)*	*Porosity*	*Average Groundwater Elevation RW-2 (feet AMSL)*	*Average Groundwater Elevation Monitoring Point (feet AMSL)*	*Distance Between Points (feet)*	*Horizontal Hydraulic Gradient (ft/ft)*	*Calculated Hydraulic Conductivity (feet/day)*
WN-1E	4.29	5.4	1.26	0.38	581.26	580.98	5.4	0.052	9.2
WN-1D	8	5.4	0.68	0.38	581.26	581.02	5.4	0.044	5.8
WN-1C	9.06	5.4	0.60	0.38	581.26	581.08	5.4	0.033	6.9
								Average	7.3 feet/day
EW-1	5.92	10.2	1.72	0.38	581.26	580.27	10.2	0.097	6.7

BROMIDE TRACER TEST CALCULATIONS
WAUKEGAN COKE SITE

Known Information Distances

RW-2 to WN-1 = 5.4 feet
RW-2 to EW-1 = 10.2 feet

Injected Bromide Tracer RW-2 @ 08:30 10/24/00

Started Phase II Test (i.e., pumps on) @ 11:00 10/24/00

Detection of Bromide Front

Location	*Date*	*Time*	*# Days*	*Concentration (mg/L)*
WN-1E	10/28/00	18:04	4.29	360
WN-1D	11/01/00	10:59	8	81
WN-1C	11/02/00	12:23	9.06	54
WN-1B	NA	-	-	-
WN-1A	NA	-	-	-
EW-1	10/30/00	9:06	5.92	18

Effective Porosity (η_e) = unknown

Average Porosity (η) = 0.38 or 38%
(RI Report Table 4.6.3)

Known Information

$$V = \frac{Ki}{n}$$

where:

V = Average Groundwater Velocity
K = Horizontal Hydraulic Conductivity
i = Horizontal Hydraulic Conductivity
η = porosity

then

$$V = \frac{Vn}{i}$$

1. **WN-1E**

Distance = 5.4 feet Time = 4.29 days

then $V = \frac{5.4 \text{ feet}}{4.29 \text{ days}} = 1.26 \text{ ft/day}$

Average Groundwater Elevations RW-2 = 581.26 WN-1E = 580.98

then $i = \frac{581.26 - 580.98}{5.4 \text{ ft}} = 0.052 \text{ ft/ft}$

then $K = \frac{1.26 \text{ ft/day} \bullet 0.38}{0.052} = 9.2 \text{ ft/day}$

BROMIDE TRACER TEST CALCULATIONS
WAUKEGAN COKE SITE

2. **WN-1D**

Distance = 5.4 feet Time = 8 days

then $V = \frac{5.4 \text{ feet}}{8 \text{ days}} = 0.675 \text{ ft/day}$

Average Groundwater Elevations RW-2 = 581.26 WN-1D = 581.02

then $i = \frac{581.26 - 581.02}{5.4 \text{ ft}} = 0.044 \text{ ft/ft}$

then $K = \frac{0.675 \text{ ft/day} \bullet 0.38}{0.044} = 5.8 \text{ ft/day}$

3. **WN-1C**

Distance = 5.4 feet Time = 9.06 days

then $V = \frac{5.4 \text{ feet}}{9.06 \text{ days}} = 0.60 \text{ ft/day}$

Average Groundwater Elevations RW-2 = 581.26 WN-1C = 581.08

then $i = \frac{581.26 - 581.08}{5.4 \text{ ft}} = 0.033 \text{ ft/ft}$

then $K = \frac{0.60 \text{ ft/day} \bullet 0.38}{0.033 \text{ ft/ft}} = 6.9 \text{ ft/day}$

4. **EW-1**

Distance = 10.2 feet Time = 5.92 days

then $V = \frac{10.2 \text{ feet}}{5.92 \text{ days}} = 1.72 \text{ ft/day}$

Average Groundwater Elevations RW-2 = 581.26 EW-1 = 580.27

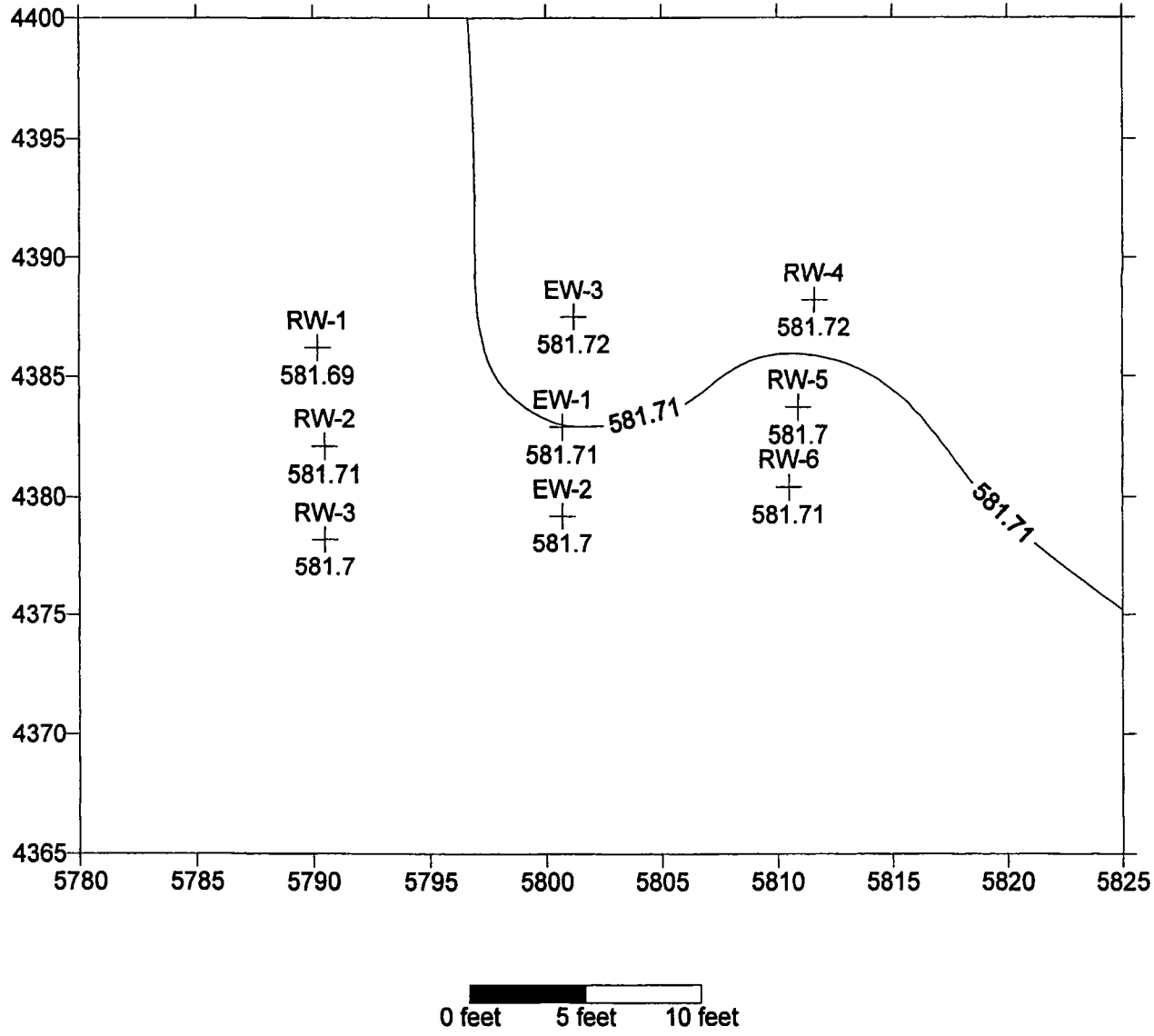
then $i = \frac{581.26 - 580.27}{10.2 \text{ ft}} = 0.097 \text{ ft/ft}$

then $K = \frac{1.72 \text{ ft/day} \bullet 0.38}{0.097} = 6.7 \text{ ft/day}$

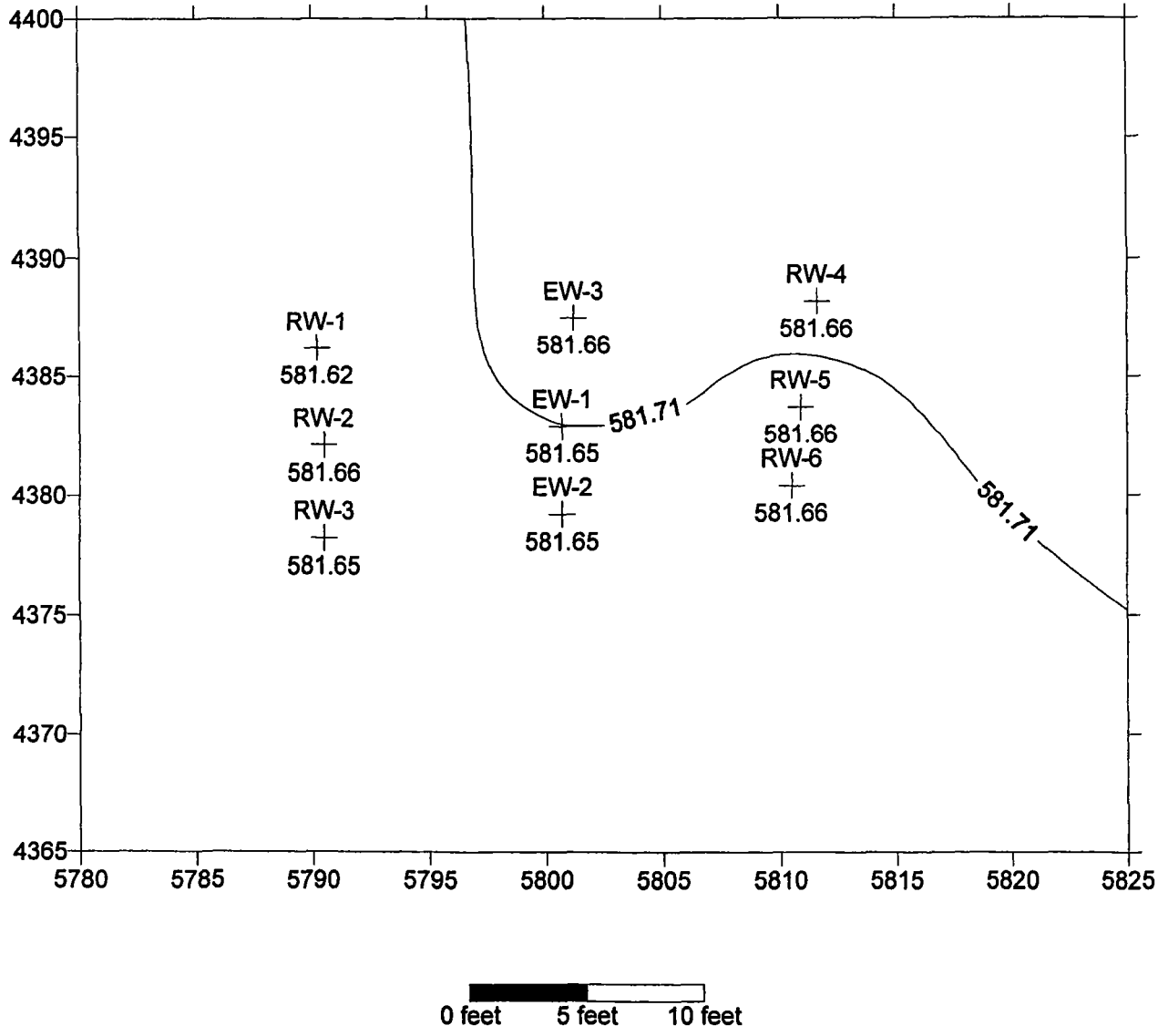
APPENDIX R

E/R UNIT GROUNDWATER CONTOURS

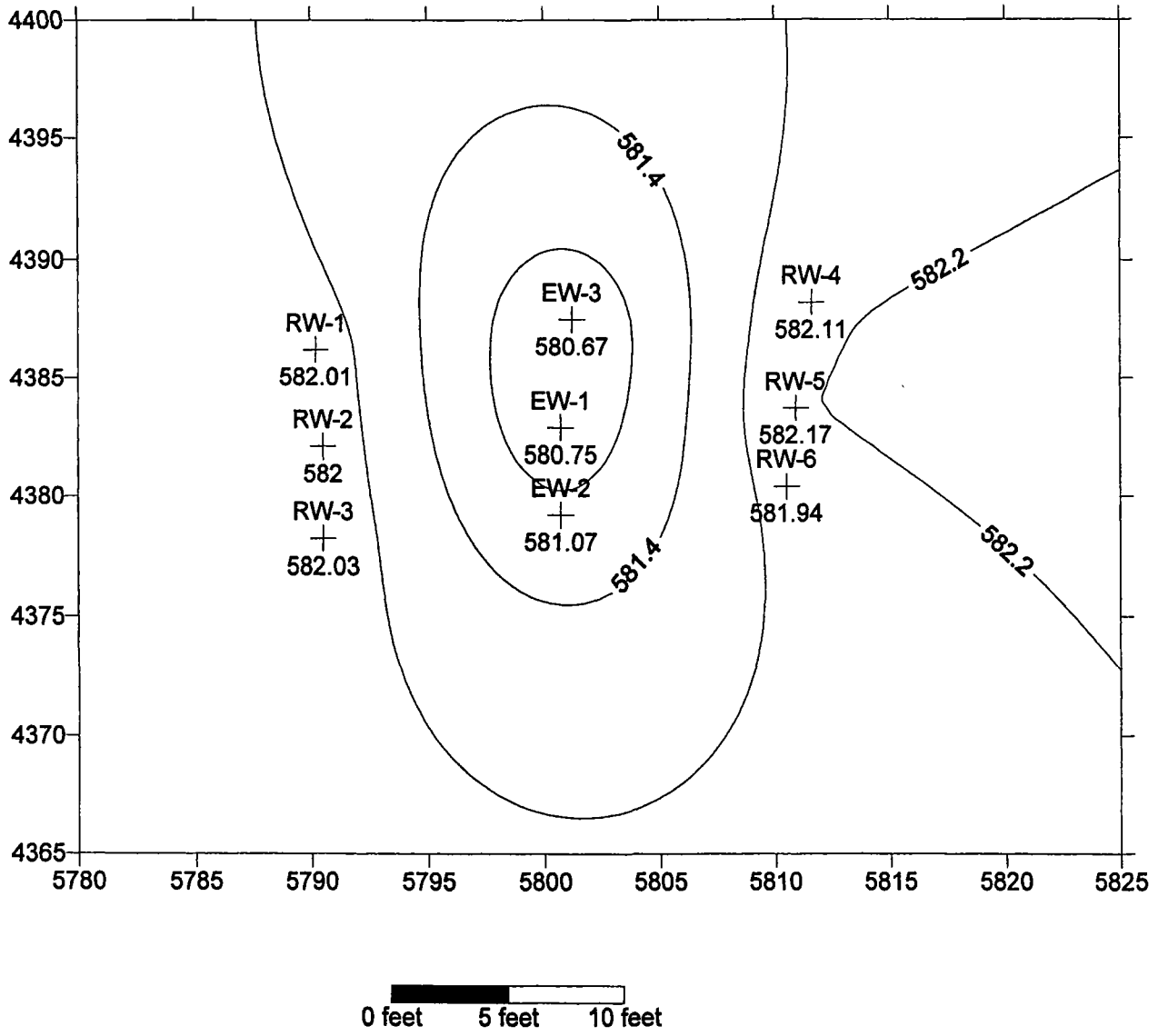
PLOT 1
PRE-TEST GROUNDWATER CONTOURS- OCTOBER 8, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



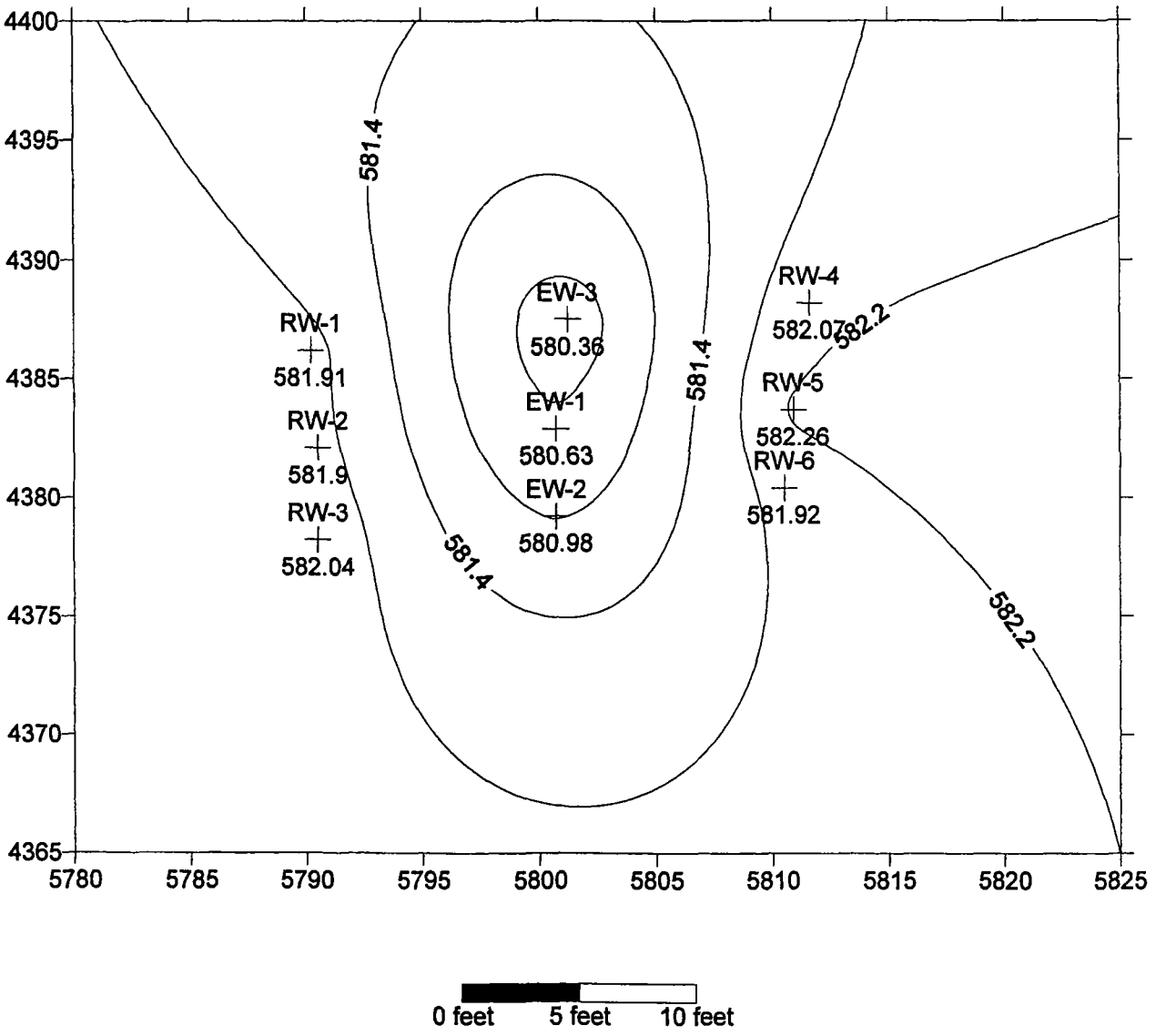
PLOT 2
PRE-TEST GROUNDWATER CONTOURS- OCTOBER 9, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



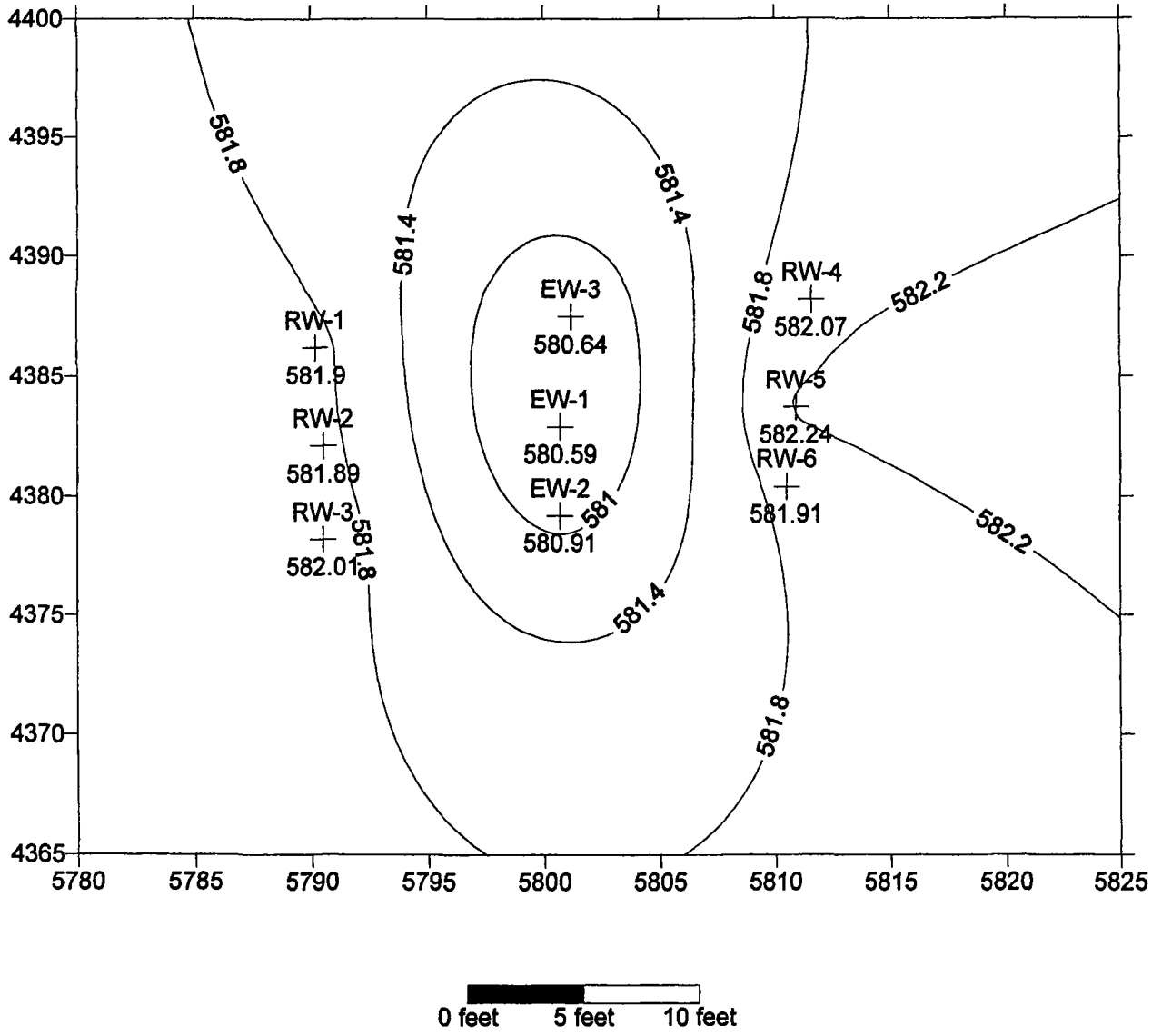
PLOT 3
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 10, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



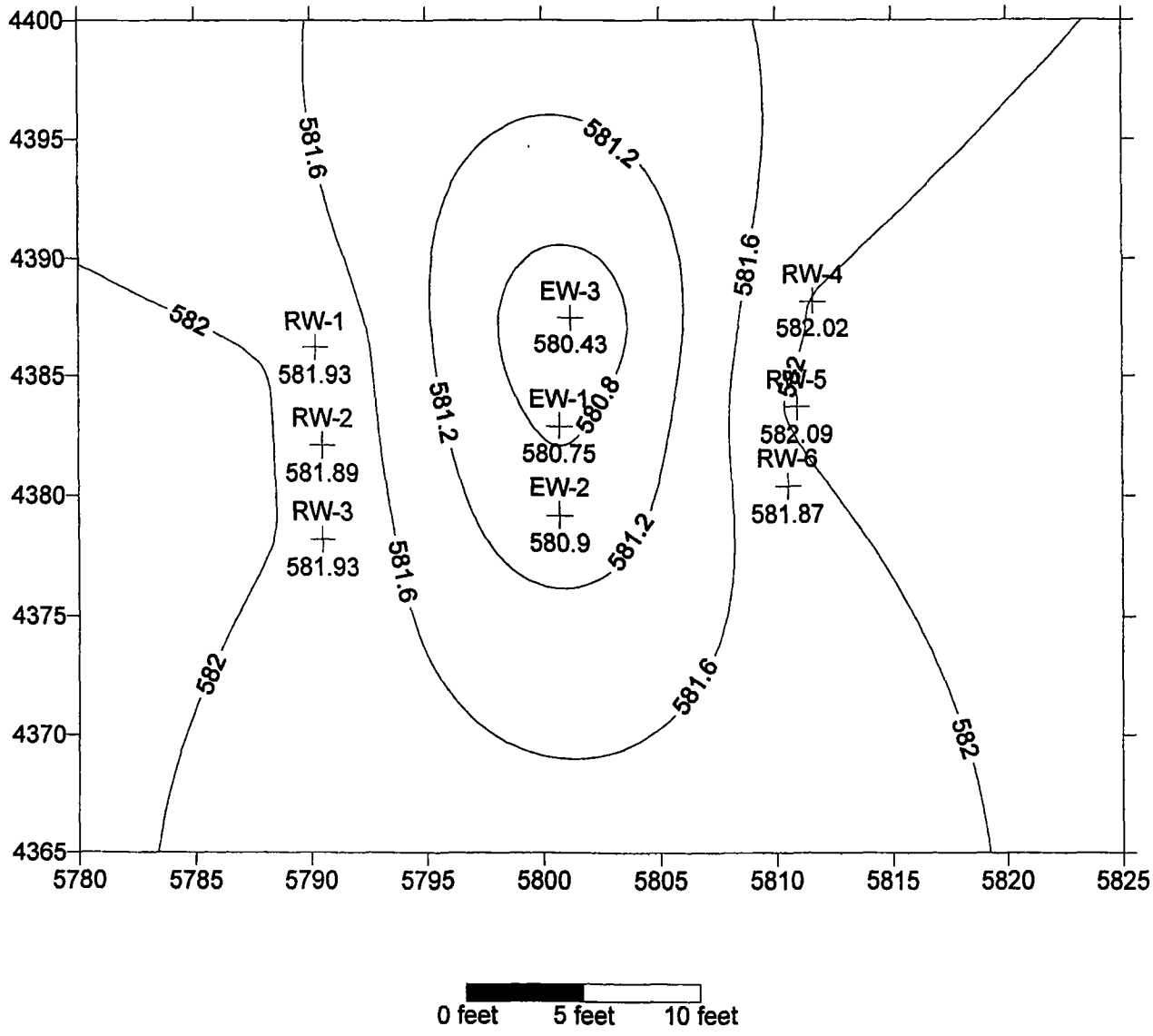
PLOT 4
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 11, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



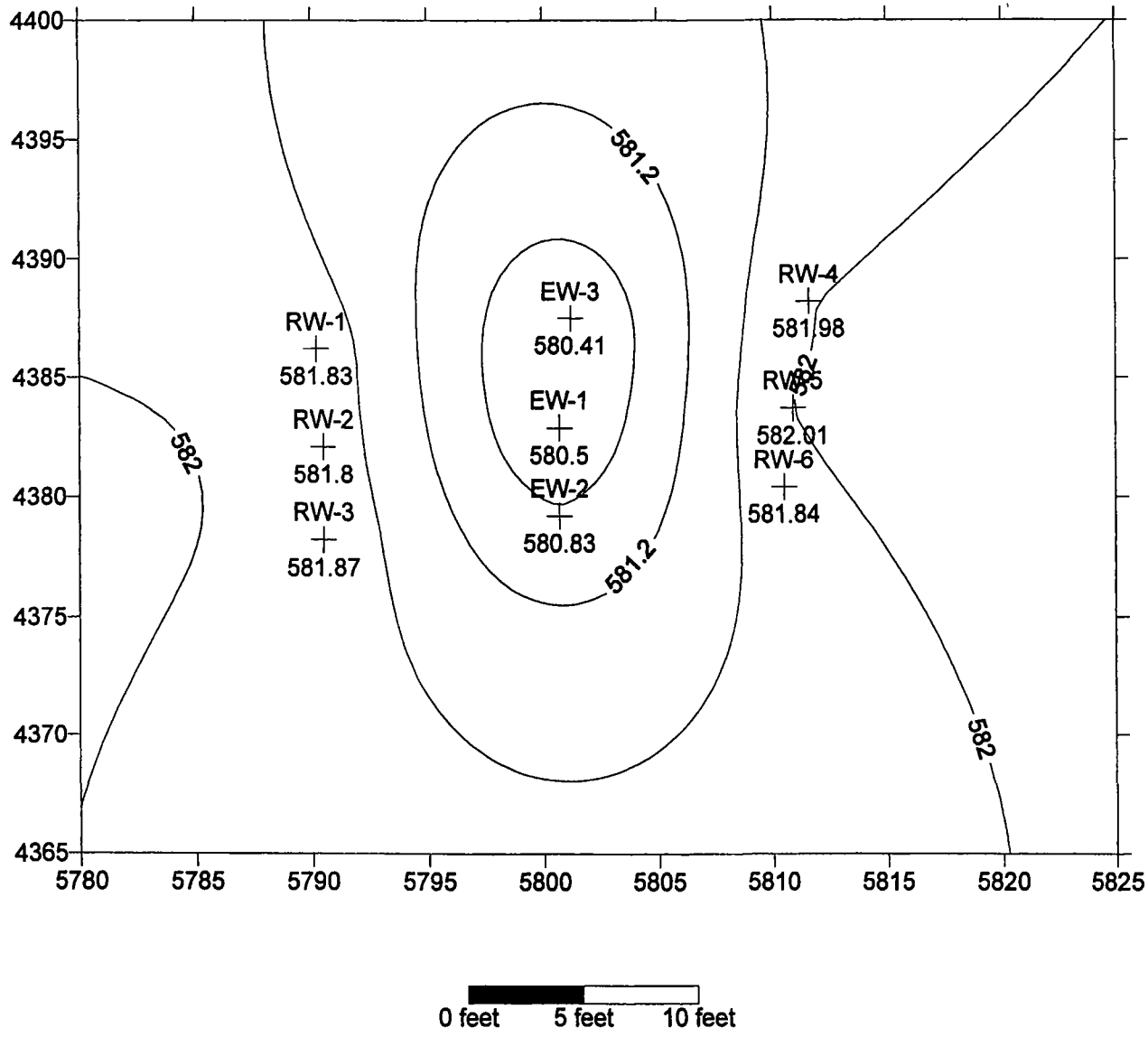
PLOT 5
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 12, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



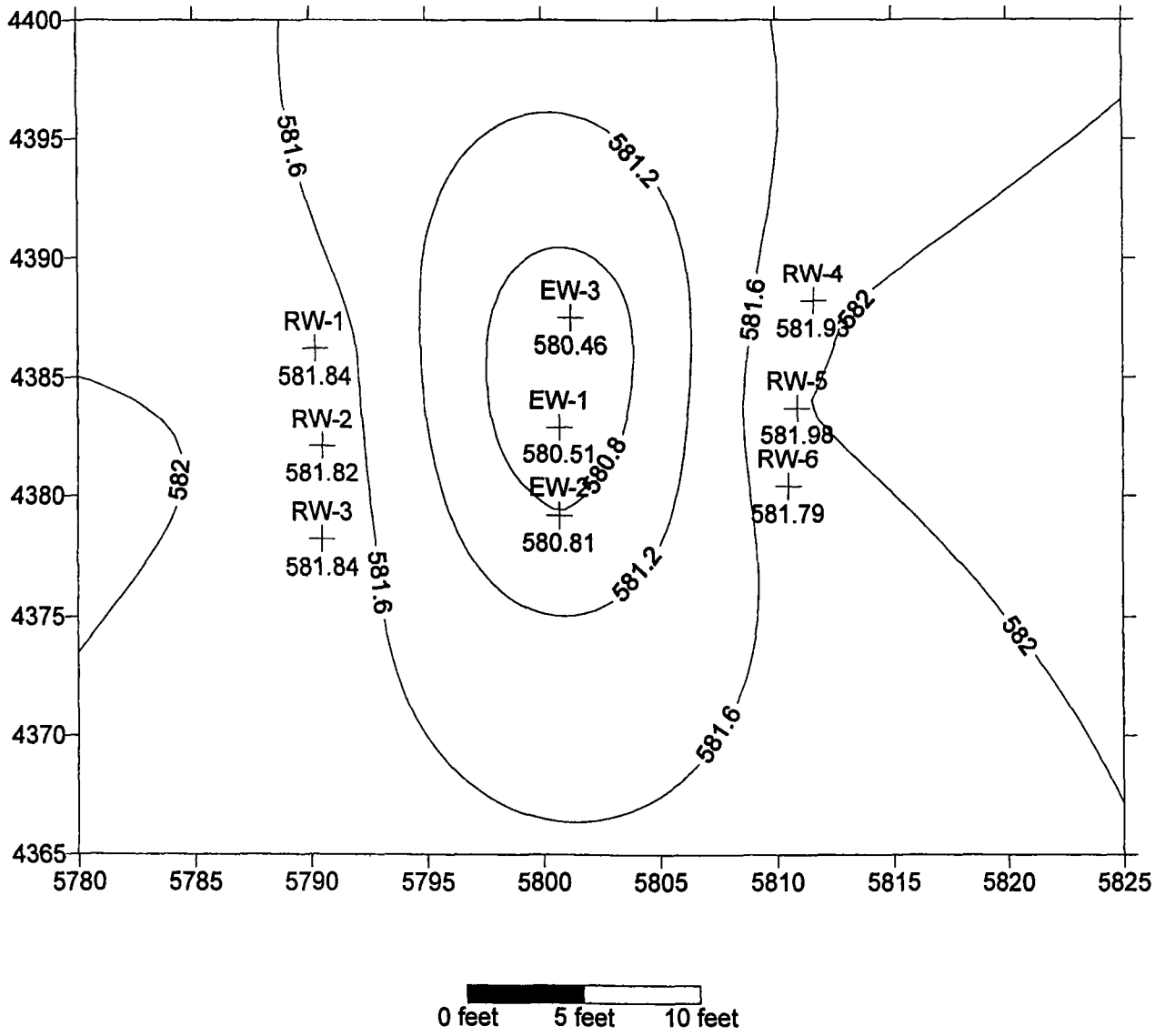
PLOT 6
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 13, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



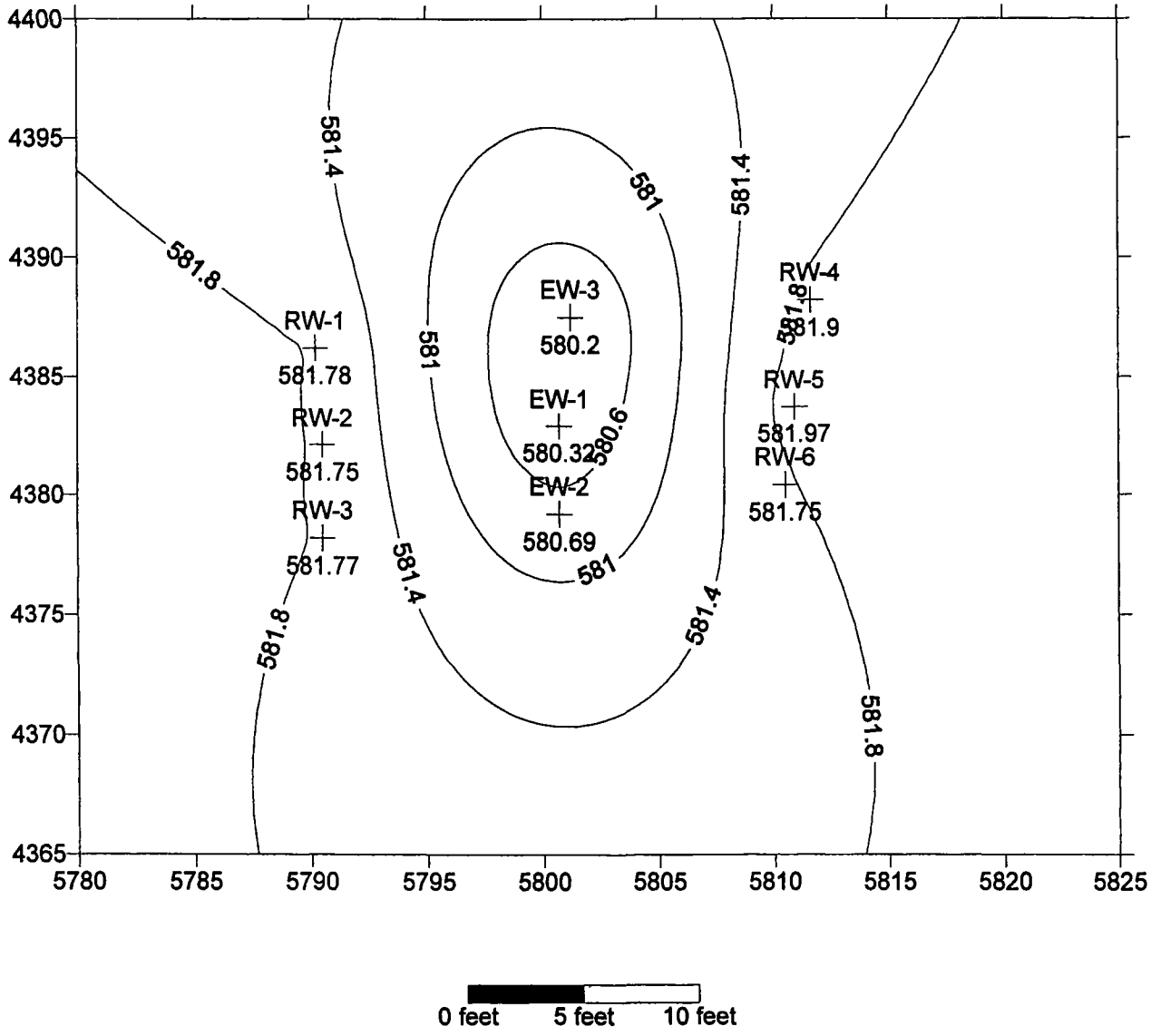
PLOT 7
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 14, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



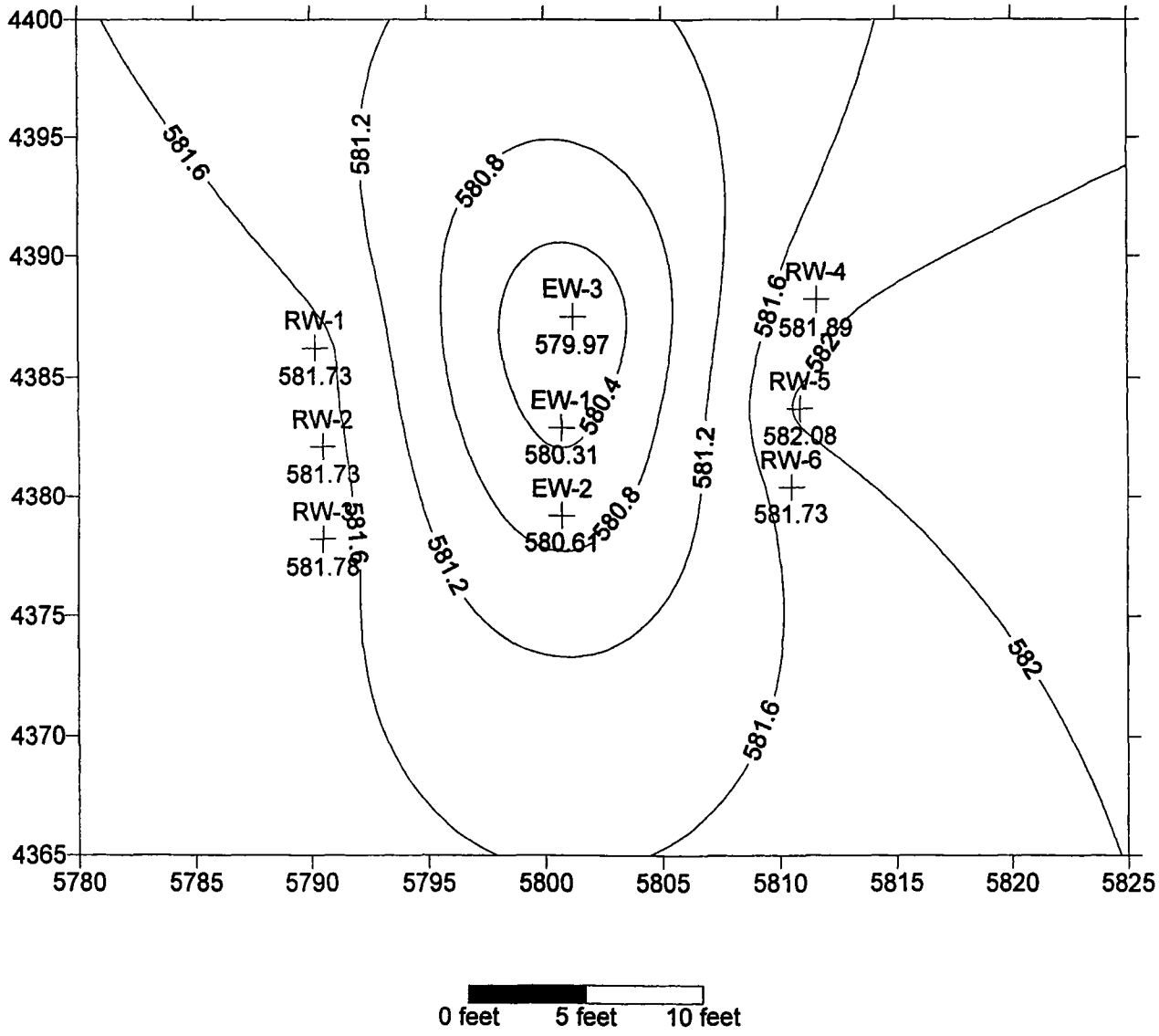
PLOT 8
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 15, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



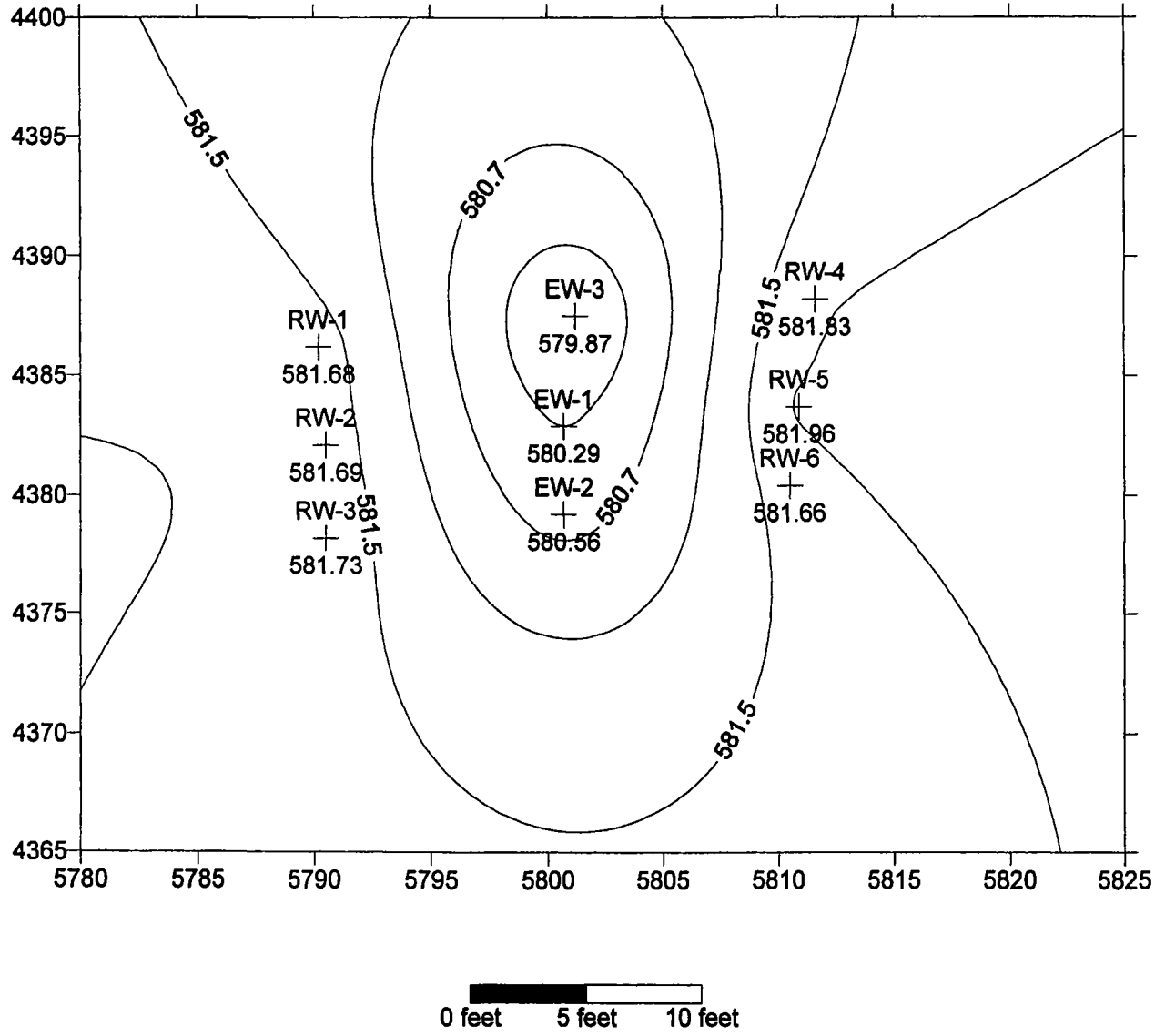
PLOT 9
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 16, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



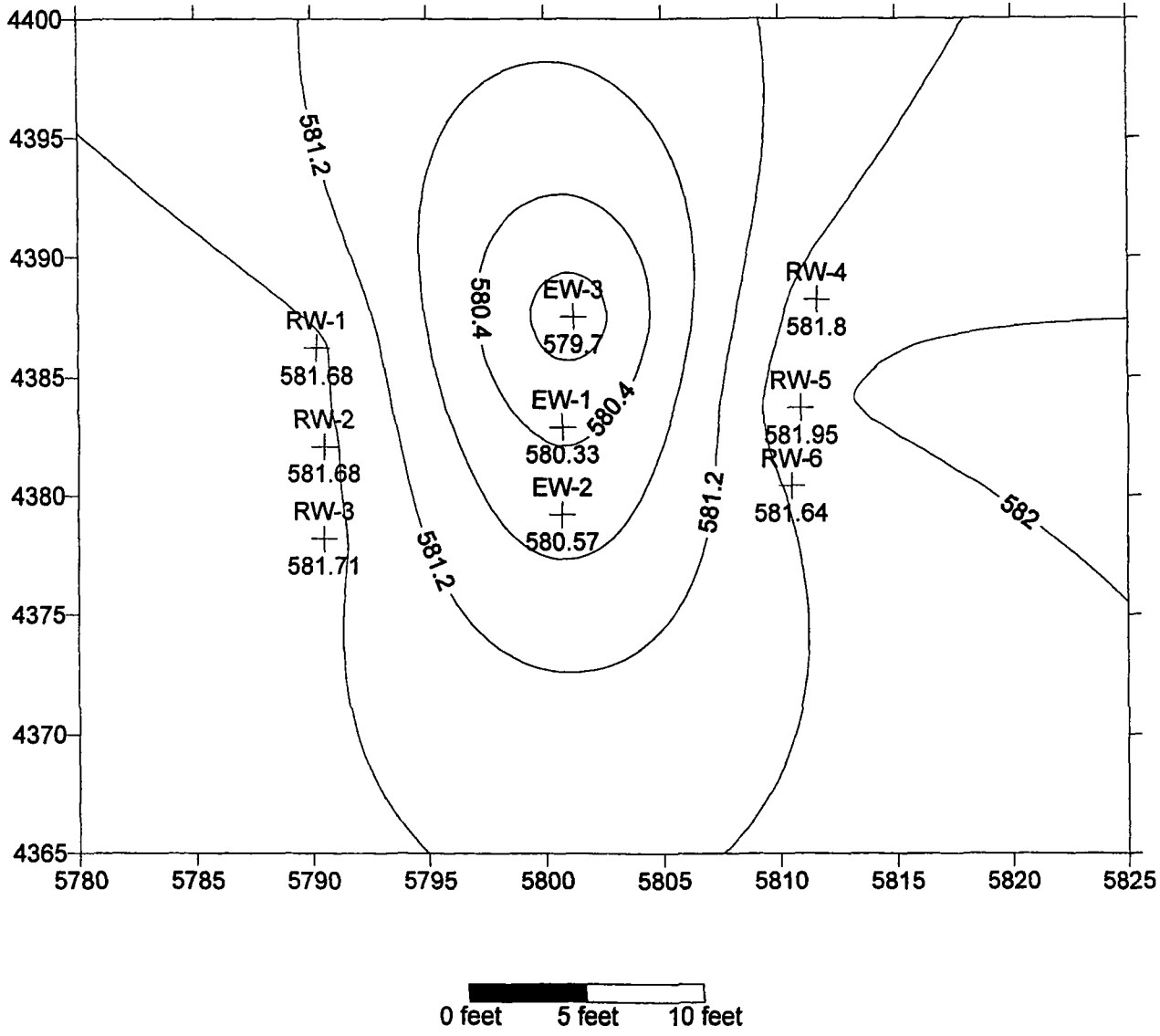
PLOT 10
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 17, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



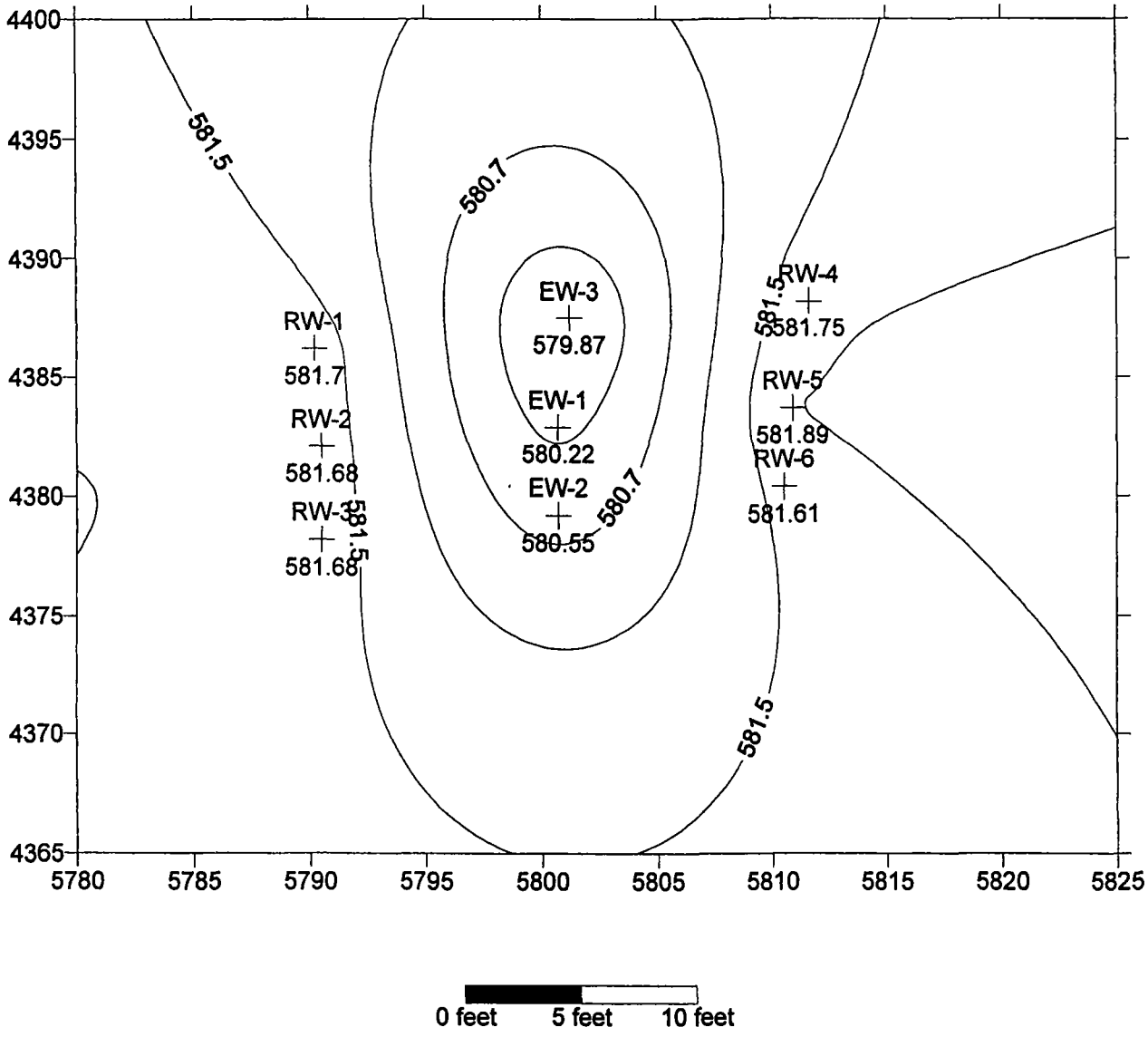
PLOT 11
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 18, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



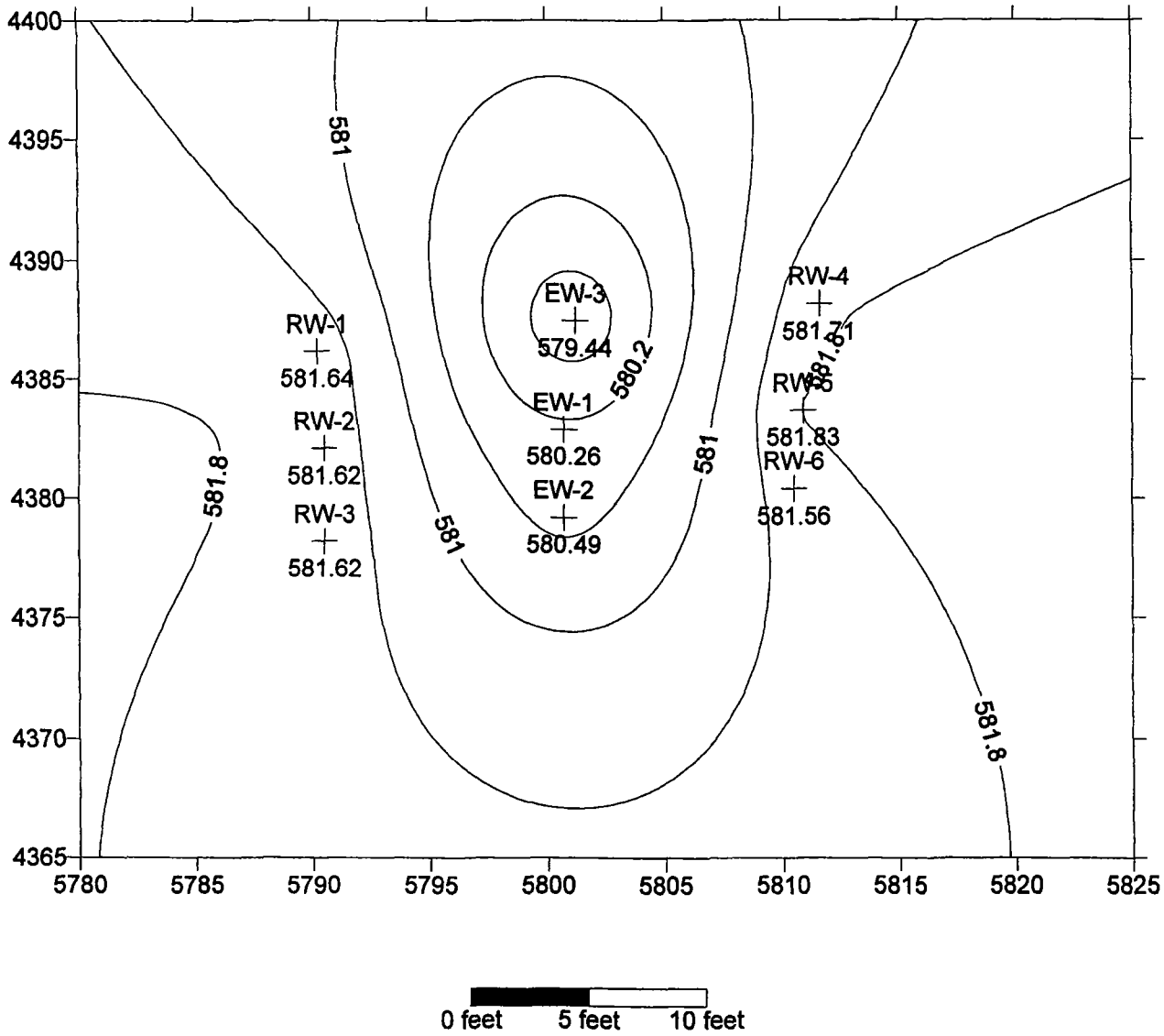
PLOT 12
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 19, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



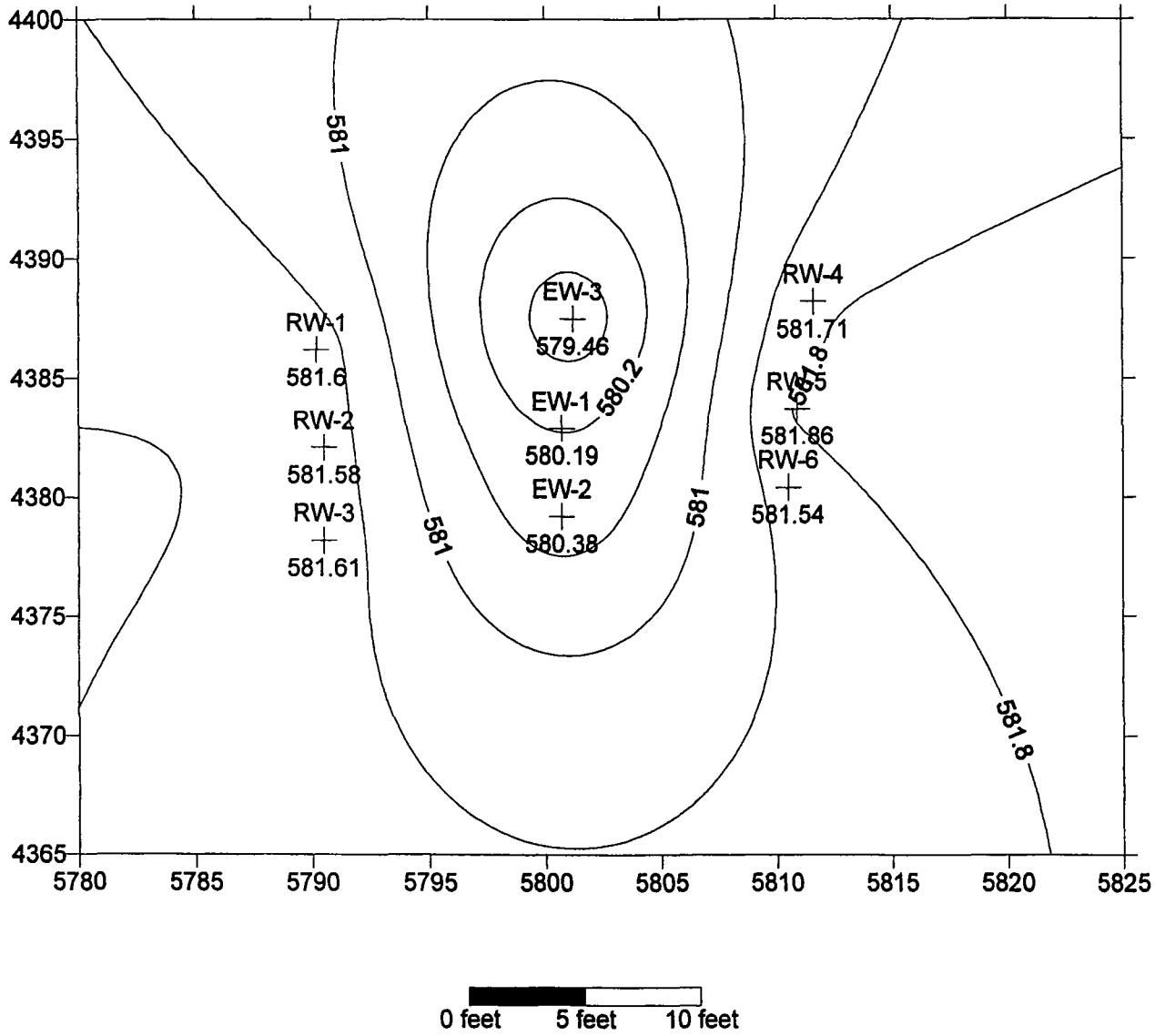
PLOT 13
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 20, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



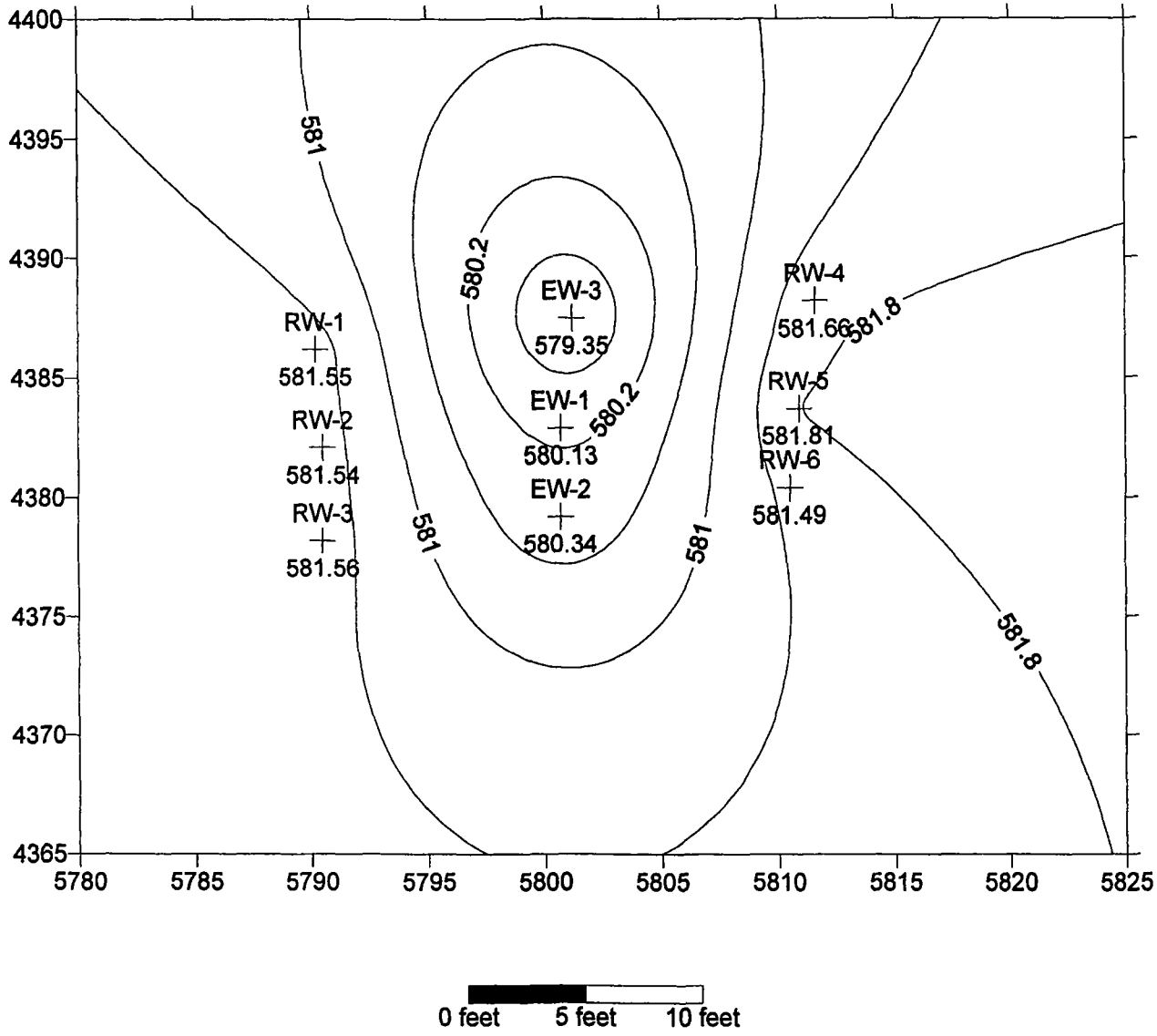
PLOT 14
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 21, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



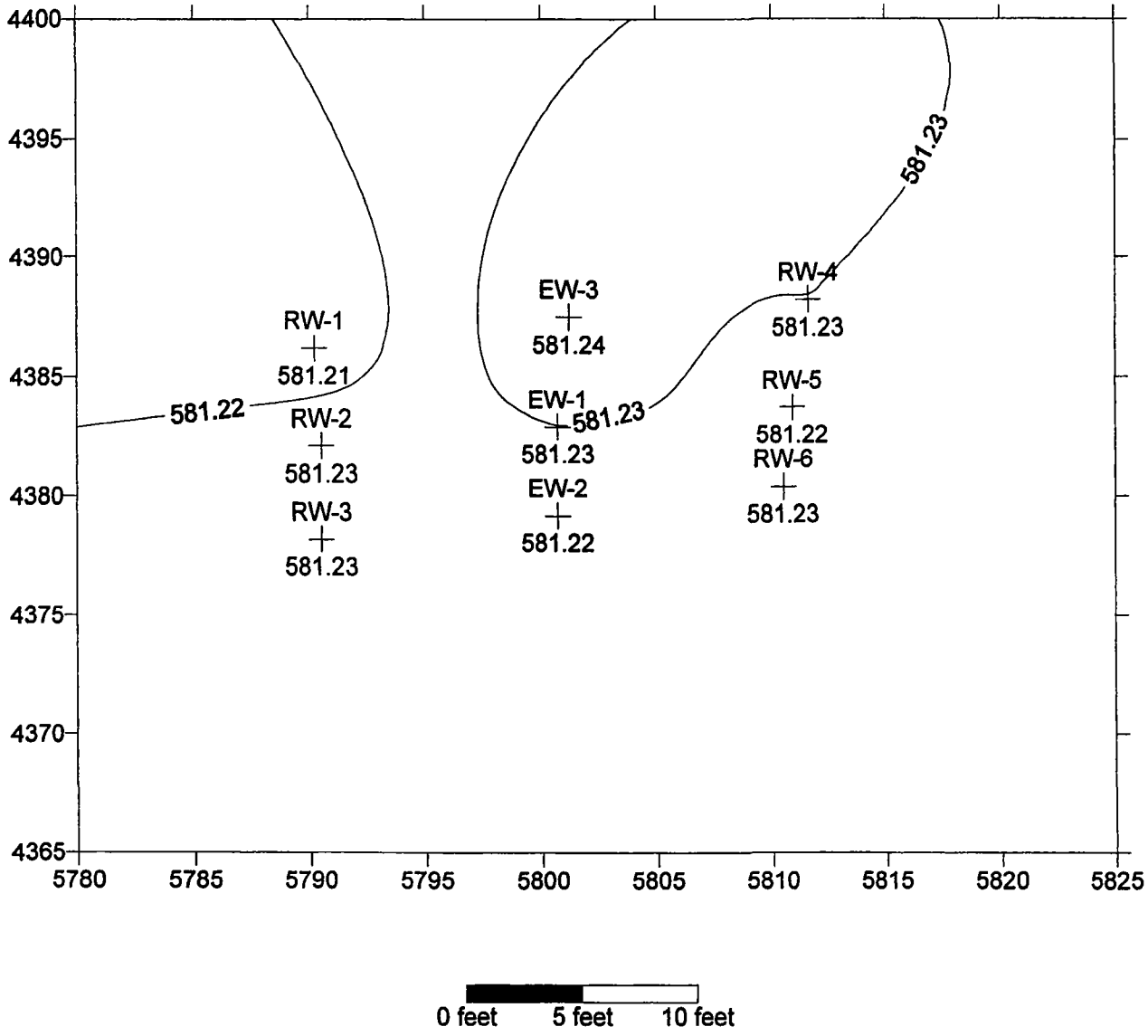
PLOT 15
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 22, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



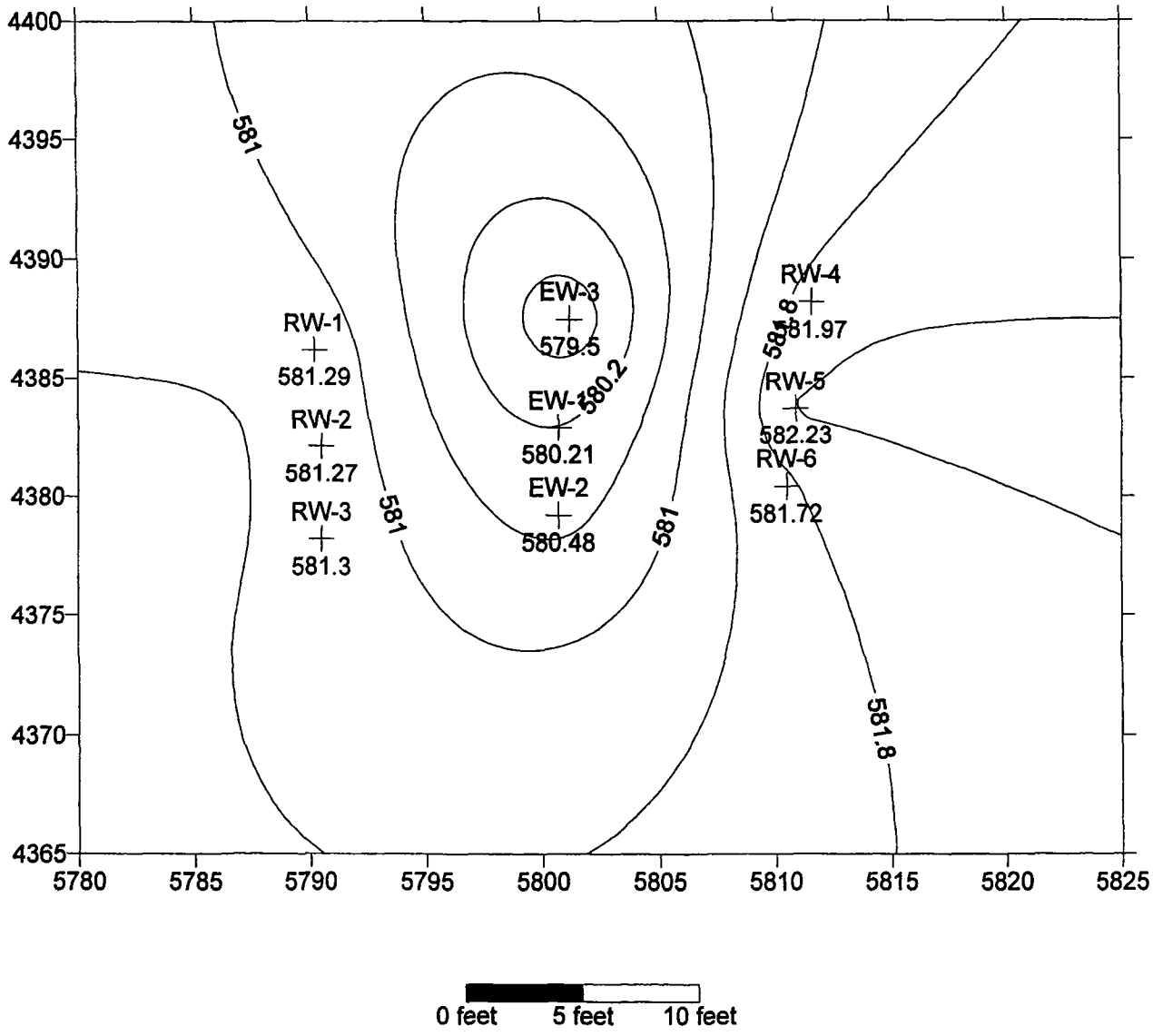
PLOT 16
PHASE 1 GROUNDWATER CONTOURS- OCTOBER 23, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



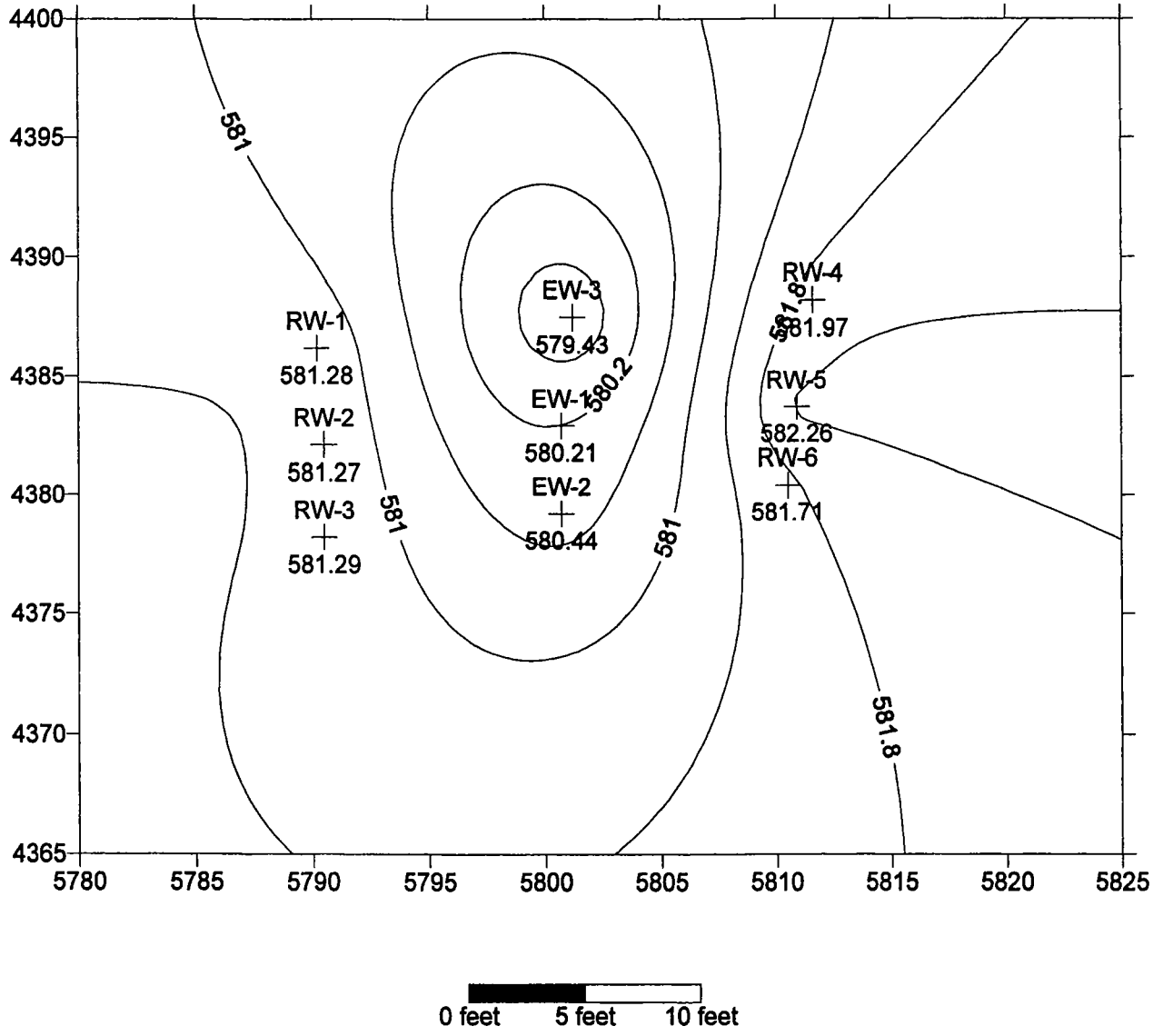
PLOT 17
OCTOBER 24, 2000 - SHUTDOWN BETWEEN PHASE 1 AND 2
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



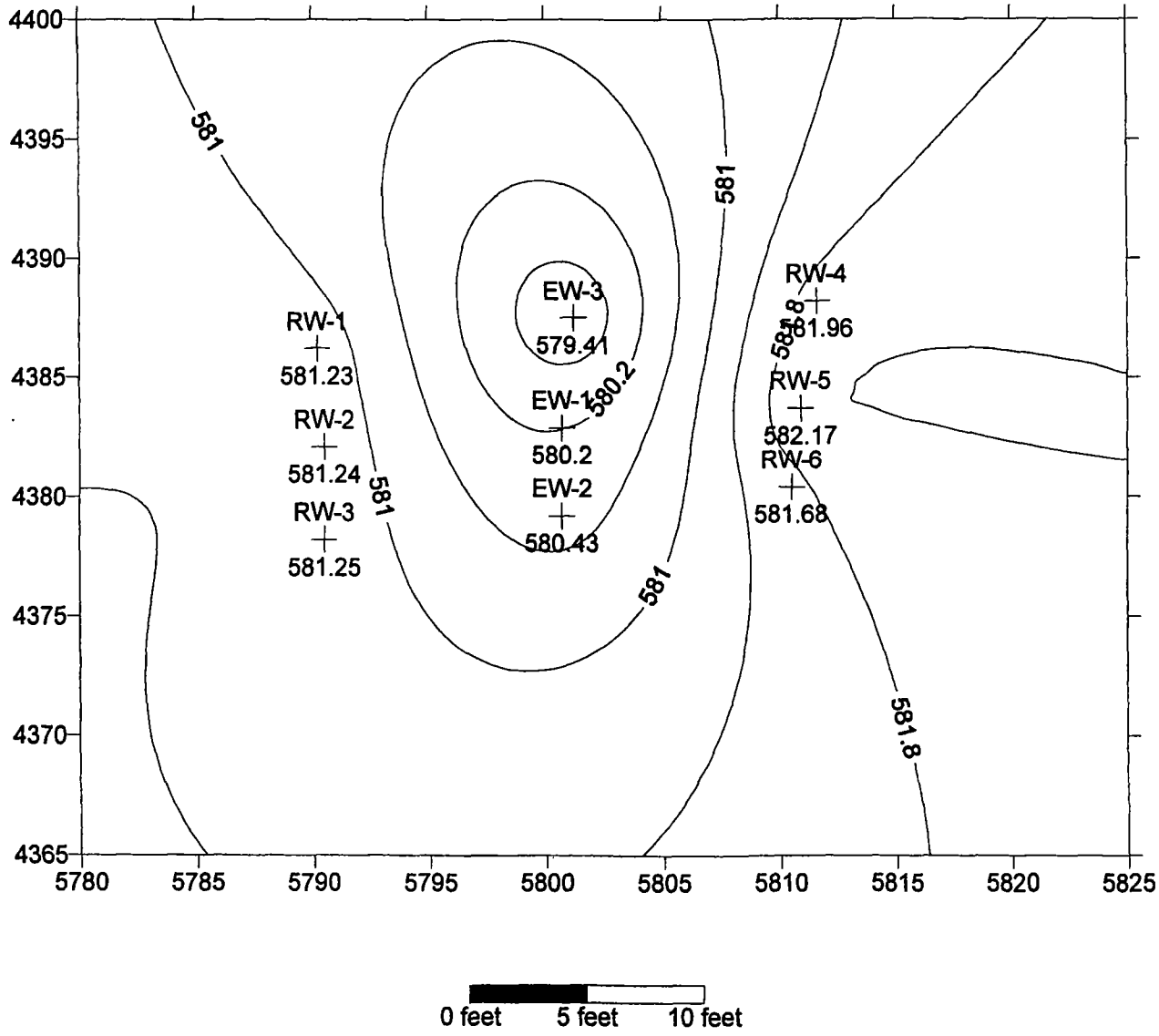
PLOT 18
PHASE 2 GROUNDWATER CONTOURS- OCTOBER 25, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



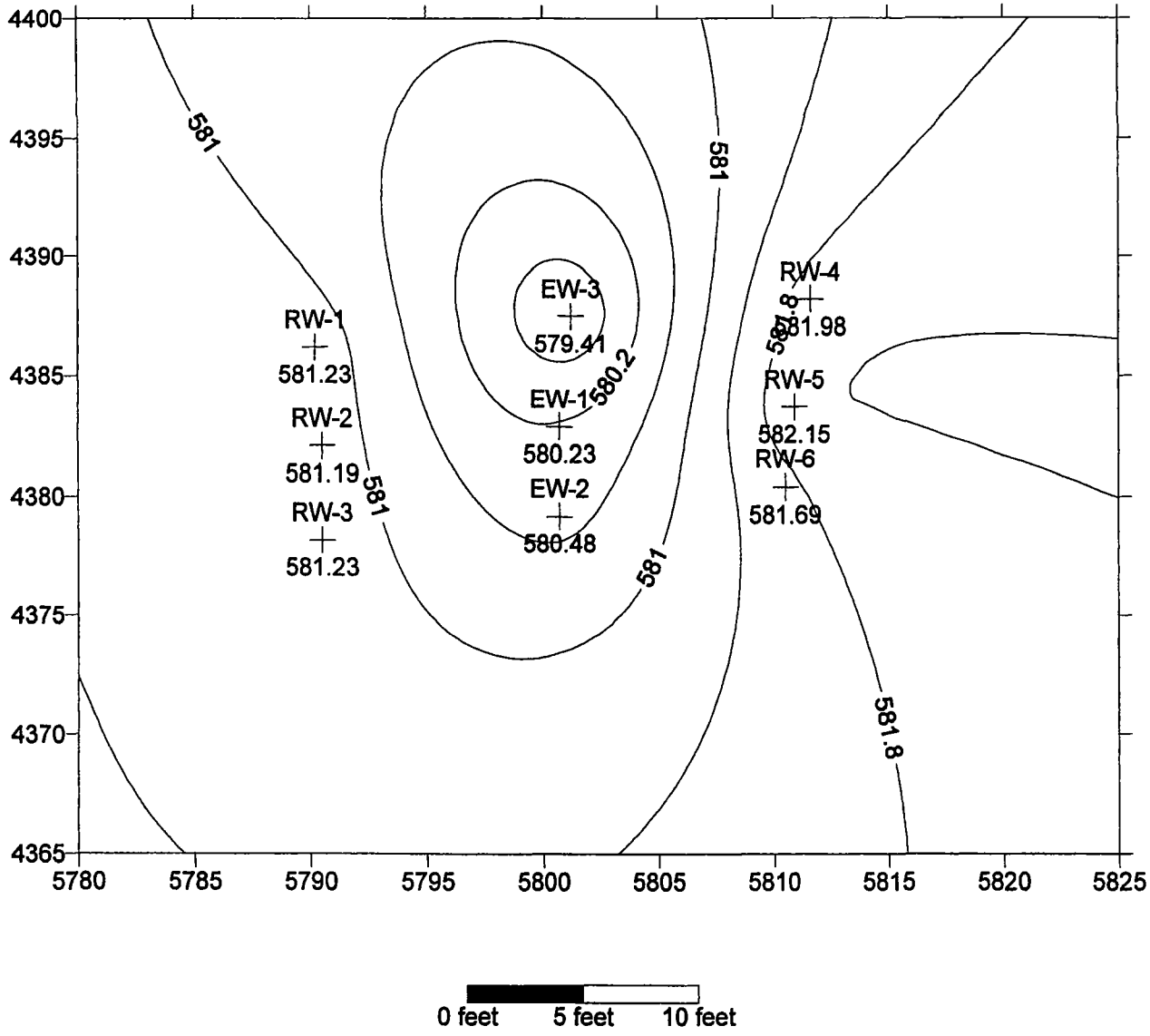
PLOT 19
PHASE 2 GROUNDWATER CONTOURS- OCTOBER 26, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



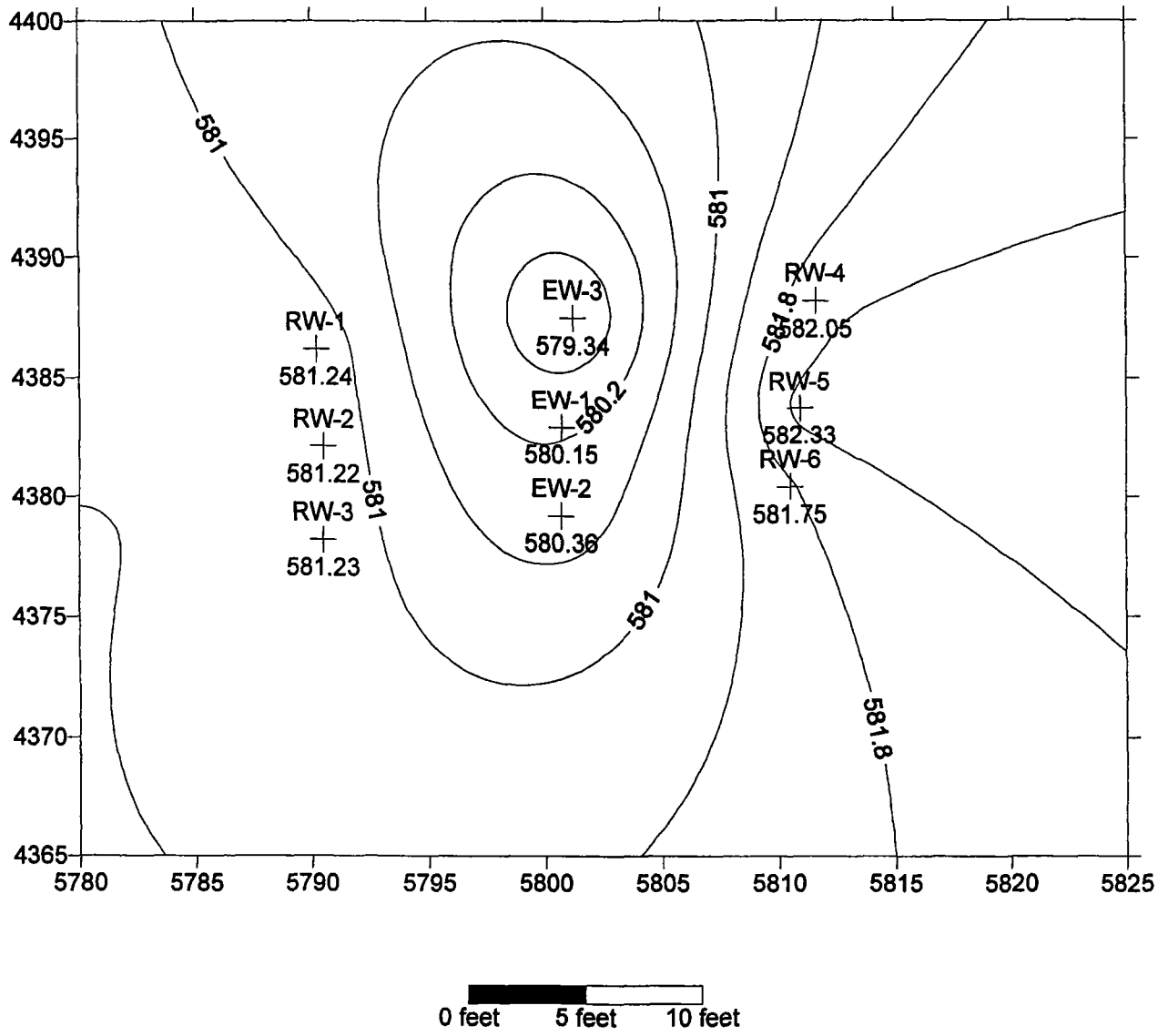
PLOT 20
PHASE 2 GROUNDWATER CONTOURS- OCTOBER 27, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



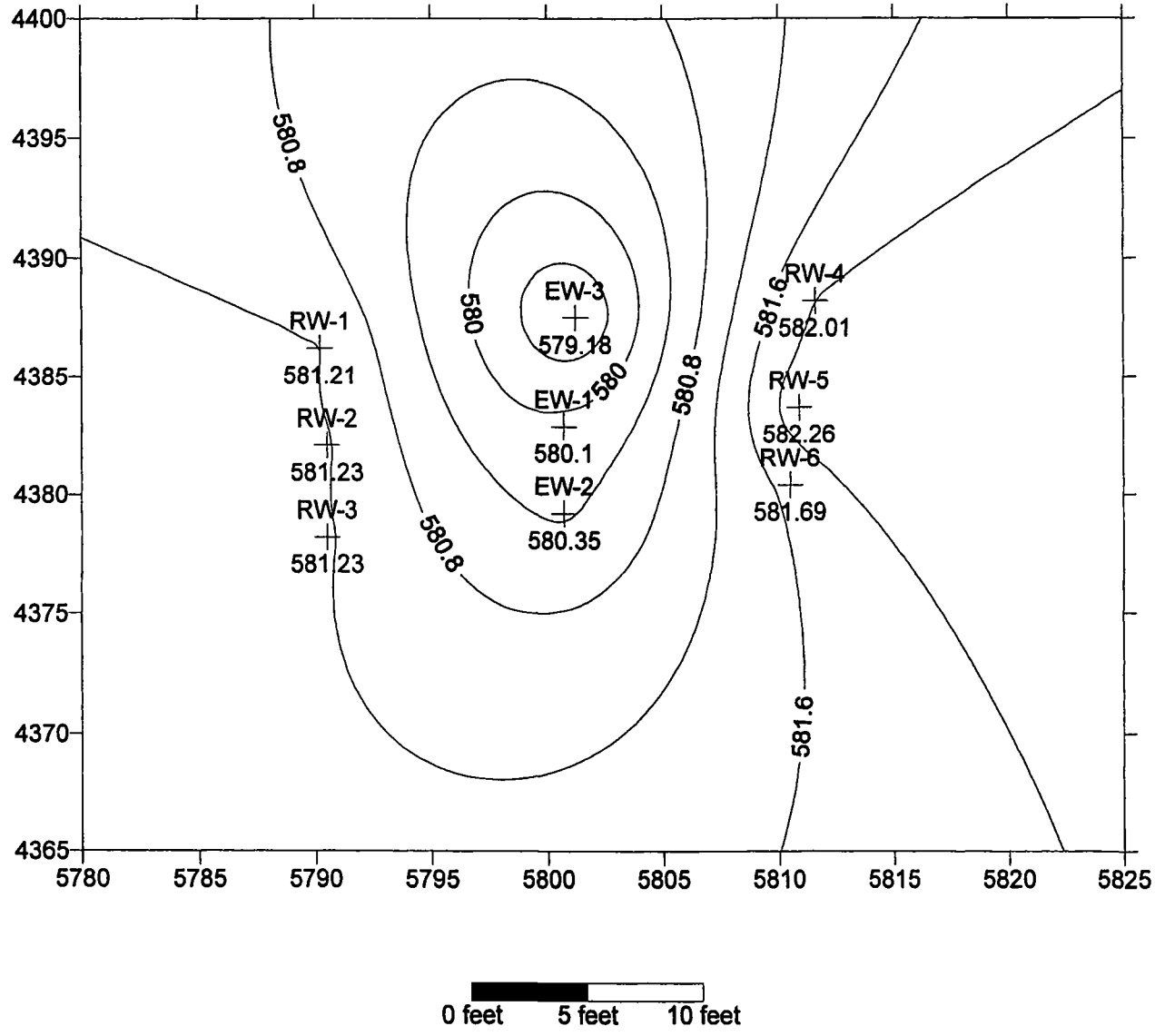
PLOT 21
PHASE 2 GROUNDWATER CONTOURS- OCTOBER 28, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



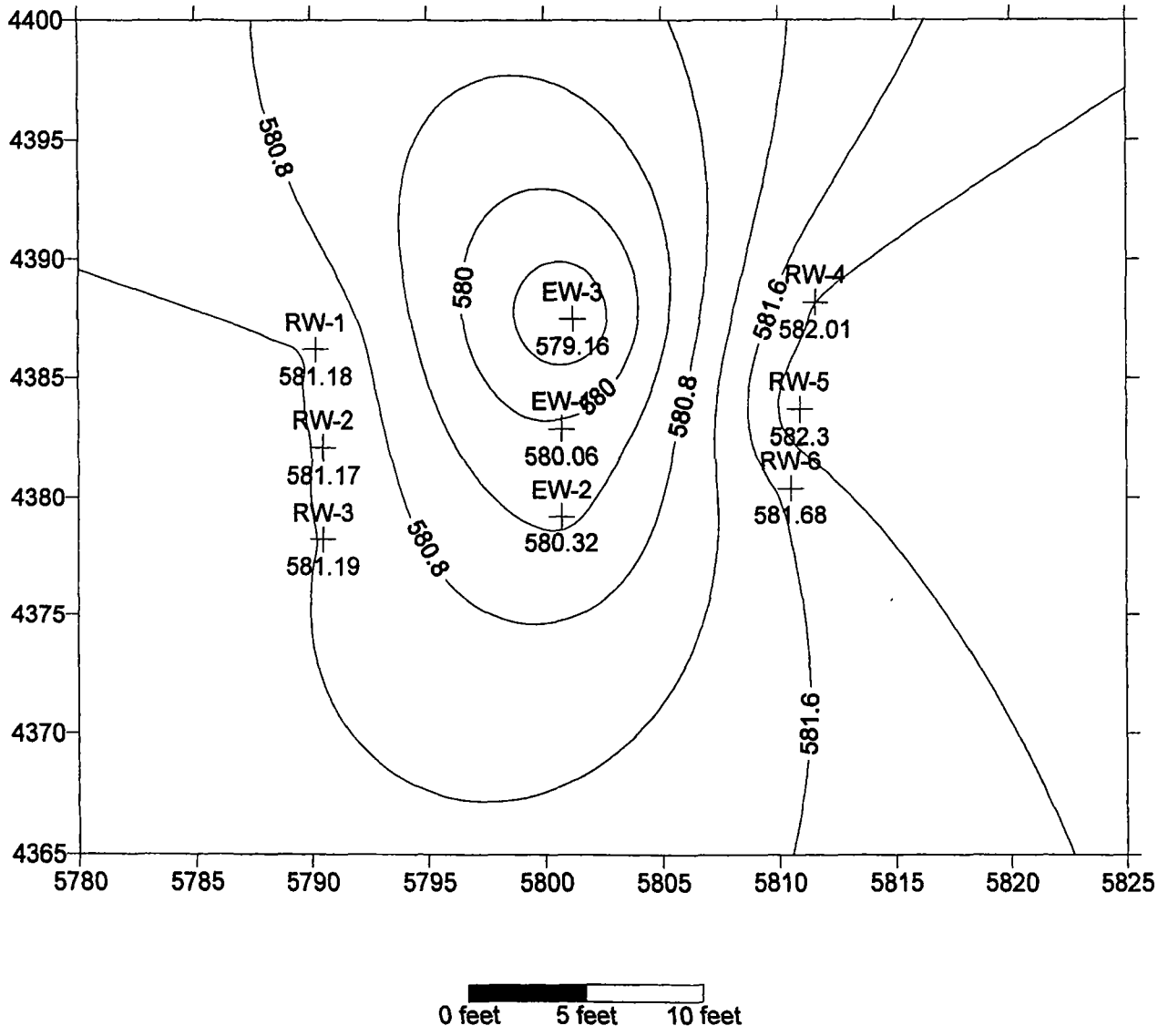
PLOT 22
PHASE 2 GROUNDWATER CONTOURS- OCTOBER 29, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



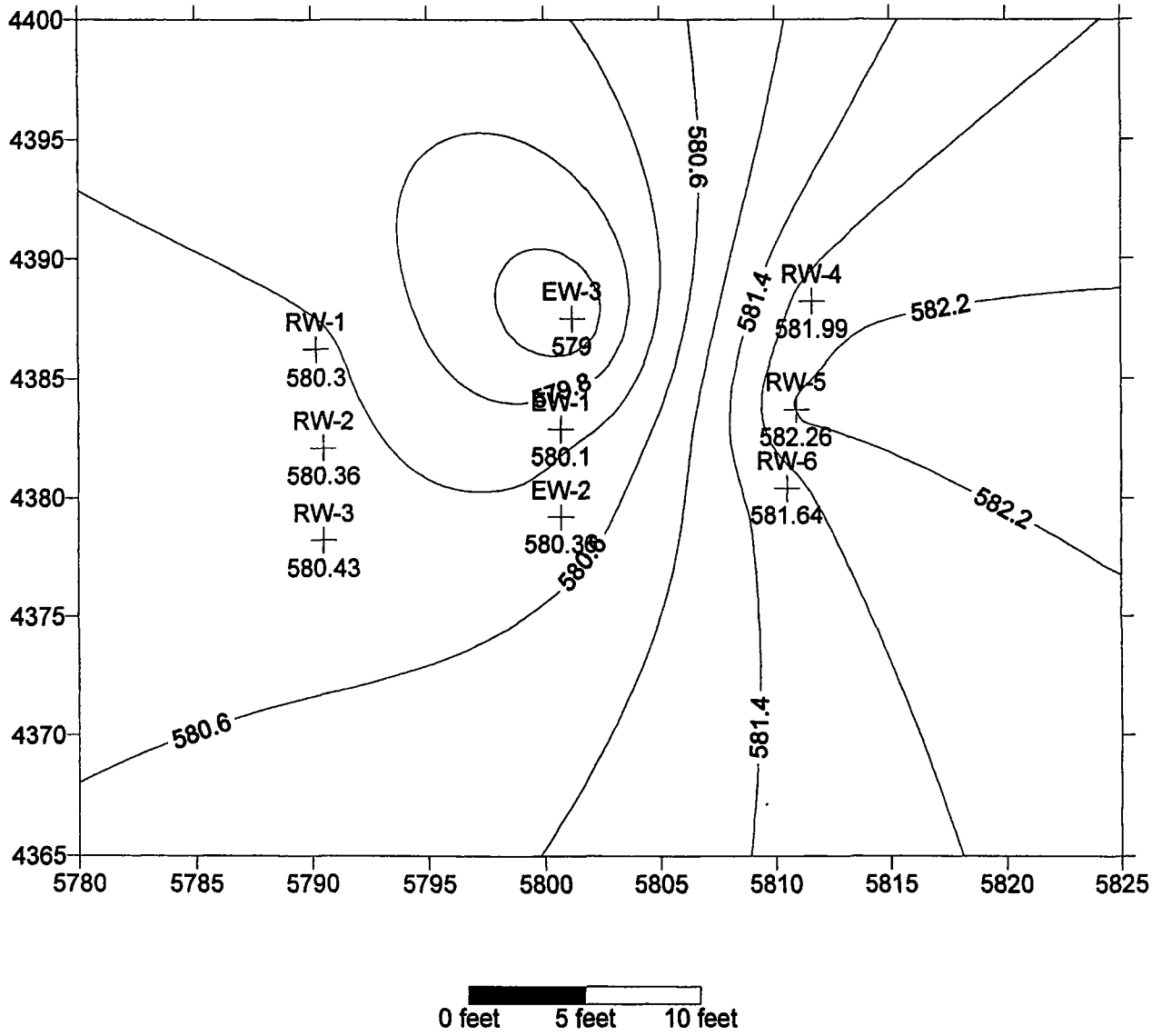
PLOT 23
PHASE 2 GROUNDWATER CONTOURS- OCTOBER 30, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



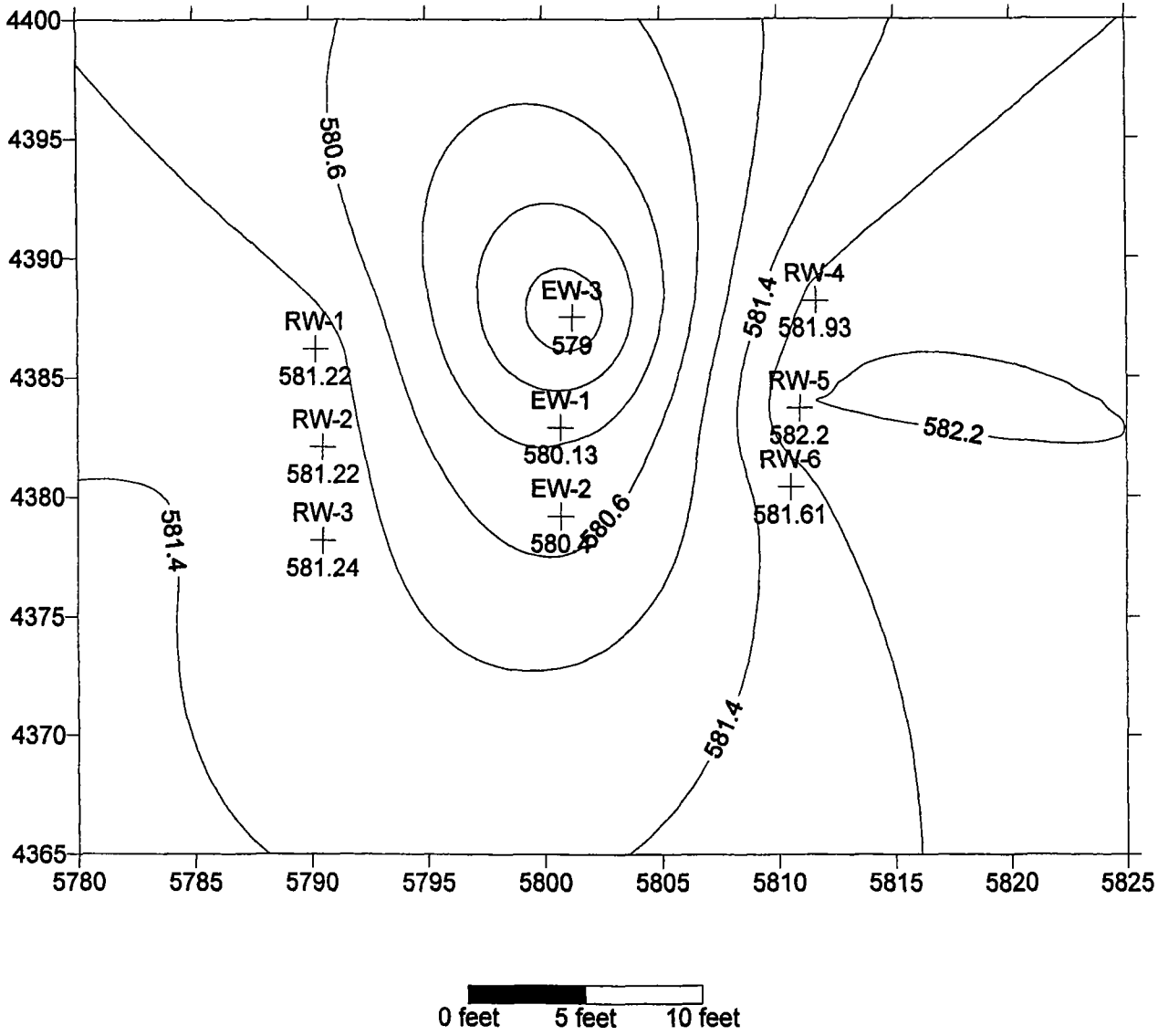
PLOT 24
PHASE 2 GROUNDWATER CONTOURS- OCTOBER 31, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



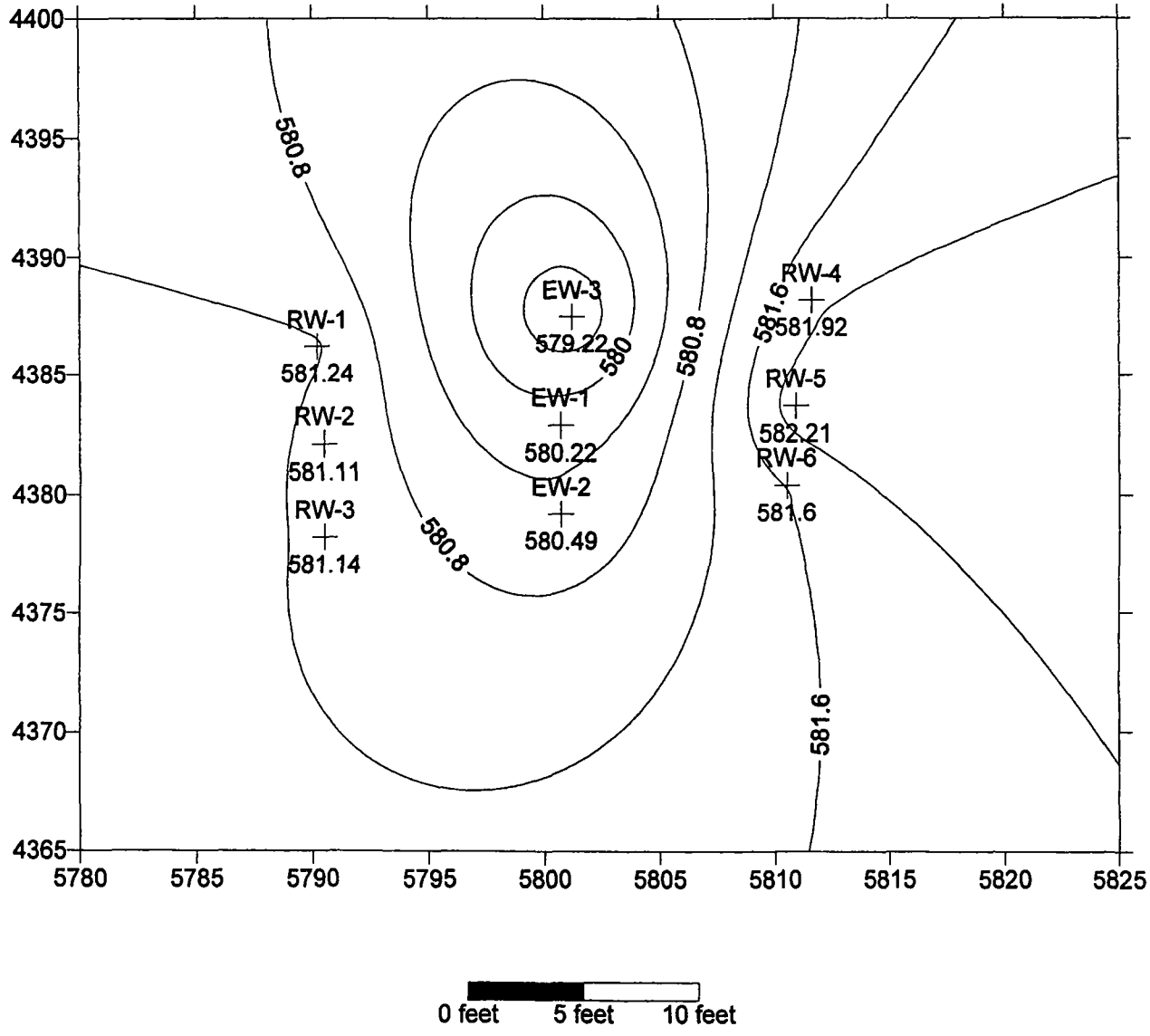
PLOT 25
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 1, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



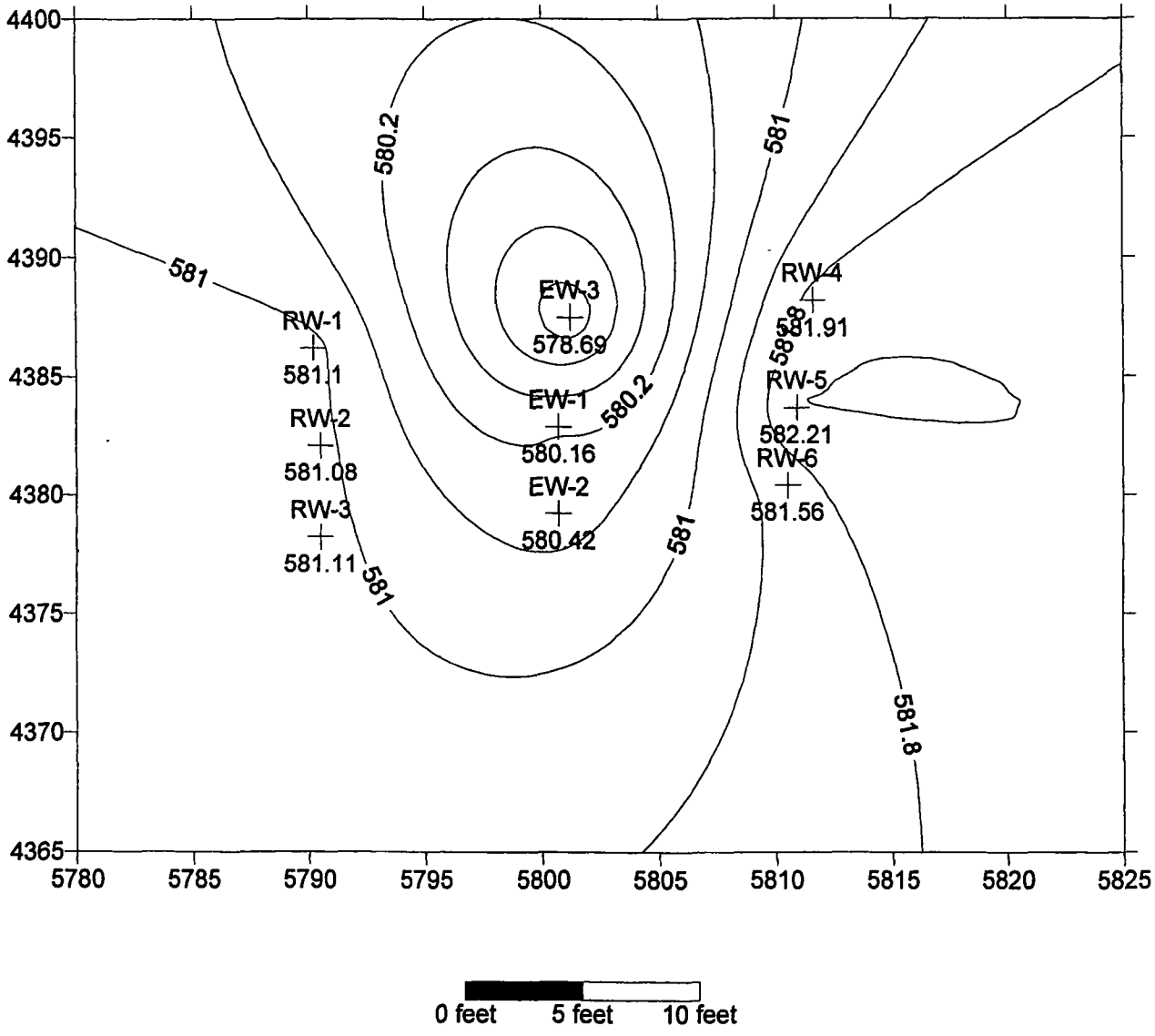
PLOT 26
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 2, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



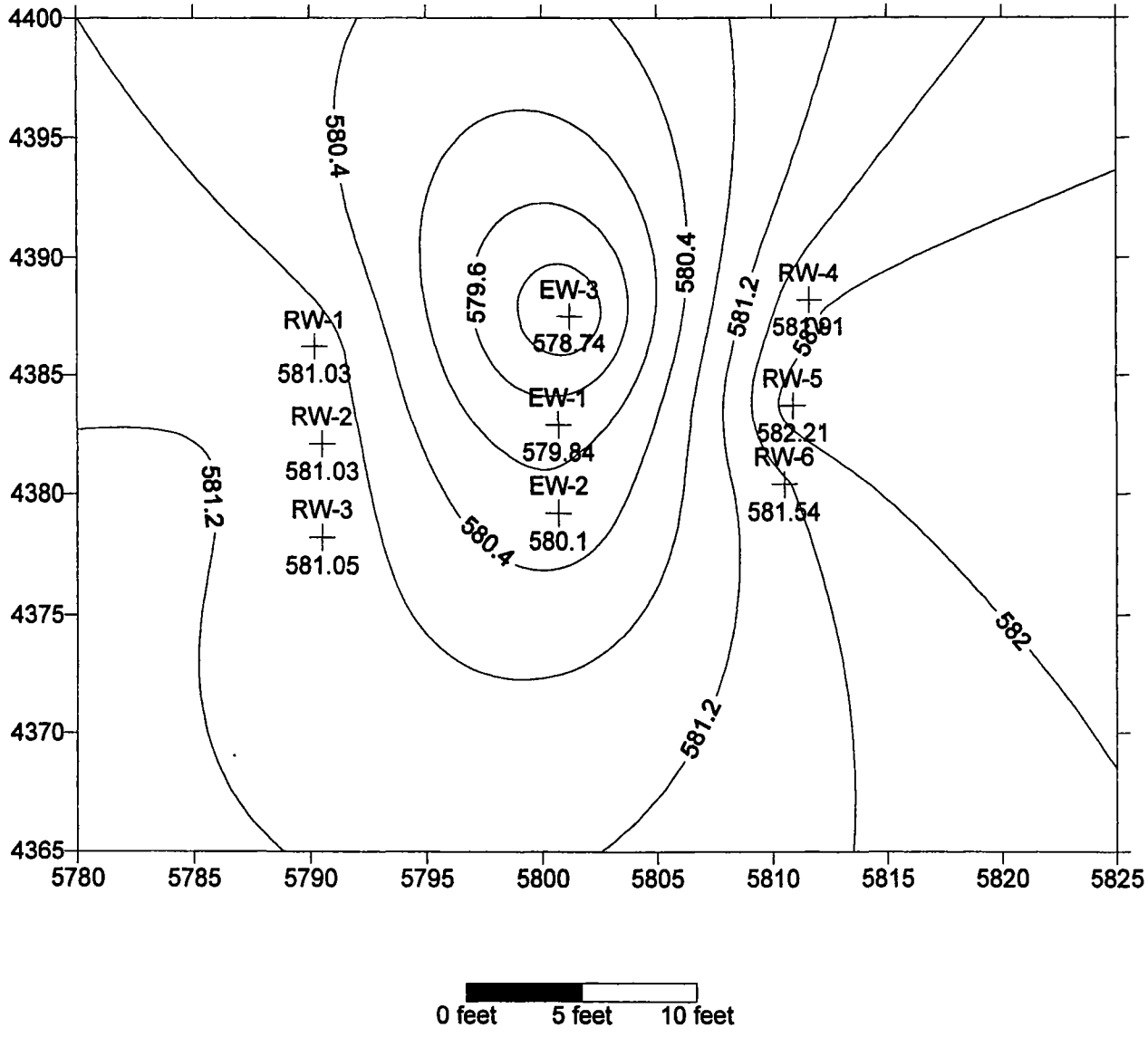
PLOT 27
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 3, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



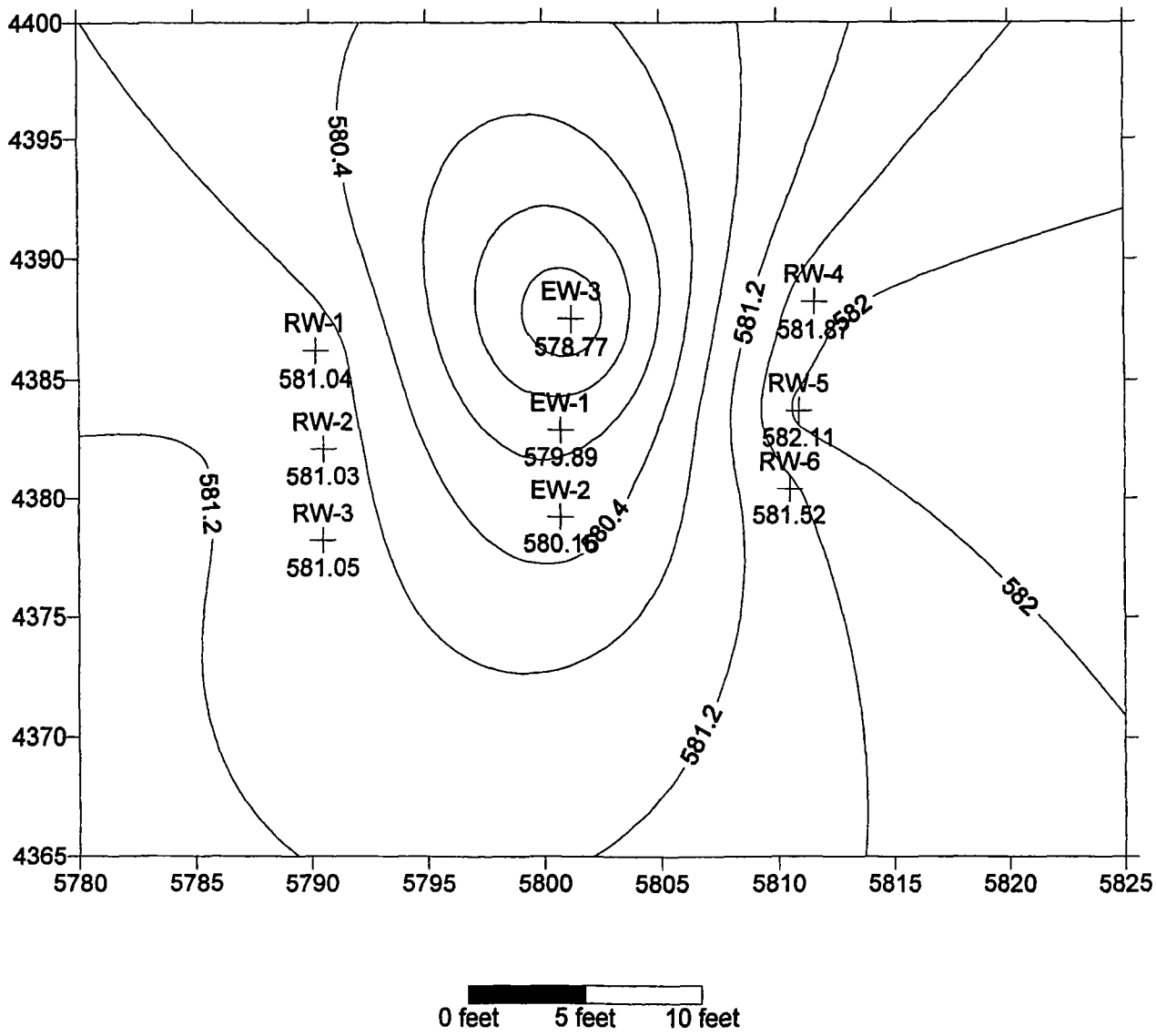
PLOT 28
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 4, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



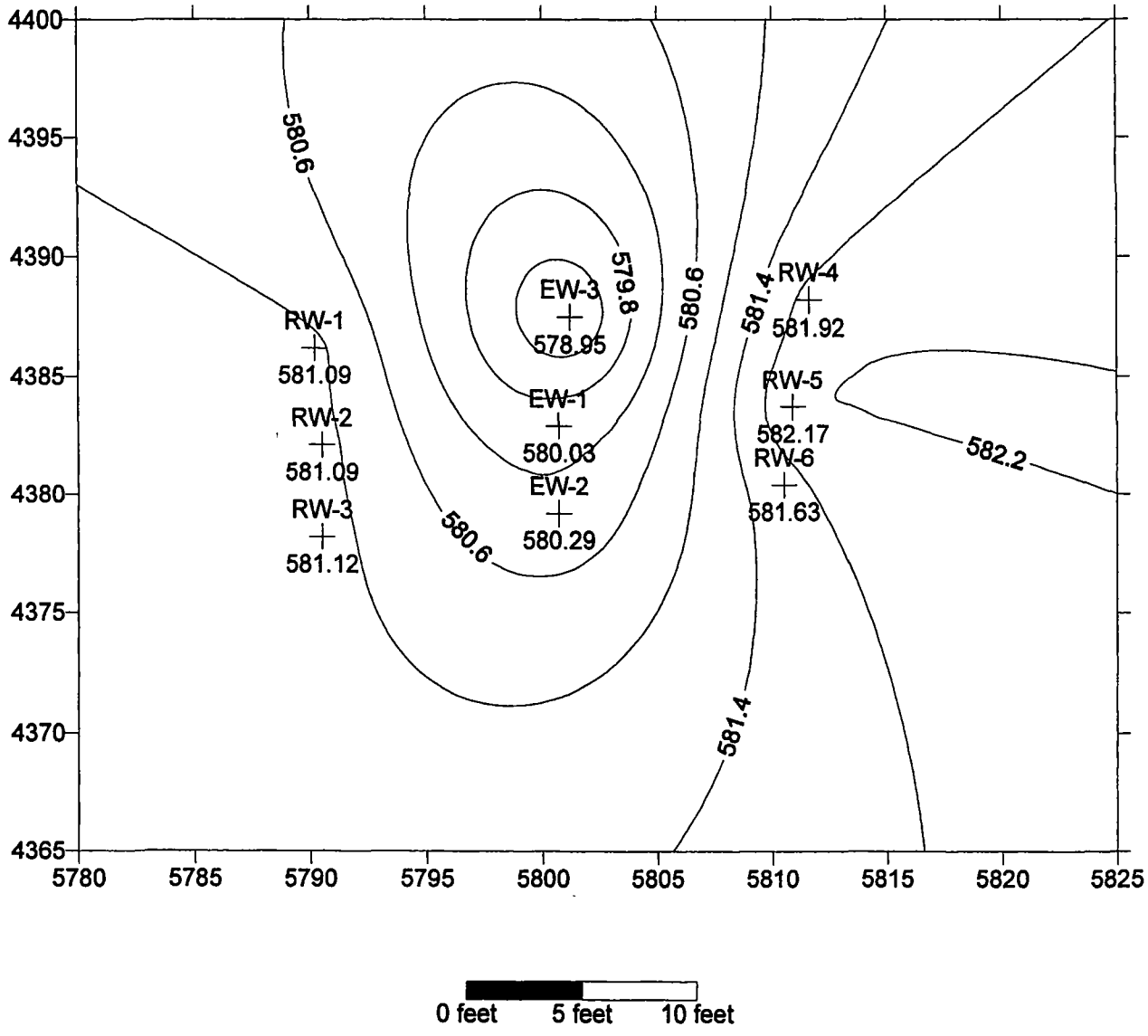
PLOT 29
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 5, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



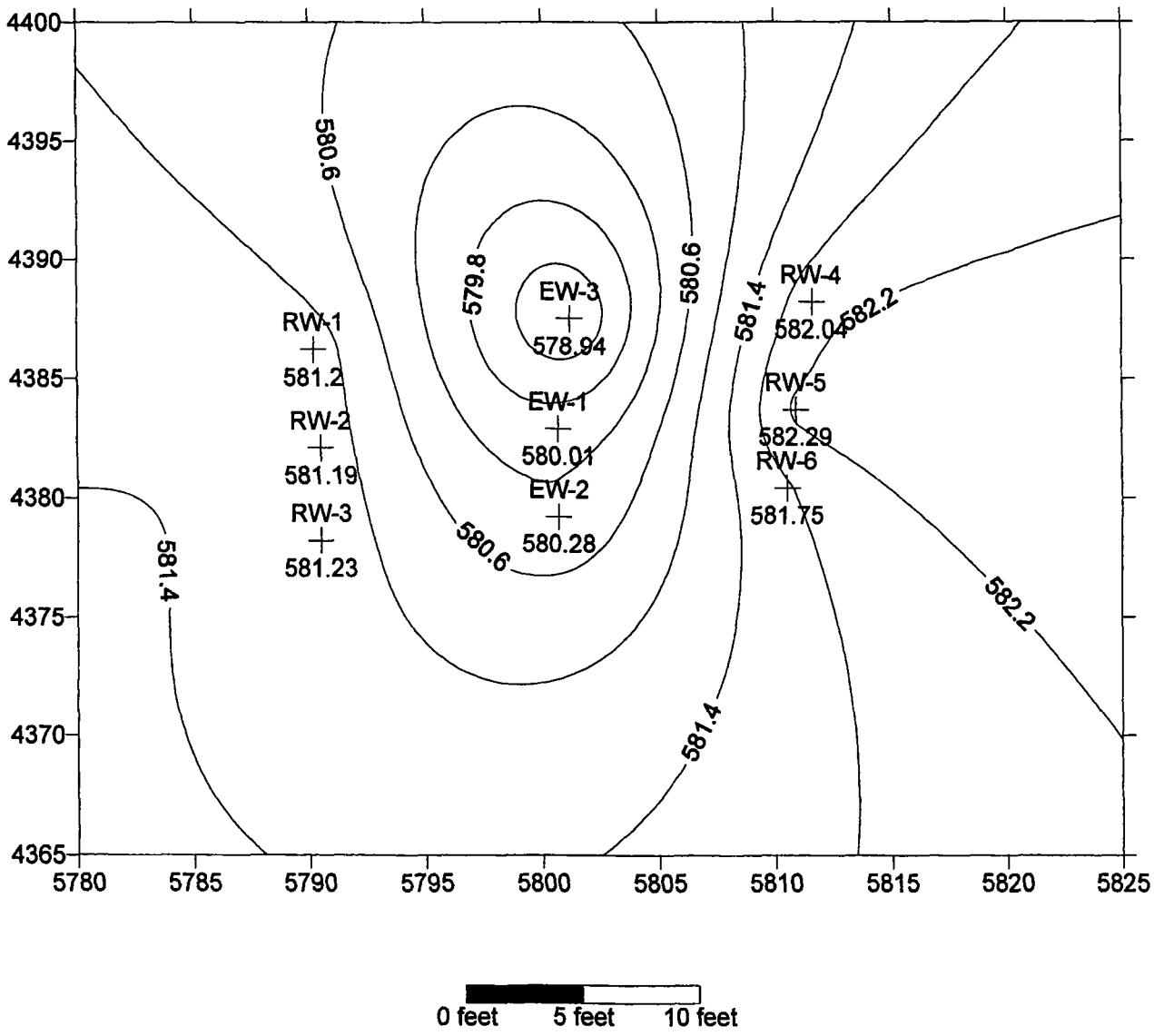
PLOT 30
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 6, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



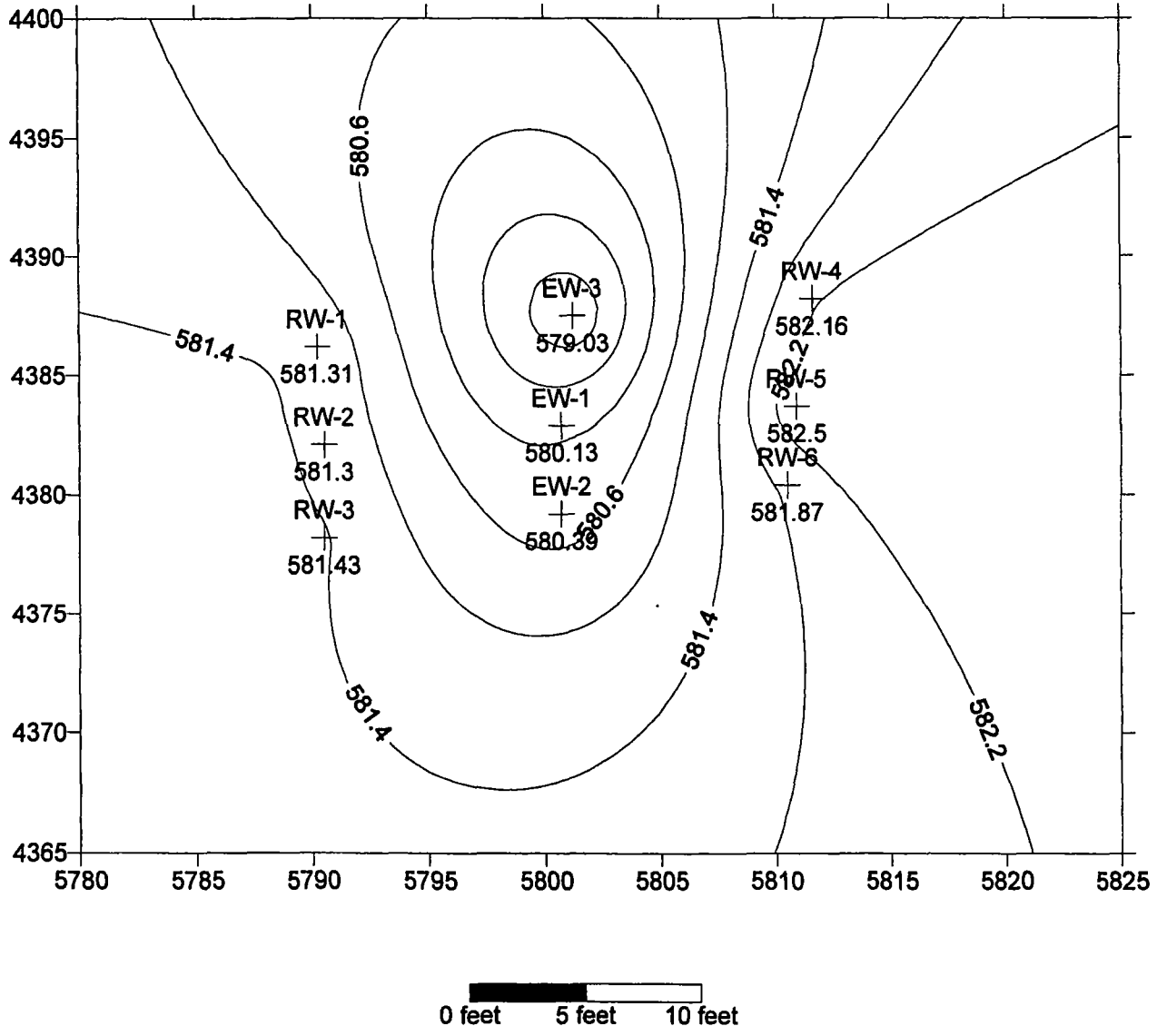
PLOT 31
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 7, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



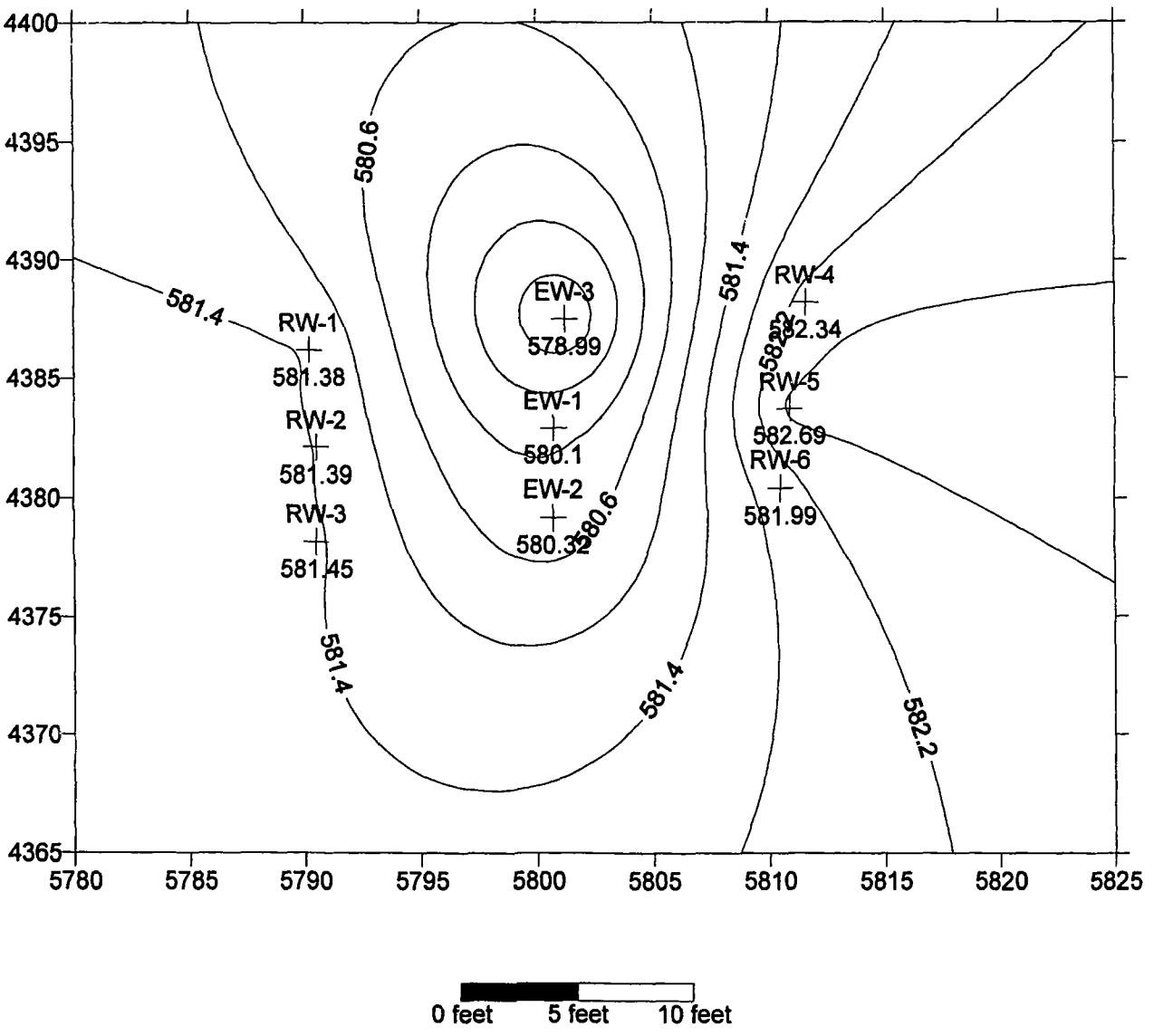
PLOT 32
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 8, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



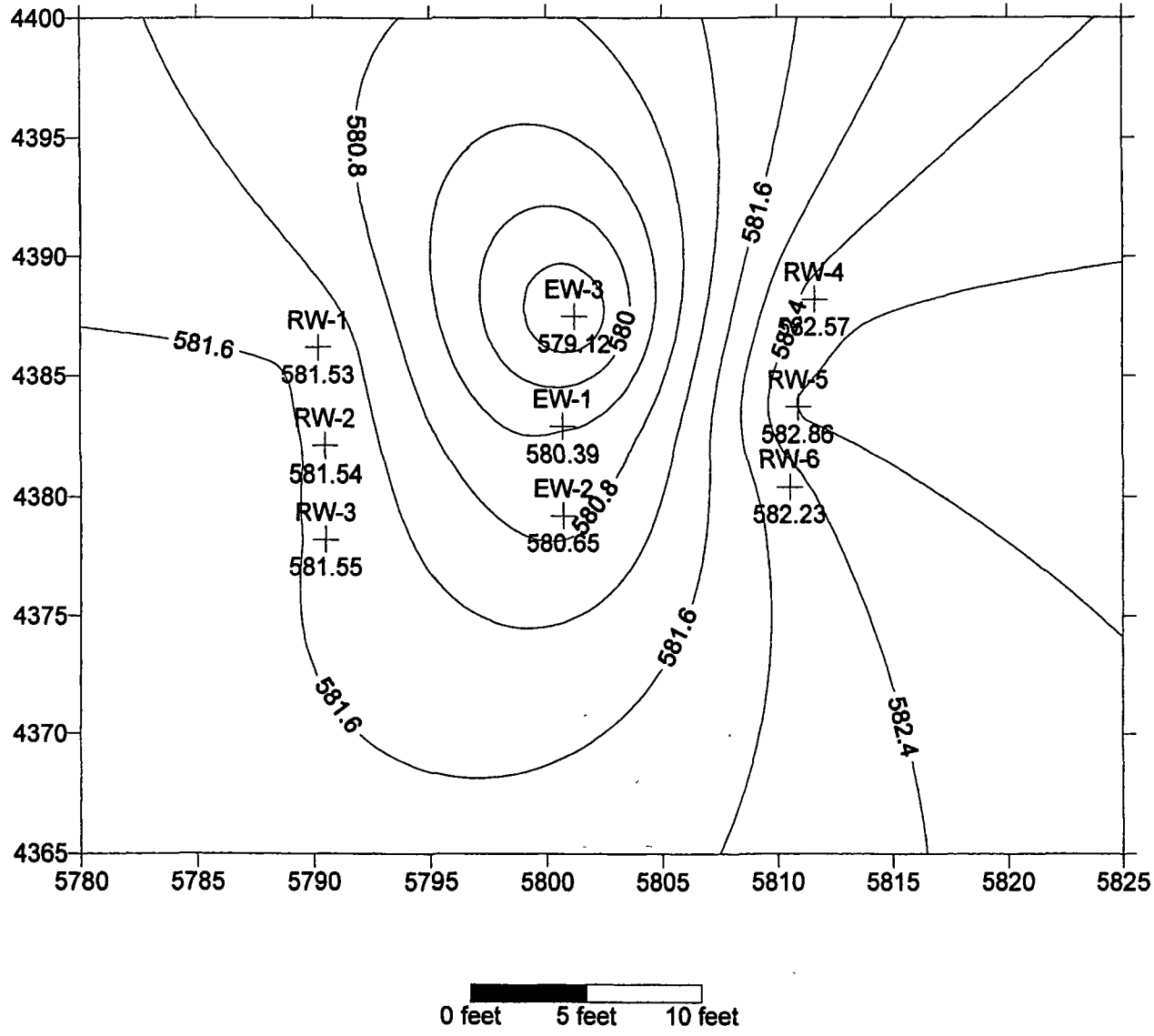
PLOT 33
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 9, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



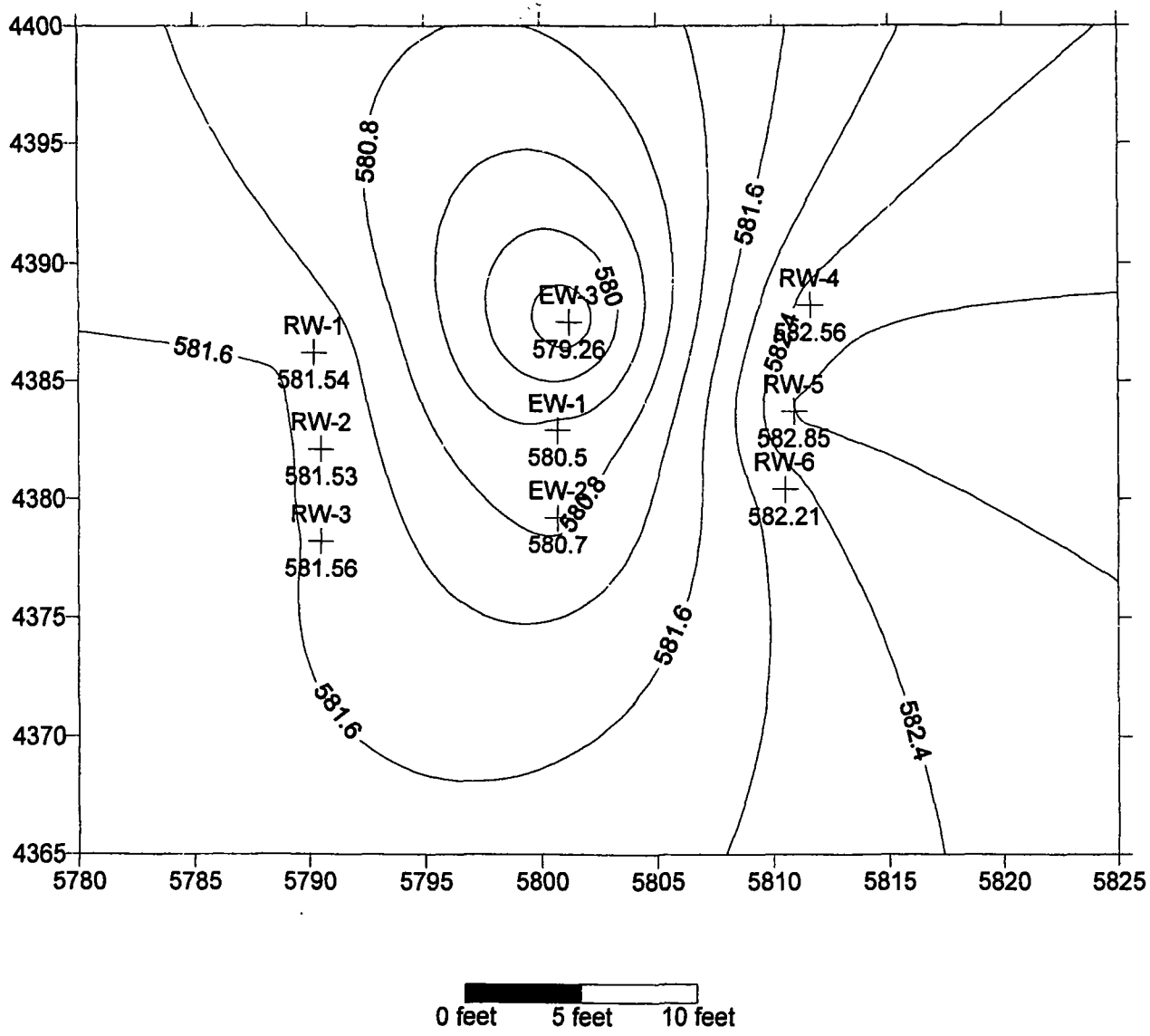
PLOT 34
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 10, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



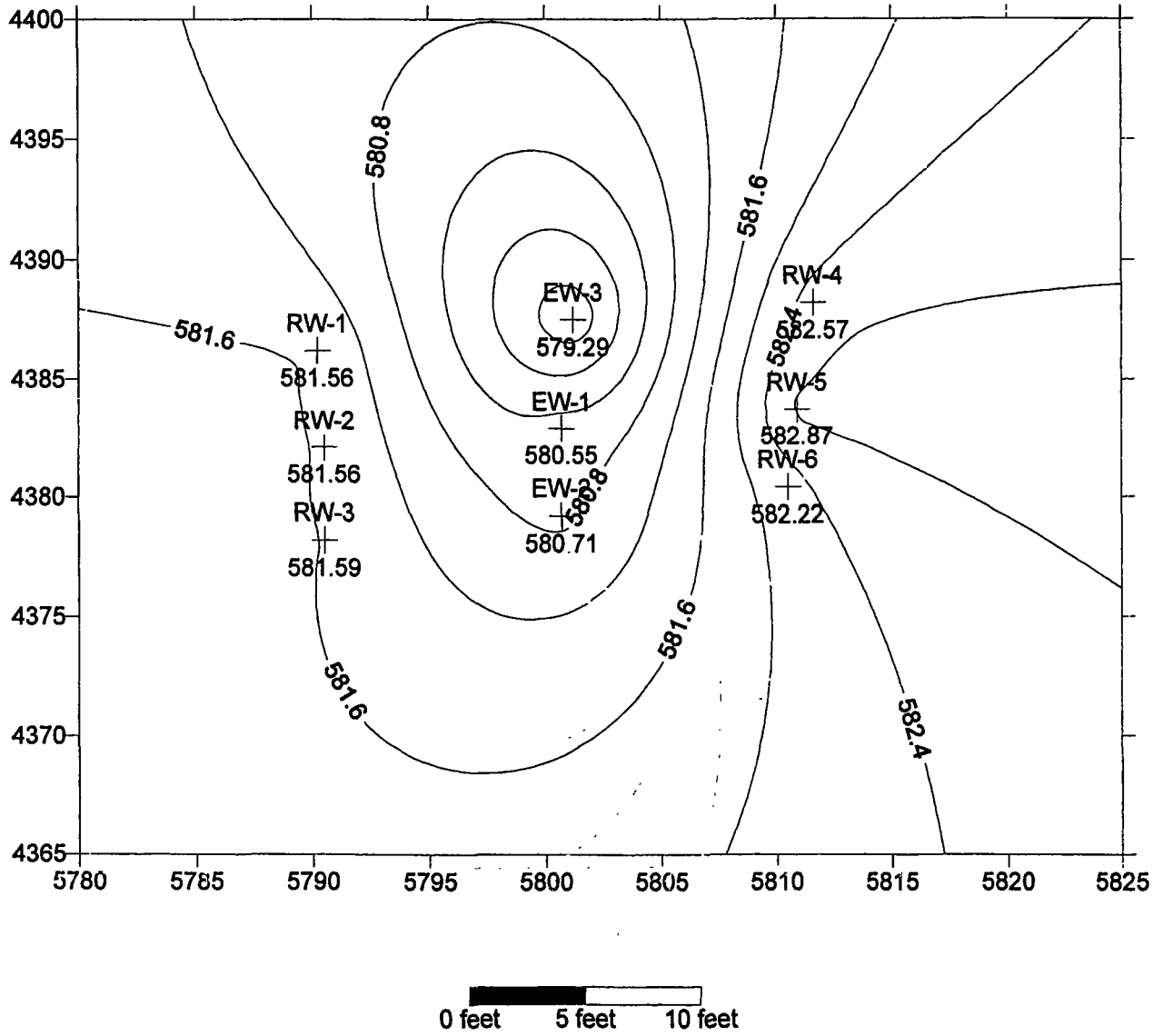
PLOT 35
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 12, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



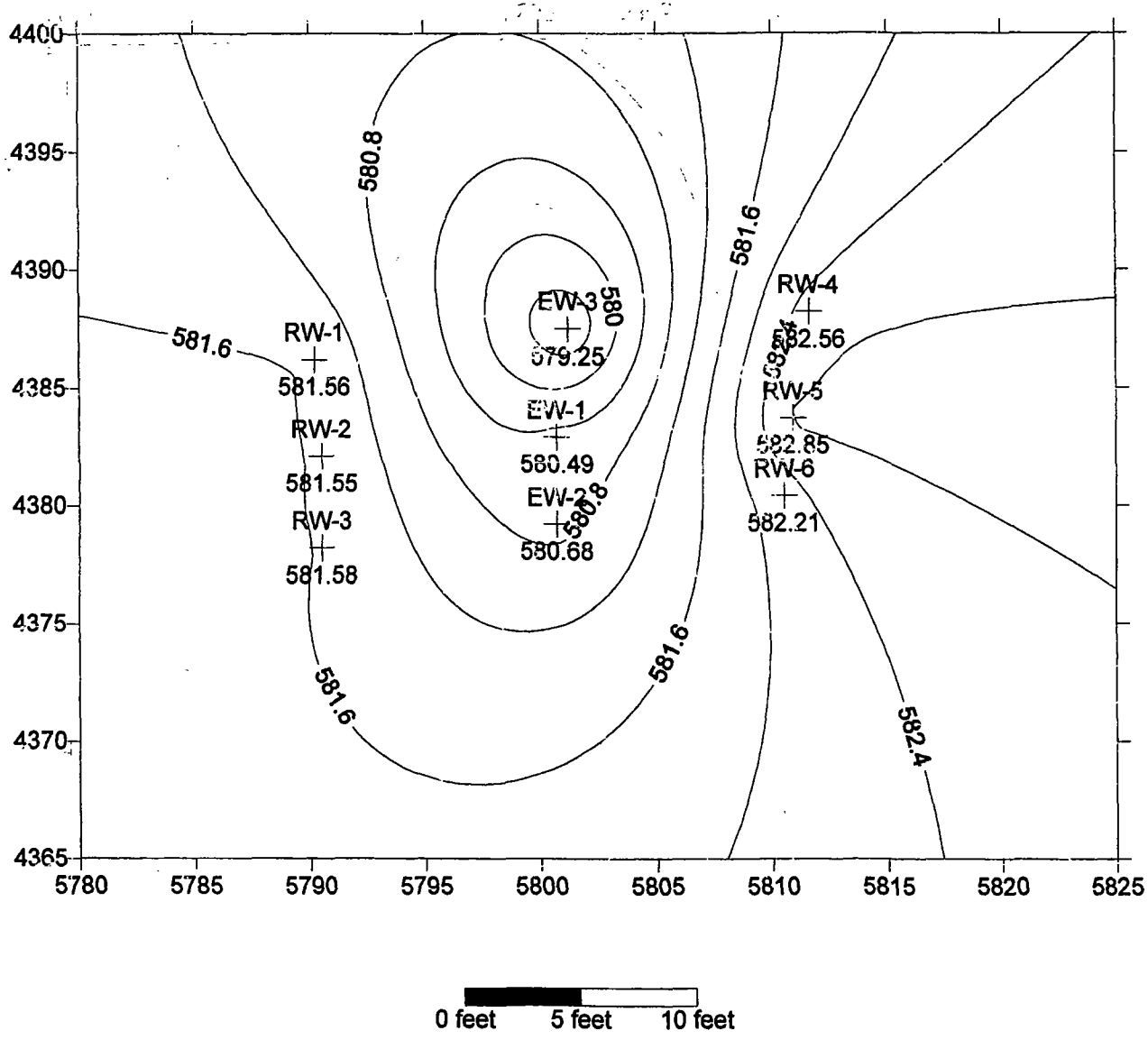
PLOT 36
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 13, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



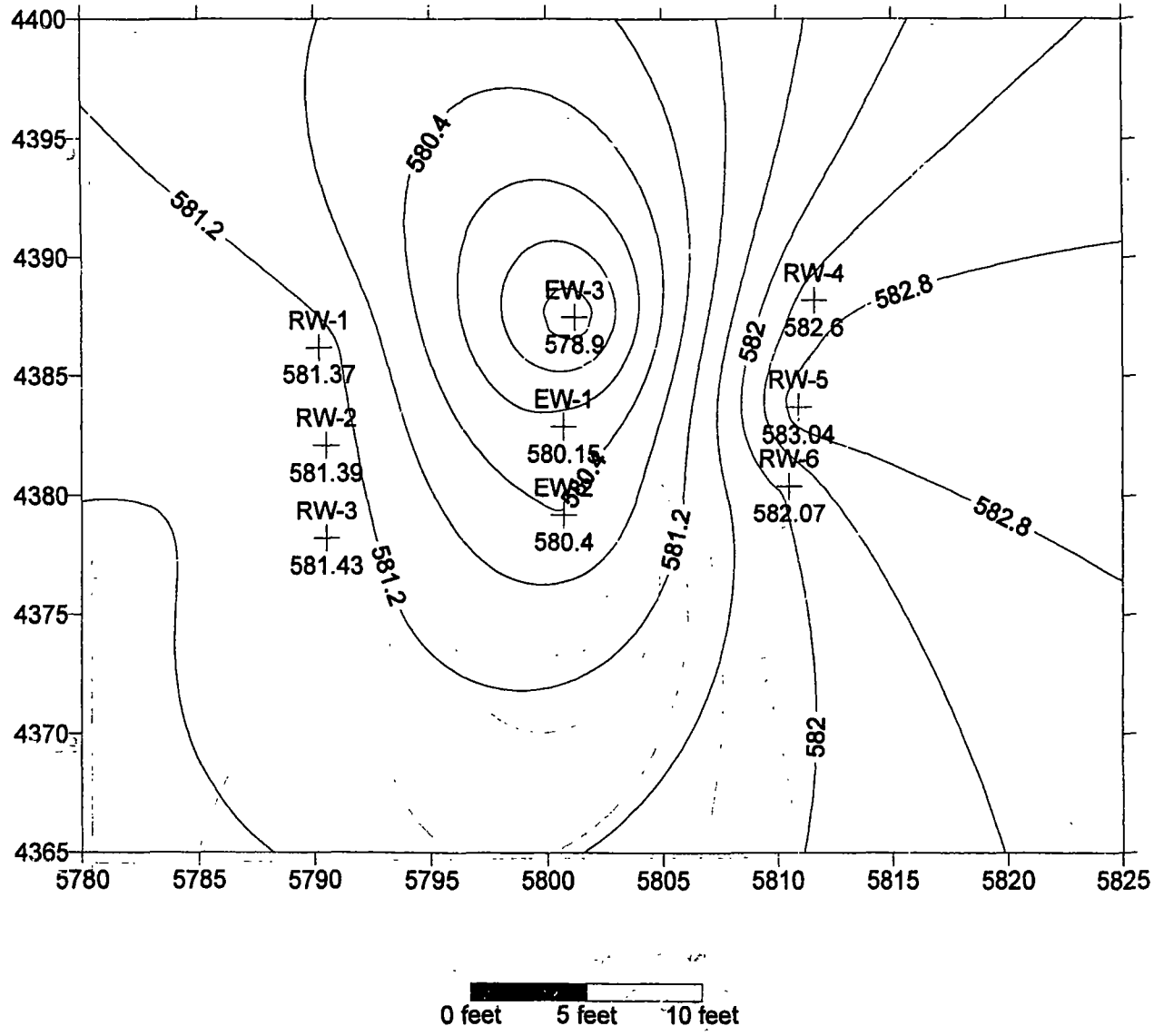
PLOT 37
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 14, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



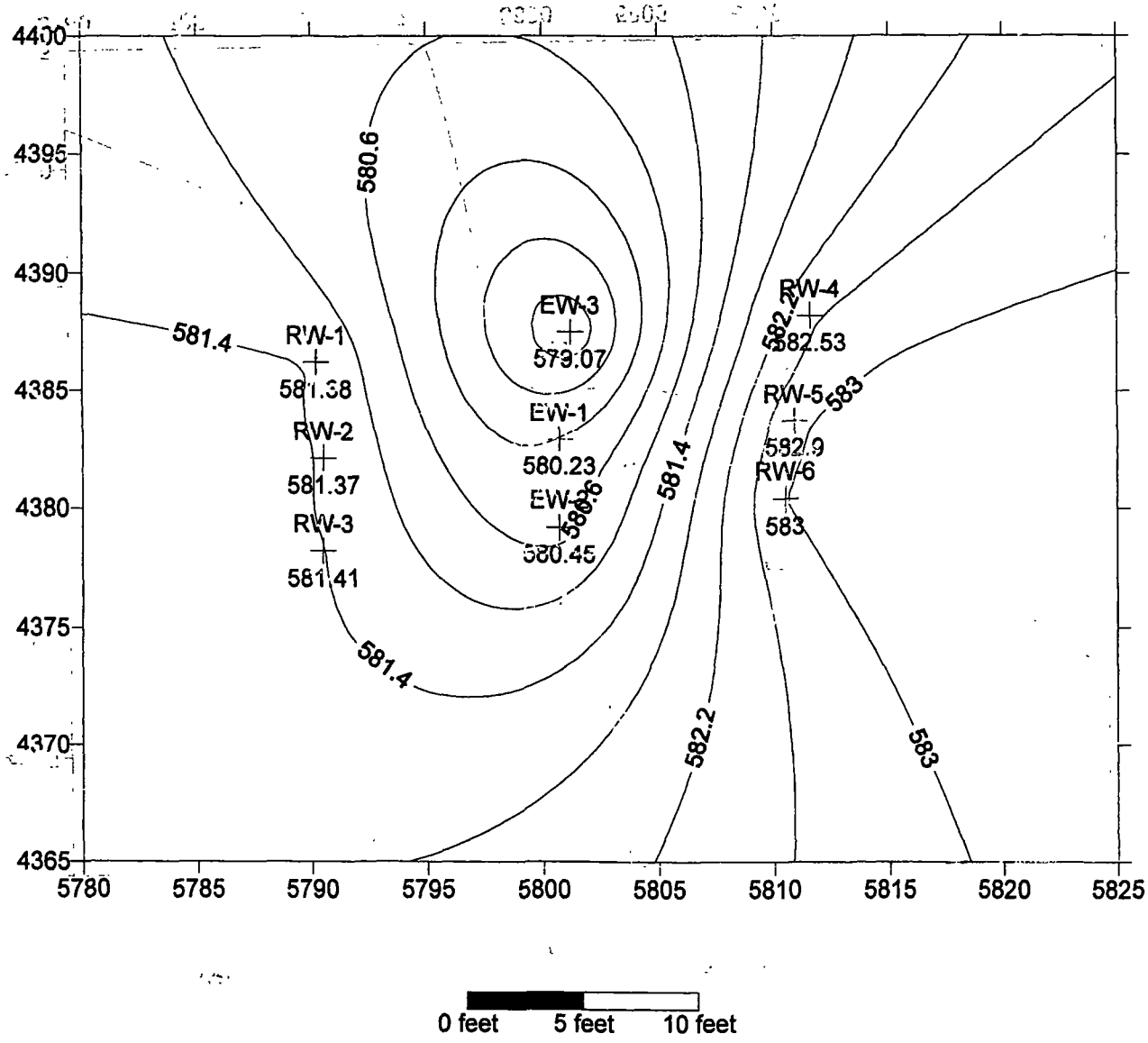
PLOT 38
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 15, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



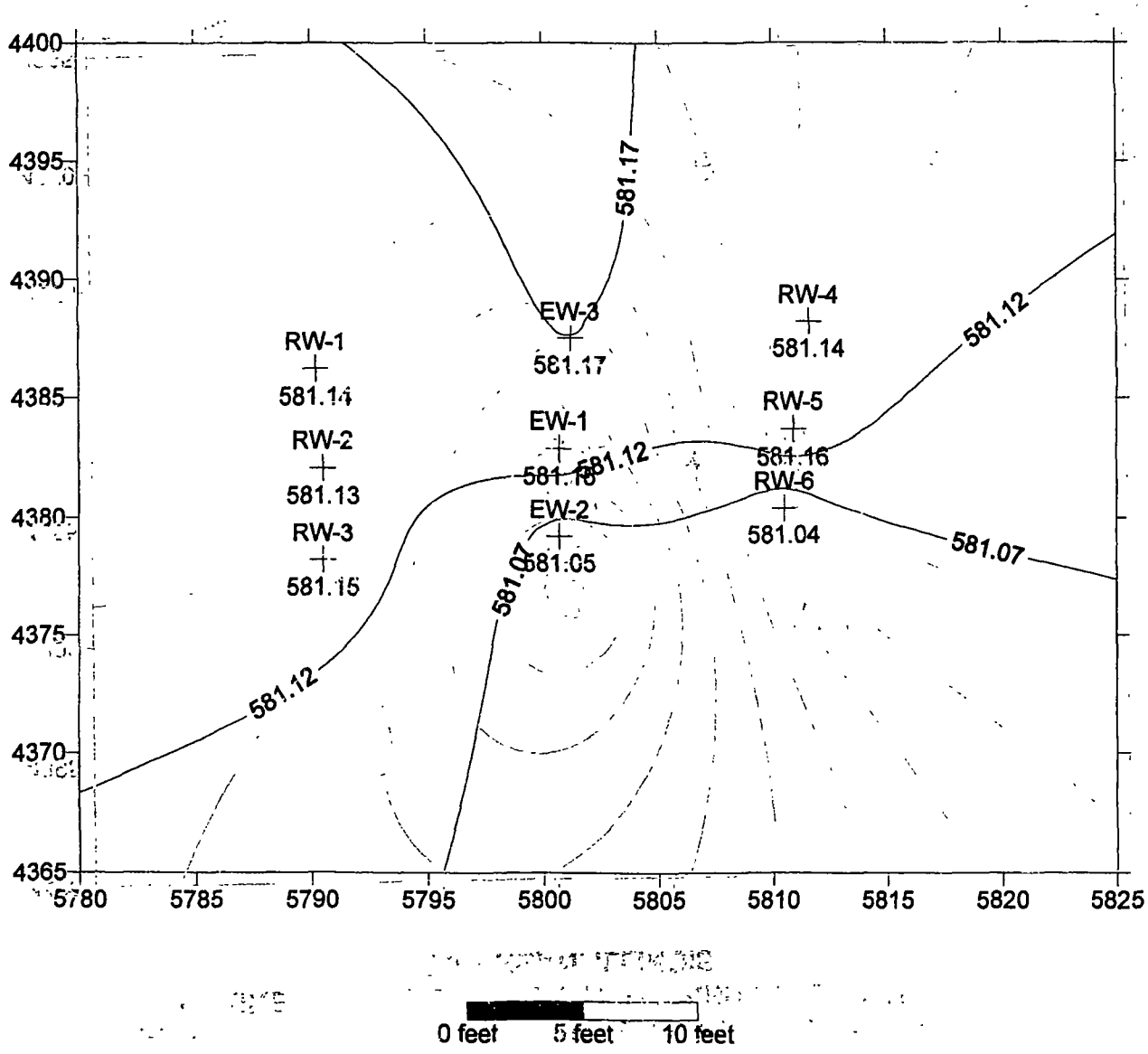
PLOT 39
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 19, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



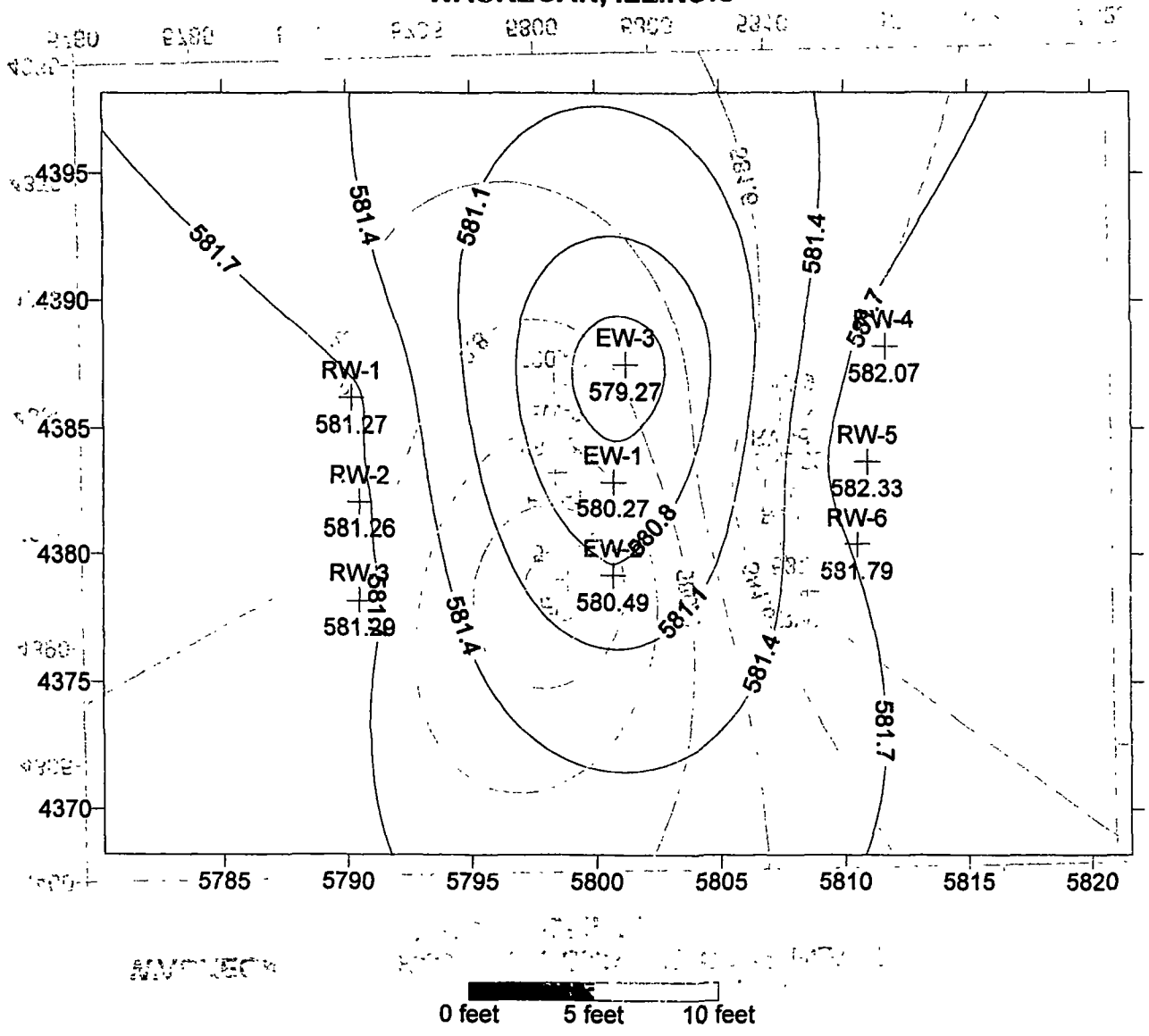
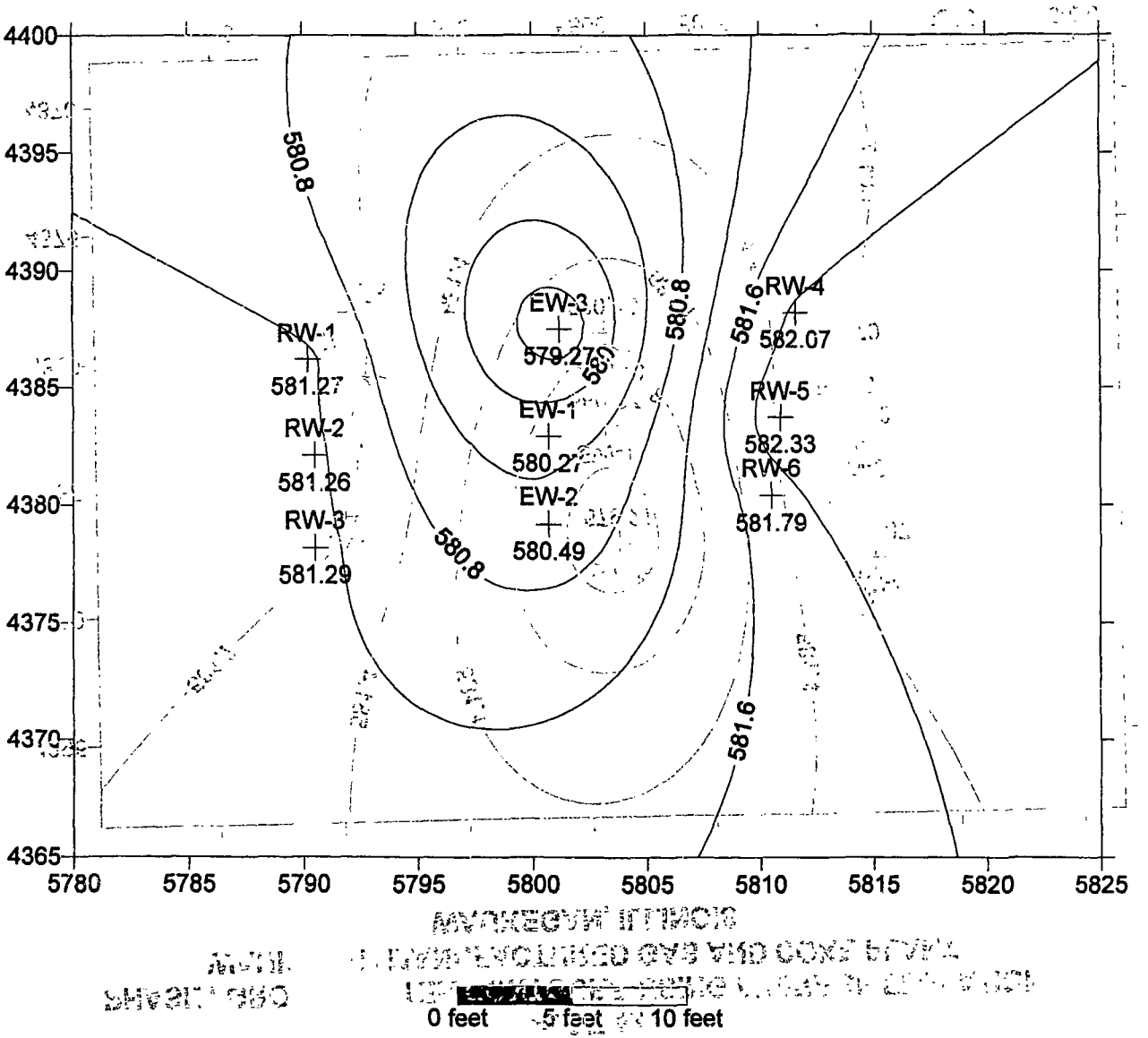
PLOT 40
PHASE 2 GROUNDWATER CONTOURS- NOVEMBER 20, 2000
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



PLOT 41
NOVEMBER 27, 2000 - POST SHUTDOWN
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



PLOT 42
PHASE I GROUNDWATER CONTOURS-USING AVERAGE ELEVATIONS
WAUKEGAN MANUFACTURED GAS AND COKE PLANT
WAUKEGAN, ILLINOIS



PLOT 43
PHASE 2 GROUNDWATER CONTOURS
USING AVERAGE PHASE 2 ELEVATIONS
WAUKEGAN MANUFACTURES GAS AND COKE PLANT
WAUKEGAN, ILLINOIS