UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

MEMORANDUM

DATE: September 8, 1999

SUBJECT: City Industries NPL Site
Five-Year Review

FROM: Curt Fehn, Chief
South Site Management Branch

TO: Richard D. Green, Director
Waste Management Division

Attached please find a copy of the Five-Year Review Final Report for the City Industries NPL Site in Orange County, Florida. Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, requires that if a remedial action is taken that results in any hazardous substances, pollutants, or contaminants remaining at the site, the Environmental Protection Agency (EPA) shall review such remedial action no less often than each five years after initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

Ground water contamination is being addressed at the City Industries NPL Site. The selected remedy for the ground water component includes ground water recovery, treatment, and disposal for the remediation of volatile organic compounds in the ground water. The ground water has not been fully remediated to performance standards established in the 1990 Record of Decision for the Site. The Remedial Action is ongoing at the Site to reduce the levels of ground water contamination below performance standards.

The attached Five-Year Review Final Report, dated August 1999, was prepared by the U.S. Army Corps of Engineers and has been reviewed by Region 4 staff. The attached report documents the current conditions at the site, states that the remedial action is ongoing and continues to be protective of human health and the environment and makes recommendations regarding future site reviews.

Based on the ongoing actions at the Site and the interviews conducted during the review, the remedial action meets the requirements of the Record of Decision. EPA will

ensure that the site remains protective by approving conducting Five-Year Reviews in the future. The next review will be conducted before May 20, 2004.

Attachment

Approved by: _____ Date: 9/13/99

Richard D. Green, Director
Waste Management Division

US Army Corps of Engineers
Jacksonville District

Superfund Five-Year Review Report

City Industries Superfund Site

Winter Park, Florida

Prepared for
U.S. Environmental Protection Agency, Region IV
August 1999

EPA Five-Year Review Signature Cover

Preliminary Information

Site name: **City Industries Superfund Site**			EPA ID: **FLD05945653**
Region: **4**	State: **Florida**	City/County: **Orange County**	
LTRA* (highlight): **Y** N		Construction completion date: **March 2 1994**	
Fund/PRP Lead: **PRP**			NPL status: **Final**
Lead agency: **EPA, Region 4**			
Who conducted the review (EPA Region, state, Federal agencies or contractor): **US Army Corps of Engineers, Jacksonville District**			
Dates review conducted: From: **6/29/99** To **8/1/99**			Date(s) of site visit: **6/29/99**
Whether first or successive review: **First**			
Circle: **Statutory** Policy		Due date: **8/1/99**	
Trigger for this review (name and date): **5 Year Review Cycle, March 1999**			
Recycling, reuse, redevelopment site (highlight): Y **N**			

Deficiencies:

No major deficiencies, affecting protectiveness, were identified.

Recommendations:

Recommendations are listed in the attached report, Section VIII: Recommendations.

Protectiveness Statement(s):

The remedial actions at the City Industries Superfund Site for the cleanup of the groundwater contamination plume are protective. Because the remedial actions at the City Industries Site are protective, the remedy for the site is protective of human health and the environment.

Other Comments:

The 5 year review of the City Industries Superfund Site follows closely with the Interim Long - Term Response Report and the Second Interim Long - Term Response Report previously submitted for this site.

Signature of EPA Regional Administrator or Division Director, and Date

_____

Signature Date

_____

Name and Title

City Industries Superfund Site
Winter Park, Florida
Superfund Five-Year Review Report

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Photo 7: Miscellaneous Valves and 5 HP Pumps
Photo 8: View of Treated Effluent Flowing into Crane Strand Canal

Attachments: Attachment A: Documents Reviewed
Attachment B: Site Inspection Checklist
Attachment C: Groundwater Contour Maps
Quartering Monitoring Results (1996-1998)
Attachment D: Water Quality Data / Whole Chronic Test,
1st Semi-Annual Monitoring Results (May 1998),
2nd Semi-Annual Monitoring Results (Nov 1998)

City Industries Superfund Site
Winter Park, Florida
Superfund Five-Year Review Report

I. Introduction and Purpose

Although not required by statute, this five-year review is being conducted in accordance with EPA policy. EPA conducts five-year reviews as a matter of policy at: (1) sites where no hazardous substances will remain above levels that allow unlimited use and unrestricted exposure after completion of remedial actions, but the cleanup levels specified in the Record of Decision (ROD) will require five or more years to attain; (2) sites addressed before SARA at which the remedy, upon attainment of cleanup levels, does/will not allow unlimited use and unrestricted exposure; and (3) removal-only sites where hazardous substances remain onsite at levels that will not allow unlimited use and restricted exposure. This site has been reviewed because cleanup levels will require more than five years to attain.

The U.S. Army Corps of Engineers, Jacksonville District (USACE-JAX), on behalf of the U.S. Environmental Protection Agency (EPA), Region IV, have conducted a five-year review of the remedial actions implemented at the City Industries Superfund Site in Goldenrod Township, Winter Park, Florida. This report documents the results of that review.

This is the first five-year review for the City Industries Superfund Site following the completion of an Interim Long Term Response Action (LTRA) Report and a Second Interim LTRA Report. The trigger for this policy review is the date of (triggering action) as shown in EPA's WasteLAN database (March 2, 1994). The purpose of five-year reviews is to determine whether the remedial actions at a site are protective of human health and the environment. Moreover, hazardous substances, pollutants, or contaminants will not remain onsite, but what has specifically activating this review is that more than five years are needed to complete remedial actions. The methods, findings, and conclusions of this review are documented in five-year review report. In addition, the five-year review report identifies deficiencies found during the review and makes recommendations to address them. All remedies have been constructed, and the groundwater pump and treat system continues to operate as intended.

This review will be placed in the Site files and local repository for City Industries Superfund Site. The repository is located at the Winter Park Public Library, 460e. New England Avenue, Winter Park, Florida.

II. Site Background

A. Site Description

The City Industries Superfund Site is located in central Florida, in Goldenrod Township, which is in the eastern section of Orange County, Florida, approximately 1.2 miles east of Winter Park and 2.2 miles northeast of Orlando. The site is bounded by Cato Steel, a metal fabricator, to the north, Top-gun Gunite to the west, Forsyth Road to the east, and a wooded area (now being cleared) to the south. Figure 1 presents the relationship of the site to the surrounding areas. A nearby waterway includes Crane Strand Canal, which accepts runoff from the site via 6-inch PVC pipeline.

The City Industries Superfund Site consists of a one-acre site situated in a light industrial area. Activities at the facility included the receipt, handling, storage, reclamation, and disposal of various waste chemicals. General classes of waste handled included chlorinated and non-chlorinated organic solvents, paint and varnish wastes, acid/alkaline plating wastes, and waste ink.

The geology of the site can be described as follows; the site is underlain by approximately 60 feet of sands, silty sands, and clayey sands containing variable amounts of unconsolidated lime rock, chert, and phosphate fragments. Silt and clay content of the soils generally increase with depth. The surficial soils are underlain by the Hawthorn Formation at depths of 60 to 70 feet below land surface (bls). The Hawthorn is characterized by up to 170 feet of inter-layered clayey gravel, clayey sand, clay, and limestone layers. The karstified, erosional limestone surface of the Ocala Formation is found beneath the Hawthorn at depths ranging from 140 too greater than 230 feet bls.

The surficial aquifer occurs in the uppermost 60 to 70 feet of permeable sands and is reportedly separated into an upper unconfined zone and a lower, semi-confined zone. The water table is encountered at depths of 3 to 5 feet bls. Groundwater flow is to the east at flow velocities ranging from about 10 to 145 feet per year. Flow rates generally decrease with depth and are greater during the summer's wet season than the dry season.

The Floridan aquifer, widely used as a source of potable water in the region, occurs in a thick sequence of limestone units generally encountered at the top of the Ocala Formation. The Ocala was identified at a depth of 237 feet during drilling of the Floridan Aquifer monitoring well, however, depth to the Floridan Aquifer from land surface may vary from about 140 to more than 230 feet in Orange County.

B. Site Chronology

In 1971, City Industries, Inc. purchased the fuel oil business previously owned and operated by Charles BIackburn. Mr. Blackburn retained ownership of the property

at Forsyth Road. In 1977, it developed into a recycling and transfer facility for hazardous wastes. Due to inadequate plant practices and intentional dumping, soil and groundwater at the site became contaminated. From 1981 through 1983, EPA and Orange County found the company to be out of compliance with safety and Resource Conservation and Recovery Act (RCRA) requirements, and ordered the business to be closed in July 1983.

In August 1983, the site was abandoned by the owner/operator of City Industries, Arthur Greer, leaving approximately 1,200 drums of hazardous waste and thousands of gallons of sludge in a number of large holding tanks on the site. A removal action to remove hazardous waste (drums and some tanks) was conducted by the Florida Department of Environmental Protection (FDEP) during August and September 1983.

In early 1984, EPA issued an Administrative Order under CERCLA requiring City Industries to clean up the sludge remaining in the holding tanks, remove contaminated soils, and treat the contaminated groundwater. City Industries did not comply with EPA's Administrative Order. Beginning in February 1984, the remaining sludge and storage tanks were removed by EPA. In May 1984, EPA removed 1670 tons of contaminated soil, heat treated it and returned it to the site. Additionally, 180 cubic yards (270 tons) of highly contaminated soil were removed and transported to a hazardous landfill for disposal.

In August 1984, the City Industries Site was proposed for the National Priorities List (NPL). In December 1985, the facility owner was indicted for hazardous waste handling violations and other criminal charges. He was found guilty of 17 counts and received a jail sentence.

In May 1986, a multi-phased Remedial Investigation (RI) at the Site was completed by FDEP, the lead agency at the site. EPA notified approximately 250 potentially responsible parties (PRPs), primarily waste generators, of their potential liability for remediation of the site and demanded payment for cost incurred during the removal of wastes. A settlement with approximately 163 PRPs for $550,722 was obtained in July 1988.

In March 1989, EPA took over as the lead agency for the site. The Potentially Responsible Parties (PRPs) conducted a Feasibility Study (FS) under a consent agreement between the PRPs and FDEP. The FS was completed in December 1989 and the RI/FS and Proposed Plan was released to the public in February 1990.

In March 1990, EPA issued a Record of Decision (ROD) outlining EPA's selected and contingency remedy for the Site.

In September 1990, EPA signed a Consent Degree with the PRPs to have them finance the Remedial Action (RA) at the Site as well as reimburse EPA for the Remedial Design (RD) and other past costs. In April 1992, the remedial design was completed.

In January 1993, a contract was awarded to the RA contractor (ERM-EnviroClean) for treatment of the groundwater contamination by air stripping.

In May 1993, Notice to Proceed (NTP) was given to ERM-EnvironClean and they mobilized on-site. The U.S. Army Corps of Engineers (USACE) provided construction over-site on behalf of EPA. A pre-final inspection was conducted at the Site on October 1993 and the inspection indicated that construction was substantially complete and that the system was ready for startup and operation. However, a punch list of items was developed at this inspection.

An Explanation of Significant Differences (ESD) was prepared to add two contaminants of concern to the list provided in the ROD, based on sampling conducted during the RA. The ESD also served to explain why secondary treatment of the effluent was not required prior to discharge. Patrick M. Tobin, EPA Region IV's Deputy Regional Administrator, signed the ESD on February 14 1994.

On March 2 1994, a Preliminary Close -Out Report was submitted which documented construction completion at the Site. EPA determined that as of May 19 1994, the remedy was fully operational and functional (O & F) and all punch list items were completed.

On May 20 1994, a final inspection was conducted and Operation and Maintenance (O & M) commenced. The Long- term Response Action (LTRA) began on this day with the onset of O & M activities.

On September 19 1994, a Final Remedial Action Report (RAR) was generated and submitted to South Superfund Remedial Branch.

In January 1997, EPA prepared and submitted an Interim Long-Term Response Action Report. This report describes the O&M activities performed by EPA's on-site contractor at the Site during the period from May 20 1994 to July 7 1996.

In October 1998, EPA prepared and submitted a Second Interim Long-Term Response Action Report. This report describes the O&M activities performed by EPA's on-site contractor at the Site during the period from July 8 1996 to March 11 1998.

Table 1 summarizes the chronology of the major actions at City Industries Superfund Site.

Table 1: Chronology of Site Events.

Event	Date
Initial discovery of the problem	1981-1983
Removal Actions (RA) by FDEP	1983
NPL listing	1984
Remedial Investigation and Feasibility Study (RI/FS) released to the public	Feb 1990
Record of Decision (ROD) signature	Mar 29, 1990
Consent Degree with PRPs signed	Sep 1990
Remedial Design (RD) completed	Apr 1992
RA Contract awarded	Jan 1993
NTP issued for construction start	May 1993
Pre- Final Inspection/construction completion	Oct 1993
Explanation of Significant Differences (ESD) signed	Feb 1994
Preliminary Close Out Report/Punch List completed	Mar 1994
Long Term Response Action (LTRA) begins	May 20,1994
Final Remedial Action Report (RAP)	Sep 1994
Interm LTRA Report (5/20/94 - 7/7/96)	1997
Second Interm LTRA Report (7/8/96-3/11/98)	1998

III. Results of Site Investigations

A. Initial RI/FS Activities

A multi-phase Remedial Investigation (RI) was conducted by FDEP during the years of 1986 and 1987. The findings of the RI confirmed the presence of chemical constituents in the shallow groundwater aquifer underlying the City Industries Superfund Site. Plume delineation results established that the areal distribution of impacted groundwater extended beyond the site property boundaries. A data augmentation program was conducted in 1987 to provide more recent data for constituents previously detected at the site and define the migration of the groundwater plume since the initial RI was performed. The results of the RI and data augmentation program indicated that several target list compounds were present in the shallow aquifer. The data also indicated that the groundwater plume had migrated down gradient from the City Industries Superfund Site.

B. Contaminants of Concern

There were fourteen Contaminants of Concern (COCs) identified during the two studies and they are listed as follows: (1) acetone, (2) benzene, (3) 1,1 – dichloroethane, (4) 1,2 – dichloroethane, (5) 1,1 – dichloroethene, (6) ethylbenzene, (7) methylene, (8) chloride, (9) methyl ethyl ketone (MEK), (10) methylisobutyl ketone (MIBK), (11) tetrachlororethene, (12) toluene, (13) 1,1,1 – trichloroethane, and (14) trichloroethene.

C. Potential Pathways for Contaminant Migration

Major pathways of potential exposure to the fourteen COCs were identified as: contact with, and ingestion of, small quantities of surficial soil; contact with, and ingestion of, drainage ditch waters; contact with, and/or ingestion of, groundwater pumped for bathing, hypothetical drinking water usage, landscape irrigation and/or other non-potable usage's.

Surficial Soil Contact- Exposure scenarios for exposure to the soils were evaluated for a worker (i.e. Cato Steel employee) or a child trespasser.

Drainage Ditch Exposure - Wading and accidental immersion are potential exposure scenarios. The drainage ditch is located along a street with relatively high traffic volume; therefore, the frequency of exposure at this site is assumed to be relatively low.

Groundwater Exposure - There are presently no wells screened in the shallow aquifer identified down gradient of the site. Therefore exposure scenarios considered a

hypothetical well installed down gradient in the future. Potential non-drinking water exposures considered as hypothetical future exposure scenarios included using groundwater for bathing (showering), landscape irrigation, or for filling small swimming pools. The bathing exposure is considered independent of the drinking water because some receptors may utilize tap water for bathing but use bottled water for drinking. Inventories taken of wells within a two-mile radius identified no potable wells down gradient of the site, or non-potable wells screened in the shallow aquifer within one mile down gradient of the site. There is one non-potable well 500 feet north of the site. The City of winter park's well field is located approximately 1,900 feet west of the site, however, these wells draw from a minimum of 700 feet below the ground surface in the Floridan aquifer, and there is a 140-foot thick confining layer separating the contaminated surficial aquifer from the Floridan Aquifer.

D. 1989 FS Activities

Potentially Responsible Parties (PRPs) conducted a Feasibility Study (FS) under a consent agreement between the PRPs and FDEP. The FS was completed in December 1989.

E. Summary of Site Risks

The risks from exposure to contaminated groundwater from the City Industries Superfund Site via potable and non-potable wells are unacceptable for both carcinogenic and non- carcinogenic risks from ingestion of the groundwater. Presently, individual exposure via ingestion of contaminated groundwater is not occurring. However, unacceptable risk levels for the baseline assessment indicate that groundwater treatment is necessary to prevent the potential human exposure to acceptable levels of contaminants in the future.

Environmental Risk – Environmental risk is likely as the site is located in an urban area with surrounding industrial and commercial land use, but it has limited potential for utilization as a terrestrial ecosystem. The site is partially fenced and movement of animals onto the site is limited but not completely restricted. Crane Strand Wetlands are located to the north of the site; however, there is no hydrologic connection between the City Industries Superfund Site and the wetlands. Drainage-ditch waters from the City Industries Superfund Site flow east to an Orange County drainage canal, then south away from the wetlands. Concentrations reported in the drainage-ditch waters at the site do not exceed any USEPA Ambient Water-Quality Criteria established to protect fresh-water aquatic life.

Cancer Risk - Excess lifetime cancer risks are determined by multiplying the intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (e.g., 1×10^{-6} or 1E-6)

The lifetime cancer risk associated with suspect carcinogens reported at the City

Industries Superfund Site is;

Constituent	Cancer Risk By Ingestion	Potency Factor
benzene	1.7×10^{-5} m/l	$.029 \times 10^{-1}$.mg/kg/day
1,1-dichloroethene	4.9×10^{-3}m/l	$.060 \times 10^{-1}$.mg/kg/day
methylene chloride	4.1×10^{-3} m/l	$.0075 \times 10^{-1}$.mg/kg/day
tetrachloroethene	3.5×10^{-4} m/l	$.051 \times 10^{-1}$.mg/kg/day
trichloroethene	5.6×10^{-3} m/l	$.011 \times 10^{-1}$.mg/kg/day
bis(2-ethylhexyl)phthalate	1.5×10^{-6} m/l	$.014 \times 10^{-1}$.mg/kg/day

Noncarcinogenic Risk – potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ) or the ratio of the estimated intake derived from the contaminant concentration in a given medium to the contaminant reference dose. By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated.

The Hazard Index associated with suspect noncarcinogens reported at the City Industries Superfund Site are;

Constituent	Hazard Index By Ingestion	Reference Dose
Acetone	10.2	.10 mg/kg/day
t-1,2-dichloroethene	3.3	.01 mg/kg/day
ethylbenzene	.04	.10 mg/kg/day
methyl ethyl keytone	1.1	.05 mg/kg/day
methyl isobutyl keytone	10.6	.05 mg/kg/day
toluene	.24	.30 mg/kg/day
1,1,1-trichloroethane	.53	.09 mg/kg/day

A potential risk was determined to exist for:

1. Future migration of contaminated groundwater to off-site users.
2. Future leachate run-off to nearby waterways, resulting in environmental degradation and detrimental impacts on aquatic life.
3. Exposure to contaminated groundwater by ingestion and direct contact through future development of the site and adjacent areas.

IV. Summary of Response Actions

A. Remedial Objectives

The purpose of the remedial action at the City Industries Superfund Site was to mitigate and minimize contamination in the groundwater, and to reduce current and future potential risks to human health and the environment. Based on the level of

contaminants found at the Site, the endangerment assessment, and regulatory requirements, the following clean-up objectives were determined:

Be protective of human health and the environment from exposure of groundwater

Attain applicable or relevant and appropriate requirements (ARARs) of State and Federal regulations

Be cost-effective

Utilize permanent solutions and alternate treatment technologies or resource recovery technologies to the maximum extent practicable

Address whether the preference for treatment that reduces toxicity, mobility, or volume as a principle element is satisfied.

B. Remedy Selection

The record of decision (ROD) for the City Industries Superfund Site was signed on March 29, 1990. The selected remedy consisted of pumping the groundwater, treating it by air stripping, and discharging it to the Iron Bridge Publicly-owned Treatment Works (POTW). The contingency remedy included pumping the groundwater, treating it by air stripping, and discharging it to a nearby canal. Prior to discharge to the canal, the ROD called for secondary treatment of the effluent with carbon adsorption, oxidation, precipitation, sedimentation, and filtration to further remove metals, suspended solids, and ketones which may prevent the effluent from meeting all discharge requirements. Because EPA and POTW were unable to reach agreement with regard to the City Industries discharge, EPA implemented the contingency remedy.

In September 1990, EPA signed a Consent Decree with the PRPs to have them finance the remedial Action (RA) at the Site as well as reimburse EPA for the Remedial Design (RD) and other past costs. EPA hired a contractor to design the groundwater extraction and treatment system at City Industries Superfund Site. The RD was completed in April 1992 and included specification of a performance based treatment system.

C. Remedy Implementation

The remedy implemented at the City Industries Superfund Site for the cleanup of the Groundwater contamination plume consists of a pump and treat system as shown in Figures 1 and 2. The groundwater recovery system consists of thirteen groundwater recovery wells (R-1 through R-13) in two groups, which were place across the width of the contaminant plume, and located on five adjacent properties east of the original Site.

The first group consists of eight wells (R-1 through R-8) located just down gradient from the Site; these wells were intended to intercept contamination first, as it flows east from the Site to the Crane Strand Canal. Each well consists of a submersible pump with a design capacity of 10 gallons per minute. The second group consists of five wells (R-9 through R-13) located further down gradient and closer to the leading edge of the contaminant plume. The submersible pumps installed in wells R-9 through R-13 were designed to operate at 5 gpm. The total flow rate for all thirteen wells is 105 gallons per minute (gpm) plus or minus 25 gpm to allow for variability of well and pump performance. The water is pumped from the wells through a network of over 18,000 feet of fused underground high density polyethylene piping to a 1500 gallon equalization tank. The influent water is then pumped from the equalization tank to an air stripper with blower for final treatment. The stripping tower package is designed to increase the surface area of the water allowing the target volatile organic compounds to evaporate to the air forced over the water. The effluent water is then discharged into the Crane Strand Canal located at the eastern side of the Sears property. Off gas generated from air stripper is vented to the atmosphere. Contract personnel regularly sample the effluent water and off gas to verify compliance with the applicable environmental permits. The instrumentation and controls for the system consist of magnetic flow meters for each well, level control switches, computer controller, alarm system with auto-dialer, strip chart system recorder, pH meter, and all associated wiring.

In addition to the thirteen (13) recovery wells, seven (7) new monitor well clusters were installed at the extreme limits of the plume with one cluster in the middle. Each well cluster consists of a 40 foot monitoring well that is screened 30 feet to 40 feet below ground surface (bgs) and a 60 foot monitoring well that is screened from 50 feet to 60 feet bgs.

D. Operation and Maintenance

System Operations/O&M The routine operations and maintenance (O&M) activities at the City Industries Site requires an operator present on-site to monitor performance of the recovery, aeration, and discharge system components. Efficient operation of an air-stripper also requires periodic cleaning or replacement of the tower's packing media to avoid clogging from accumulated biological growth or precipitated matter. Periodic monitoring of the groundwater will be performed to assure that the remedy is working. ERM-EnviroClean was retained to operate and maintain the system.

System Concerns There are sources of concern related to O&M of the recovery and treatment systems. The greatest O&M concern in the recovery system has been biological growth on the extraction pumps, which tends to reduce pump extraction rates. When pump performance decreases from 10 gpm to approximately 6 gpm or from 5 gpm to approximately 3 gpm, the poorly performing pump is typically removed from service and replaced with a freshly cleaned pump. The pump(s) removed are then

cleaned for later installation. A record of pump services required during O&M operation (1998 through 1999) due to biological growth can be found in monthly reports submitted by the on-site contractor (ERM-EnviroClean). The second source of concern is the biological growth potential in the equalization tank and air-stripping tower. The growth could degrade system performance below design and permit requirements. ERM-EnviroClean installed a chlorination system in the equalization tank similar to a swimming pool chlorination system. Solid chlorine tablets in a release canister are suspended in the equalization tank. The chlorine kills and prevents biological growth in the system. The chlorine is then removed by the air-stripper prior to discharge of the equalization tank water. The last area of concern relates to the degradation of the original fourteen target organic compounds into other products. The estimated maximum influent concentrations were not based upon recovery well test, but estimated due to the time lag to pull the contamination to the wells. Regular testing of the wells will indicate the peaks for the various compounds and the additional testing for all VOC's will detect degradation products. Additionally, meeting all permit and discharge requirements represents another area of concern. Air monitoring, chemical tests for VOC's, and water tests for Chronic Toxicity all provide a direct correlation to system performance.

ERM-EnviroClean prepared an Operation and Maintenance (O&M) Manual which details the operation of the extraction and treatment systems, provides a schedule for maintenance activities, and outlines monitoring requirements in accordance with the specifications. The base contract period allowed for 730 operational (payable) days over 780 calendar days, which allows for 50 days of maintenance down time. A successful operational day is defined as a 24-hour period of continuous treatment at a flow rate of 105 (+/- 25) gpm while meeting the required treatment performance standards identified above. Details of pump repairs made during the 1st Optional Contract period and 2nd Optional Contract period which covered the entire 730 day base period can be found in the 1998 Second Interim Long Term Action Report. The amount of water pumped through the extraction wells during the two optional operating periods total approximately 79 million gallons. Detailed maintenance records are also available at the Site.

In November 1996, the O&M Manual was revised to reflect operation and maintenance changes prior to completion of the contract. A revision to the pumping configuration was made. Pumps R-1, R-2, and R-8 were changed from 10 gpm to 5 gpm and R-10, R-11, and R-12 were changed from 5 gpm to 10 gpm.

System Operations/O&M Activities Monthly reports from January 1998 through May 1999 indicate the following O&M activities/repairs that were made:

Jan '98

- Recovery Well R-13 was converted from stainless steel down well pipe to HDPE down well pipe.

Feb ’98

- Phone line to auto-dialer repaired. Heavy rains and winds pulled temporary splice apart. The Telephone Company (GTE) still waiting on it’s contractor to hang the phone line back on poles from last repair (lightening strike).
- Alarm #3 (transfer blower discharge had failed to start) called the Site operator’s home at 0300 hrs.
- Recovery Well R-6 shuts off at 0400; reason unknown
- 3-inch ball valve handle was replace on influent line.

Mar ’98

- Recovery Wells R-4 & R-12 adjusted to new contractual flow requirements.
- Phone lines replaced and hung on telephone poles.

Apr ’98

- Ceased operation of Recovery Wells R-1 R-2 & R-8 to meet new contractual pumping rates.
- Inspection of R-11 indicated excessive fibrous growth in well. A new pump was installed in this well.
- Universal Engineering, under contract to adjacent property owner, drilled and installed a shallow monitoring well across from Sears on Forsyth Road. This well is located between City Industries monitoring wells MW-6 and MW-9I. The point of contact for the property owner is Mr. Scott Graf, PG.
- Coordinated by telephone with Ms. Joyce Shannon, St. John’s Water Management District on the following items;

(a) Calibration of flow meters - Consumptive Use permit requires calibration information every three years. Since the system has been in operation for nearly three years the calibration information was due. However, Ms. Joyce agreed to waive this three year requirement since the flow meters were recently calibrated (Nov 97) and the contract for O&M was recently transferred to OWT/EMCON. The next flow meter calibration could be forwarded three years from the contract transfer date. She further agreed to let the flow meter be calibrated by Mr. Behnke, on-site operator, or other field staff.

(b) Recovery wells identification tags to be placed in well vaults

- Coordinated with EPA (Mike Donehoo) and FDEP (Clayton Smith) on submittal of March 1998 Detailed Monthly Report (DMR)

May ’98

- First semi-annual sampling event begun and completed.
- Chronic Toxicity Test sampling begun and completed.

Jun ’98

- Results from 1st semi-annual sampling event and Chronic Toxicity Test.
- The chart recorder ribbon failed to operate normally. The daily flow was calculated from the Foxboro IMT20 flow transmitter readings recorded on the Daily

Field report.

- ERM-EnviroClean received notification that USACE has signed the original manifests and forwarded them to OWT EnviroTech site personnel. The removal of on-site drums is now schedule for July 10 1998.

Jul ’98

- ERM-EnviroClean, Inc., subcontracted with Chemical Conservation Corp. to remove drums containing air stripper tower sludge and spent muratic acid.
- EPA visited Site for semi-annual meeting and USACE visited Site for monthly monitoring.
- Vapor discharge removed from air stripper tower and packing media changed in tower.
- Repaired guy wire anchor near light pole.
- Replaced battery in the auto dialer.

Aug ’98

- Recovery wells R-1 & R-8 turned on to test pumps and clean lines. Similar activity will be conducted at R-2 & R-9, as needed, to maintain operation of these pumps.

Sep ’98

- Transfer pump #1 intermittently (approx. every 15-20 hours) trips and shuts system down. (Symptom: auto dialer sends alarm number 3 followed by alarm number 2, when personnel arrives on-site cycling power to the PLC restarts the groundwater treatment system.) The on-site operator (OWT) is trouble shooting Programmable Logic Controller (PLC) to verify why the PLC does not recognize the input signal from the Fisher, Porter & Bailey single conductivity probe. OWT personnel are currently restarting the system manually until the problem can be located and resolved.

Oct ’98

- Purge the groundwater in monitoring wells 23 D & 23 I by operating R-8.
- Cleared the PLC fault table; system controls functioned for approx. 60 hours before operational failure.
- Transfer pump #1 failure suspected; upon inspection on-site operator transferred PLC input module #4 with #5 input module; PLC output module # 6 transfer with output module #7. PLC still did not allow groundwater treatment controllers to function in an automatic mode. Manual operation of transfer pump #1 begun.
- PLC fault table cleared and system logic trouble shooting begun.
- Removed transfer pump #1 from service and installed spare transfer pump. However, spare transfer pump noisy (possible bad bearings). Removed spare transfer pump from service and reinstalled original transfer pump #1, which had been repaired.
- Groundwater treatment system operates intermittently (tripping the motor overload switch). On-site operator exchanges motor overload relays between transfer

pumps #1 and #2. However, the overload relay tripping problem persists.

- Transfer pump #1 tripped the motor overload relay and would not operate in the automatic mode. Transfer pump #2 installed as transfer pump #1. Transfer pump #1 repaired using the breaker, motor starter and motor overload relay switches from transfer pump # 2. Groundwater treatment system operated without failure for remainder of the month.

Nov ’98

- Second semi-annual sampling event begun and completed.
- Chronic Toxicity Test sampling begun and completed.
- Replaced the 50 foot, 480 volt 3 phase teflon lead in recovery well R-5.

Dec ’98

- Replaced the 50 foot, 480 volt 3 phase teflon lead in recovery well R-11.

Jan ’99

- Y2K compliance actions: Westronics Data Digital Recorder and GE/FANUC Programmable Logic Controller are checked for Y2K compatibility.

Feb ’99

- Rehabilitation of R-11 performed.
- Y2k compliance actions: the sampler model located at the Site only recognizes the last two digits of the year. When the year rolls over to “00“ ISCO’s technical representative indicates this will not cause a problem with the unit’s controller.

Mar ’99

- Exceeded BOD parameters in the groundwater extraction and treatment facility system’s effluent samples. On-site operator investigates BOD problem.
- Changed the packing media in the air stripper tower and next NPDES BOD sample resulted in a < 4.0 mg/l.

Apr ’99

- Nothing to report.

May ’99

- Change the battery in the RACO Verbatium auto-dialer.
- Third semi-annual sampling event begun and completed.
- Chronic Toxicity Test sampling begun and completed.

<u>O&M Original Costs</u> The contract allowed for 730 payable days and 50 maintenance days during the base period. In reality, the base operational period lasted 781 days. EPA reimburses ERM-EnviroClean for 659 operational days and identifies 122 non-operational days during that period. The cost per payable day obligated in the original contract amounted to $551.37 (or $402,500.10 for 730 days). Excluding modifications, EPA paid $363,352.823 for 659 days. Including modifications, EPA paid

$388,916.12 for 659 days.

O&M Modification Costs There were two modifications to the contract that applied to the optional operation periods; $13,906.00 of compensation to the contractor for reporting all the VOC concentrations detected instead of only the fourteen target compounds and $1,483.80 of compensation to the contractor for additional testing requested during change in pumping configuration. Finally, one change was approved which did not require contract modification; that change was for NPDES permit costs totaling $10,302.00 associated with EPA's delegation of the program to FDEP.

O&M Current Costs The operator indicated that current O&M costs were approximately $340.00 per day. This is lower than when operations first began and costs were approximately $562.00 per day.

V. Summary of Site Visit and Findings

A. General

The City Industries Site five-year review site inspection was held on June 29, 1999. The following people participated in the review:

1. Greg Mellema, USACE HTRW Center of Expertise, Geotechnical Engineer
2. Lindsey Lien, USACE HTRW Center of Expertise, Environmental Engineer
3. Clyde Hopple, USACE, Jacksonville District, Project Engineer
4. Jeff Hitchcock, USACE, Jacksonville District, Project Oversight
5. Larry Sims, RRP Group, Sims & Associates, Geologist
6. David Behnke, Emcon/IT, Operator

This five-year review consisted of the following activities: a review of relevant documents (see Attachment A, Documents Reviewed); interviews with the O&M contractor, a PRP representative, and a site inspection. The completed report will be placed in the local information repository. Notice of its completion will be placed in the local newspaper, and local contacts will be notified by letter.

B. Interviews

Interviews with Mr. David Behnke, on-site operator, and Larry Sims, PRP representative, were conducted by both HTRW Center of Expertise personnel and Jacksonville District personnel listed above. Items discussed during the interviews included project background, operating procedures and operating status. Much of what was learned from Mr. Behnke and Mr. Sims is included in this report. A brief summary of the interviews is provided below.

Mr. Behnke reported that there had been some problems with iron bacteria fouling in the recovery wells, but since the extraction rates are relatively low (5 to 10 gpm) the fouling has not significantly hindered their operation. Total flow rate at the time of the inspection was approximately 84 gpm. Mr. Behnke also explained during his interview that several of the 49 well clusters might be affected by the widening of Forsyth Road to four lanes. Moreover, during the recent construction of a nearby convenience store some of the wells were also damaged.

C. Site Inspection

Representatives of USACE, Sims & Assoc., and Emcon/IT took part in the site inspection. The weather during the inspection was hazy, warm, and humid.

System Layout The groundwater recovery system consists of 13 extraction wells located generally to the east of the site, arranged around the various warehouses and businesses. The wells each have a submersible pump with a design flow rate of 5 or 10 gpm. The water is pumped from the wells through a pipe network of over 18,000 feet of fused underground HDPE pipe to a 1500 gal. equalization tank. The influent water is then pumped to an air stripper unit for final treatment. Off-gas from the air stripper is vented to the atmosphere. The groundwater plume is monitored with a network of 49 monitoring well clusters. Sampling occurs every 6 months in May and again in November. The PRPs have funded the remedial action, however EPA is executing the remedy and has hired the onsite contractor (Emcon/IT) to perform the O&M.

Wells The thirteen (13) extraction wells are approximately 60 feet deep with a 40 foot screen and the submersible pump is located approximately 40 feet below ground surface. The well heads were not inspected during the site inspection as several were located in parking areas and covered by vehicles.

Controls, Pumps, Tanks The extraction and treatment systems are controlled using basic level switches within the equalization tank, wells, and stripper tank. Alarms are provided for high and low levels in the equalization tank, failure of the air stripper pumps and blower, and a low flow condition (i.e. less than 82 gpm). A programmable autodialer notifies the operator on call if a predetermined alarm condition exists which requires immediate on-site operator attention. The 1500 gallon painted steel equalization tank (see photograph) is showing signs of corrosion, and should either be repaired and repainted or eventually the tank could develop a leak and require replacement.

Air Stripper The fiberglass air stripper unit (see photograph) is three (3) feet in diameter, 45 feet tall, and contains 142 cubic feet of Jaeger #3 packing. The air stripper packing is subject to biofouling and requires cleaning at six-month intervals using muratic acid. Biogrowth causes head loss through the stripper, and eventually sloughing into the effluent stream which has resulted in an exceedance in the

suspended solids discharge standard during a monitoring event. The blower inlet (New York Blower Company, 1.5HP model JO6578) for the stripper unit shows signs of corrosion also and should be replaced. The remaining stripper components (piping, valves, and pumps) are in good physical condition. The concrete secondary containment/equipment pad shows signs of surface deterioration in the vicinity where packing / acid washing occurs but has not caused visible cracking or reduction in it's structural integrity.

Other Observations The site was generally neat and clean (see photograph 2). The data collector was operating and the pH was observed to be 6.72. The accesses to the recovery wells and discharge pipe were recently mowed. The treatment system was actively discharging into Crane Strand creek (see photograph 8).

D. Review of Applicable or Relevant and Appropriate Requirements (ARARs)

An ARAR review was performed for the City Industries Site in accordance with the draft EPA guidance document, "Comprehensive Five-Year Review Guidance", EPA 540R-98-050, April 1999. Section 121(d)(2)(A) of CERCLA incorporates into law the CERCLA Compliance Policy, which specifies that Superfund remedial actions meet any Federal standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate requirements (ARARs). Also included is the provision that State ARARs must be met if they are more stringent than Federal requirements.

The requirements of the National Environmental Protection Act (NEPA) have been met. Additionally, the results of these studies were presented to the public through a public notice, and the public was given the opportunity to comment on the results of the studies and the proposed plan for the remedial action.

Documents reviewed for the ARAR analysis:
1. Record of Decision (ROD), March 1990
2. Superfund Remedial Action Report, September 1994

ARAR Identified in the ROD Requiring Review:

1. Groundwater Standards, Criteria and Guidelines as listed in Table 7-1 of the ROD
2. Freshwater Aquatic Life Criteria as listed in Table 7-2 of the ROD
3. NPDES permitting requirements as established in the discharge permit for the site

A copy of the current NPDES permit was not available for review. However, based upon conversation with Jacksonville District personnel, recent sampling data indicates that discharge conditions of the permit are being met. (Note: The NPDES permit is currently up for renewal.)

Surface Water Related ARAR Review:

Site contaminants of concern and their maximum discharge limits were listed in Table 7-1 of the City Industries Site ROD. ROD Standards were based upon federal Ambient Water Quality Criteria (AWQC) and LC-50 values for those contaminants for which federal AWQC values were not established. Per EPA's Five-Year Review Guidance document, old standards are to be compared to new standards to evaluate whether or not the newer standards are more stringent and whether or not the remedy can attain the more stringent standards. Today's AWQC are not regulated federally for the State of Florida. Florida received general NPDES permitting authority in 1994, therefore current State AWQC would be the new standards to be evaluated against the old federal AWQC. In order to identify the appropriate Florida standards, it was first necessary to determine the classification of the surface water system to which the effluent is discharged. Per the guidelines of F.A.C. 62-302.400, Classification of Surface Waters, Usage, Reclassification, Classified Waters, the portion of the Little Econlockhatchee River drainage system associated with the site is classified as a Class III surface water. Therefore, Florida State Class III freshwater surface water standards were identified as the discharge requirements to which to compare the previous standards.

In comparing the original 1990 federal AWQC to the applicable current Florida State AWQC, changes were noted for 5 contaminants. Changes in standards have occurred for benzene, 1,1-dichloroethene (1,1-DCE), methylene chloride, tetrachloroethylene (PCE), and trichloroethylene (TCE). Specific changes are discussed below.

The effluent standard for benzene in the 1990 ROD was listed as 53 micrograms/liter (or parts per billion – ppb). The current Florida Class III surface water standard is 71.28 ppb. The standard for methylene chloride established in the ROD was 1100 ppb, whereas the current Florida standard is1580 ppb. As the two changes to the previous standards were less stringent in nature, no further evaluation is required (Note: The current treatment system is still meeting the previous more stringent standard.)

The Florida effluent standards for 1, 1-DCE, PCE and TCE are more stringent than the criteria originally identified in the ROD. The 1990 standard for 1,1-DCE was 303 ppb whereas the current Florida standard is 3.2 ppb (annual average). The PCE standard changed from 84 ppb to 8.85 ppb and the TCE standard was lowered from 4500 ppb to 80.7 ppb (annual average). When current standards are more stringent than standards established in the ROD, the next step is to evaluate whether or not the treatment system is meeting the more stringent standard. Based upon information provided in recent sampling events, the current treatment system is meeting the more stringent Florida AWQC standards.

Occupational Safety and Health Administration (OSHA)

A health and safety plan was developed during remedial design and was be followed during field activities to assure that regulations of OSHA are followed.

Safe Drinking Water Act (SDWA)

The feasibility study to determine the appropriate clean-up alternative included measures to ensure conformance with the SDWA. The selected remedy assures that drinking water supplied to current well users will meet available MCL's under the SDWA. For those chemicals that do not have assigned MCLs, to-be-considered health-based values will be attained. Discharge from the groundwater treatment system will meet NPDES permit discharge limits under the Clean Water Act (CWA). The CWA is an Applicable requirement, while the SDWA (MCLs) is relevant and appropriate.

Groundwater Related ARAR Review:

The ROD identifies several different groundwater standards as influent standards for the site. The standards are based on the following criteria:

- Reference (RfD) Dose Limits from IRIS
- Florida Primary Drinking Water Standards
- Federal Primary Drinking Water Standards
- Proposed Federal Maximum Contaminant Level Goals (MCLGs)
- USEPA Office of Drinking Water Lifetime Health Advisory risk levels (for $10^{-}6$ risk level)

Cleanup criteria for two site contaminants of concern have changed from the levels established in the 1990 ROD. The changes are for trans 1, 2-DCE and toluene. Several contaminants were added as site chemicals of concern in a post ROD decision and ESD for the site. For one of the additional chemicals of concern (total xylenes), no cleanup criteria was established. Each of these issues will be discussed in further detail below.

The cleanup level for trans 1, 2-DCE was listed in the ROD as 70 ppb. This value was based upon a 1985 proposed MCLG value. Since the signing of the ROD, the MCLG for trans 1, 2-DCE has been finalized as 100 ppb. As the new standard is less stringent than the original standard, no further evaluation is required per EPA's five year review guidance.

The ROD established a cleanup level for toluene at 2000 ppb. This value was also based upon a 1985 proposed MCLG. The proposed MCLG was finalized as 1000 ppb. As this level is more stringent than the previously established level, evaluation as

to whether or not the remedy is attaining the more. stringent standard is required. At this time, that evaluation cannot be done as the treatment of groundwater is still under way and influent levels are still higher than final cleanup criteria.

Total Xylenes were added to the list of chemicals of concern at the site in a 1994 ESD. However, no influent cleanup criteria was established for this contaminant. It is recommended that cleanup criteria be established for Total Xylenes. (Note: There is currently a final MCL for Total Xylenes set at 10,000 ppb.)

National Pollutant Discharge Elimination System (NPDES)

The chosen alternative includes discharge in the Crane Strand Canal; therefore, a NPDES permit is required.

Clean Water Act

Groundwater remediation was aimed at source control, and implementation of the recommended alternative resulted in an end to potential contamination of surface water.

Resource Conservation and Recovery Act (RCRA)

The requirements of RCRA are applicable to RCRA-characterized or listed hazardous wastes (40 CFR Part 261) which were recycled and of disposed at the Site until August, 1983.

Florida Department of Environmental Protection (FDEP) formerly Florida Department of Environmental Regulation (FDER)

Compliance with other environmental laws includes the monitoring of the effluent discharge into the Crane Strand Canal. The monitoring wells were installed to monitor the groundwater quality around the City Industries Superfund Site. The pump and treat system was design to operate at the City Industries Superfund Site for 10 years.

General ARAR Related Protectiveness Summary:

Currently, the remedy is protective as pertains to ARAR related issues. The treatment system is meeting current surface water discharge limits, even those more stringent limits established by the post-ROD. Established cleanup criteria meets current standards with the exception of toluene, however, there is no reason to believe the system can not meet the more stringent toluene standard.

E. Groundwater Data Review

General In order to track movement and removal of the groundwater

contamination plume, initially quarterly monitoring was conducted at the Site from Aug 1994 through Feb 1998. Forty-one (41) wells are sampled quarterly and an additional twenty (20) wells are sampled annually. To assist in the review and comprehension of the quarterly sampling results, twelve different chemical concentration distribution maps were prepared each quarter; six for wells screened in the intermediate zone of the aquifer (30 to 40 feet below ground surface (bgs)) and six for wells screened in the deep zone of the aquifer (50 to 60 feet bgs).

Groundwater Data for quarterly sampling events between Aug 1994 - May 1996 and Aug 1996 - Feb 1998 can be found by reviewing the following information:

1. For sampling quarter's one (1) through eight (8) see Interim LTRA Report appendices.
2. For sampling quarter's nine (9) through fifteen (15) see Second Interim LTRA Report appendices.

A review of the 1996-1998 contaminant maps for each contaminant category indicates that the plume has been contained. The highest concentration contours in the intermediate zone are between the two lines of wells near MW-221 and MW-431; this is also the area where groundwater contours show a divide between flow to the first group and flow to the second group of wells. The highest concentration contours in the deep zone are near the first group of recovery wells, near R-5. No significant differences were found between different contaminant group maps. Overall contaminant level have decreased.

Groundwater Data for semi-annual sampling events between 1998-1999 can be found by reviewing the following information:

1. For 1st, 2nd, & 3rd semi-annual sampling events and Whole Chronic Toxicity Test Results see Monthly Reports.

VI. Assessment

The following conclusions support the determination that the remedy at the City Industries Site remains protective of human health and the environment:

Effectiveness of Remedy

As noted above, the pump and treat system has achieved containment of the contaminants. However, the pumping configuration needs to be adjusted to increase the concentration of contaminants pumped to the treatment system and to draw contaminants out of stagnant zones that appear to exist between well groups. EPA should continue to evaluate the pumping scheme and pursue changes that optimize cleanup costs and reduce cleanup time.

Adequacy of O&M

O&M procedures are consistent with requirements. No recent significant difficulties have occurred to date.

Early Indicators of Potential Remedy Failure

No early indicators of potential remedy failure were noted during the review. O&M costs and maintenance activities have been consistent with expectations.

VII. Deficiencies

Several deficiencies were discovered during the five-year review. It is unlikely that these deficiencies are significant enough to affect protectiveness.

The monitoring well clusters located near Forsyth Road may be or have already been damaged due to the Forsyth Road expansion (widening to four lanes).

The 1500 gallon painted steel equalization tank is showing signs of corrosion and should be repaired or replaced.

The site is protected by an 8 foot high security fence. However, there have been some problems with vandalism, as the on-site trailer has been broken into and some equipment and supplies were stolen. No damage occurred to the treatment system.

No cleanup level has been established for Total Xylenes.

VIII. Recommendations

The following recommendations are made to address the deficiencies noted above:

(1). Consider abandoning any extraction and/or monitoring wells deemed unnecessary or permanently damaged. Currently there are no extraction wells and/or monitoring wells under consideration for abandonment at this time.

(2). Consider reducing the sampling/monitoring frequency at several of the wells. Note the overall monitoring frequency of all wells has recently been reduced by EPA Region IV from quarterly monitoring to semi annual monitoring in 1998.

(3). Consider performing a detailed maintenance inspection of the 1500 gallon equalization tank.

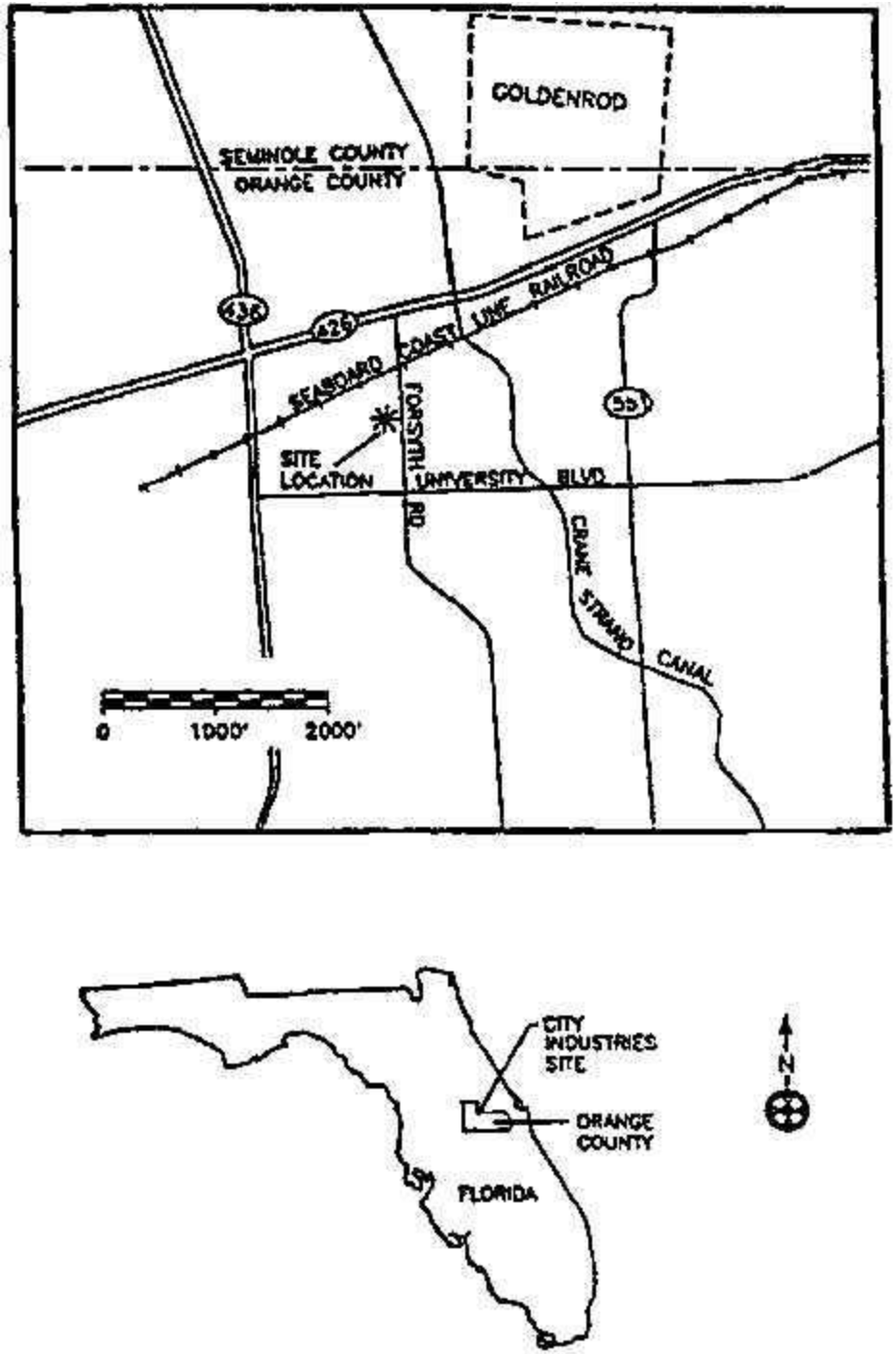
(4). Consider establishing a cleanup level for Total Xylenes.

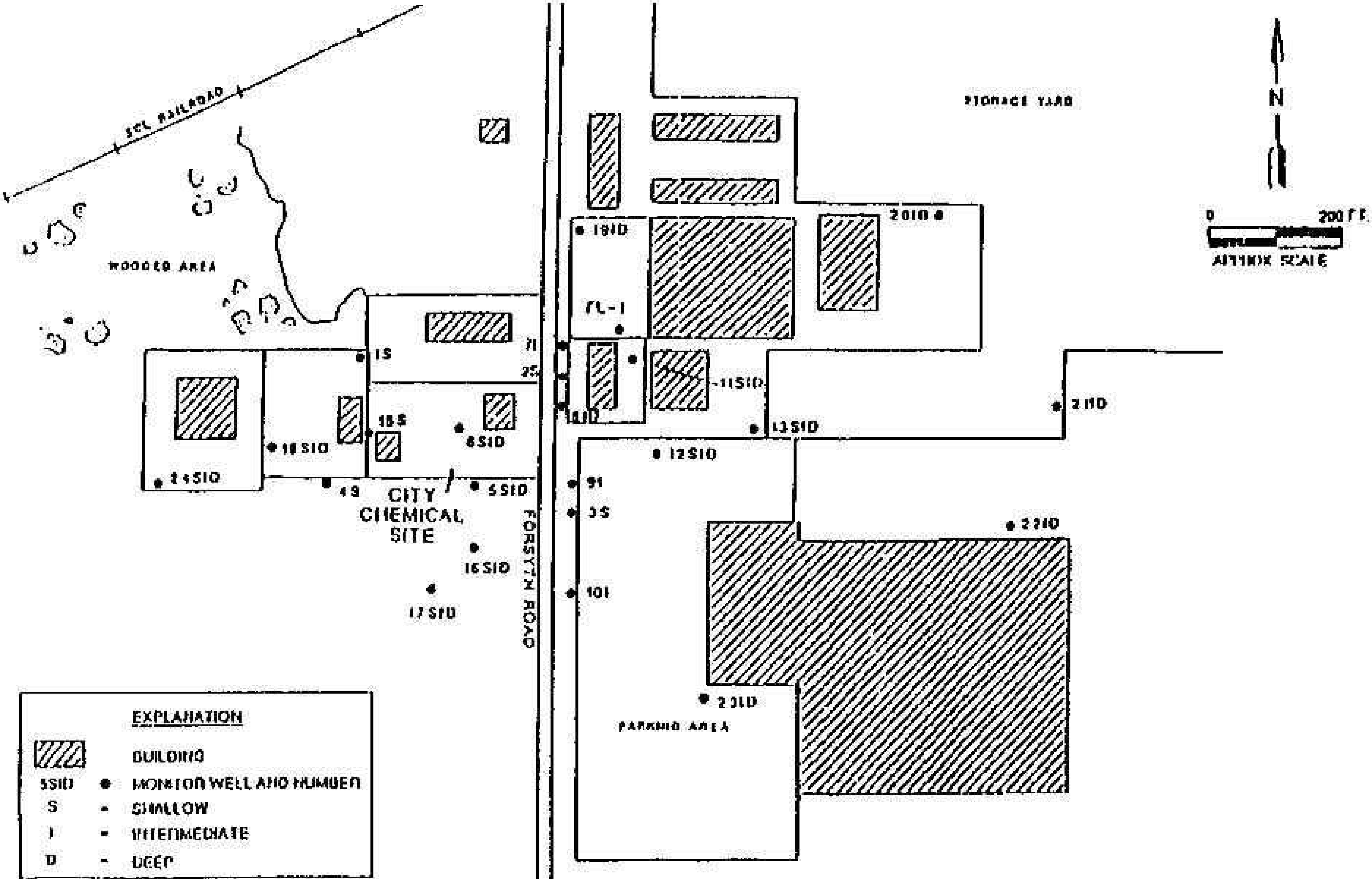
IX. Protectiveness Statement

The remedies at the City Industries Site remain protective of human health and the environment. The pump and treat system appears to be effective at containing contaminants. Effluent is being discharge in accordance with the O&M Manual. Institutional controls at the Site remain in place and are effective.

X. Next Review

This is a policy site that requires ongoing five-year reviews. EPA will conduct the next review within five years of the completion of this first five-year review report.


GOLDENROD
SEMINOLE COUNTY
ORANGE COUNTY
436
426
SEABOARD COAST LINE RAILROAD
FORSYTH RD
SITE LOCATION
UNIVERSITY BLVD
CRANE STRAND CANAL
0
1000'
2000'
CITY INDUSTRIES SITE
ORANGE COUNTY
FLORIDA
N


SCL RAILROAD
WOODED AREA
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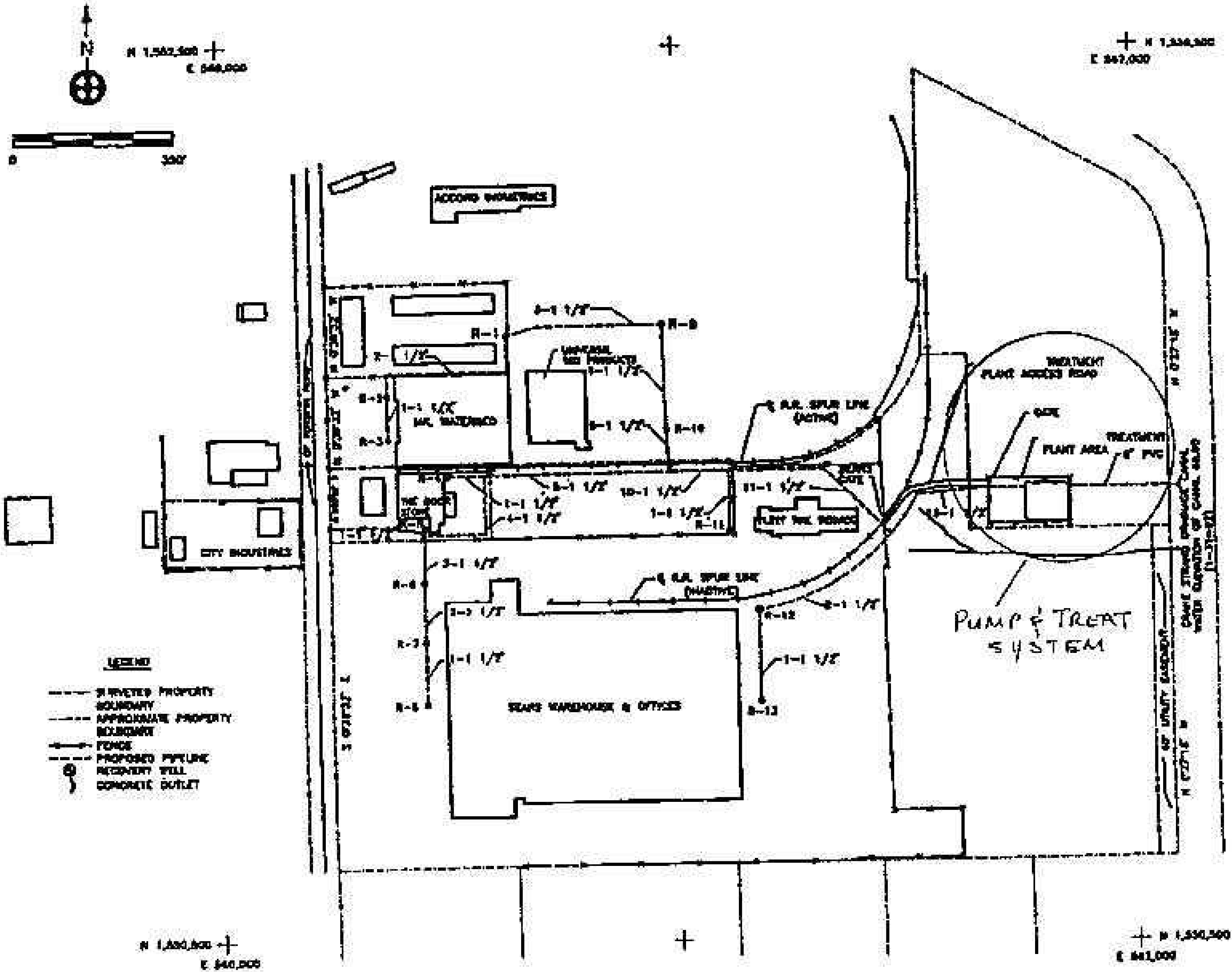
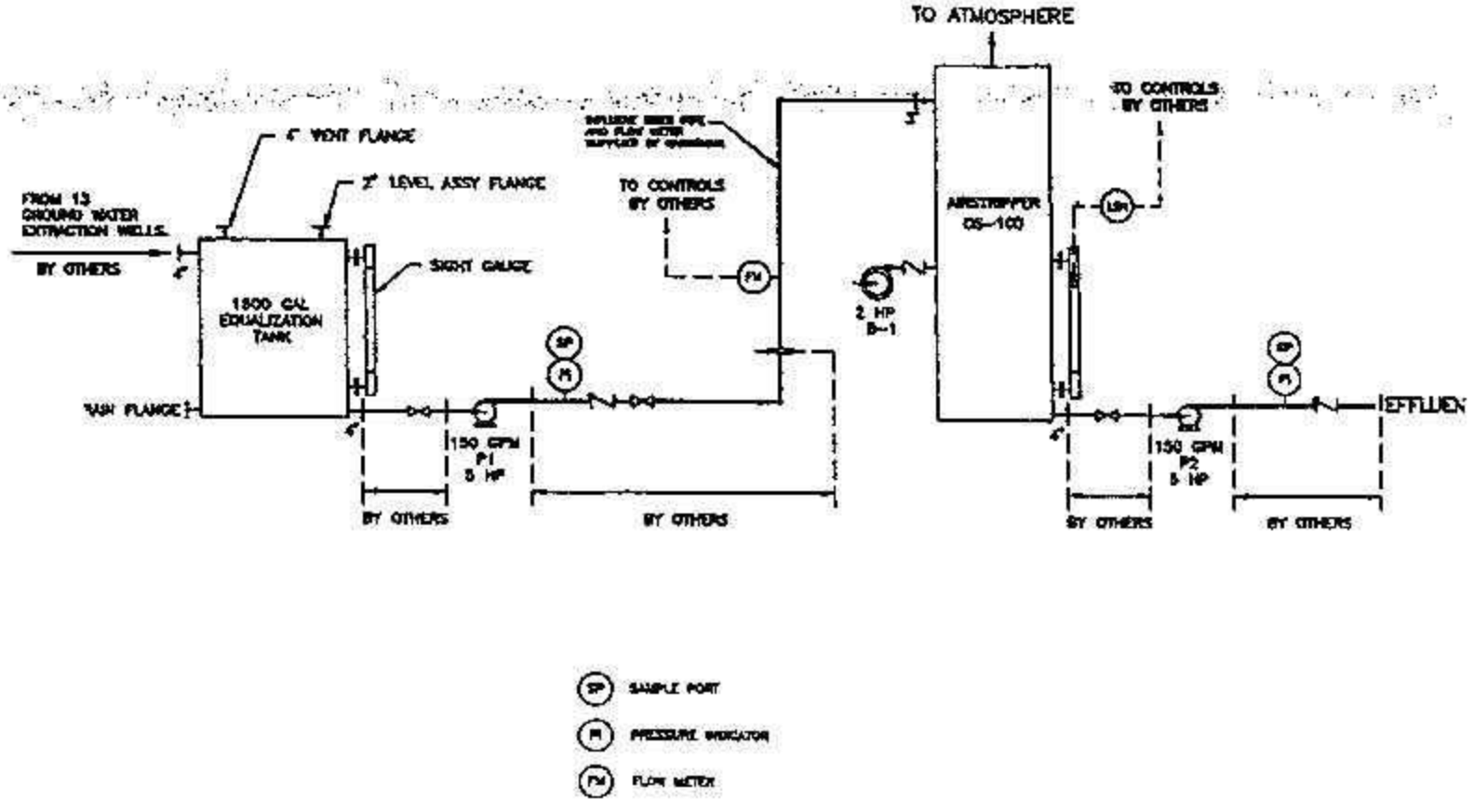
200 FT.
CITY CHEMICAL SITE
FORSYTH ROAD
1 S
18 S
8 SID
19 SID
24 SID
4 S
5 SID
16 SID
17 SID
12 SID
13 SID
11 SID
PL-1
9 I
3 S
10 I
EXPLANATION
BUILDING
5SID
MONITOR WELL AND NUMBER
S
SHALLOW
I
INTERMEDIATE
D
DEEP


N
ACCORD INDUSTRIES
CITY INDUSTRIES
SEARS WAREHOUSE & OFFICES
TREATMENT PLANT ACCESS ROAD
GATE
TREATMENT PLANT AREA
PUMP & TREAT SYSTEM
LEGEND
SURVEYED PROPERTY BOUNDARY
APPROXIMATE PROPERTY BOUNDARY
FENCE
PROPOSED PIPELINE
RECOVERY WELL
CONCRETE OUTLET


TO ATMOSPHERE
4" VENT FLANGE
2" LEVEL ASSY FLANGE
FROM 13 GROUND WATER EXTRACTION WELLS BY OTHERS
1500 GAL EQUALIZATION TANK
SIGHT GAUGE
TO CONTROLS BY OTHERS
AIRSTRIPPER OS-100
TO CONTROLS BY OTHERS
2 HP B-1
VENT FLANGE
150 GPM P1 5 HP
150 GPM P2 5 HP
EFFLUEN
BY OTHERS
BY OTHERS
BY OTHERS
BY OTHERS
SAMPLE PORT
PRESSURE INDICATOR
FLOW METER

Tables

TABLE 1.
INFLUENT CLEANUP CONCENTRATIONS AND EFFLUENT DISCHARGE CRITERIA FOR THE TARGET ORGANIC COMPOUNDS

Target Compound	Influent Cleanup Criteria (µg/L)	Effluent Discharge Criteria (µg/L)
Acetone	700	88,000
Benzene	1	53
1,1-Dichloroethane	5	1,160
1,1-Dichloroethene	7	303
c-1, 2-Dichloroethene	70	1,160
t-1, 2-Dichloroethene	70	1,160
Ethyl Benzene	700	453
Methylene Chloride	5	1,100
Methyl Ethyl Ketone	200	56,400
Methyl Isobutyl Ketone	350	42,800
Tetrachloroethene	3	84
Toluene	2,000	175
1,1,1-Trichloroethane	200	530
Trichloroethene	3	4,500
Total Phthalates	3	-
Vinyl Chloride	1	525
Xylenes, total	-	260

TABLE 2.
NPDES DISCHARGE LIMITATIONS

Parameter	Discharge Limitations	
	Monthly Average	**Daily Average**
Flow, (MGD)	Report	Report
BOD^5, mg/l	5.0	8.0
Ammonia as (N), mg/1	1.0	1.60
Total Nitrogen, as (N), mg/1	3.0	4.80
Total Phosphorus, as (P), mg/l	1.0	1.60
pH, standard units	shall not be less than 6.0 nor greater than 8.5	
Dissolved Oxygen	shall not be less than 6.0 mg/l	
Chronic Whole Effluent Toxicity	NOEC concentration must be >100% effluent	

TABLE 3.
AMBIENT AIR LIMITATIONS FOR TARGET CONTAMINANTS

Parameter	Acceptable Ambient Conc. (mg/m^3)
Acetone	8.47
Benzene	0.072*
1,1-Dichloroethane	1.93
1,1-Dichloroethene	0.05
t-1,2-Dichloroethene	1.89
Ethyl Benzene	1.03
Methylene Chloride	0.41
Methyl Ethyl Ketone	1.41
Methyl Isobutyl Ketone	0.49
Tetrachloroethene	0.81
Toluene	1.80
1,1,1-Trichloroethane	9.09
Trichloroethene	0.64
Xylenes	1.03

* Emission requirement for benzene was modified to match state 24-hour ambient air requirement, since detection limit was often higher that standard originally in design.

TABLE 4.
AIR POLLUTION CONTROL REQUIREMENTS

Parameter	Limit
Volatile Organic Compounds	1) 10 tons/year for proposed sources 2) 3 lb/hr or 15 lb/day for actual sources
HCL Particulates	33 µg/m^3 ambient 1) 50 µg/m^3 annual arithmetic mean ambient at boundary 2) 150 µg/m^3 24 hour average - ambient at boundary
Carbon Monoxide	1) 1 hour concentration of 35 ppm - at boundary 2) 8 hour concentration of 9 ppm - at boundary
Sulfur Dioxide	1) 3 hour concentration of .05 ppm - at boundary 2) 24 hour concentration of .1 ppm - at boundary 3) Annual arithmetic mean of .02 ppm - at boundary

COE Oversight Costs

The U.S. Army Corps of Engineers oversight costs are detailed in Table 7 and amount to a total cost of $207,340.05 to March 1998. Mr. Andy Adams, Mr. Ron Rutger, or Mr. Jeff Hitchcock went to the Site approximately 1-2 days per month to observe operations, maintenance activities, and sampling during the O&M phase of the project.

TABLE 5
U.S. ARMY CORPS OF ENGINEERS
OVERSIGHT COSTS

Cost Description	Construction Oversight	Amount Base Period	Amount Option #1	Amount Option #2
Regular Labor	$69,288.05	$18,065.73	$6,864.04	$12,046.40
Overtime Labor	$1,178.03			
Department Overhead	$4,886.08	$512.29	$1,040.76	$3,118.00
Indirect Cost	$8,396.22	$317.29		
Per Diem & Transportation	$587.66	$3,957.10	$1,028.48	$222.75
Supplies & Materials	$260.55	$73.84		
All Other Costs	$48.15	$439.34		
Other Government Agencies				
Rent & Utilities	$481.00	$884.33		
Contracts	$45.00	$345.00	$234.69	
Motor Vehicle Charges	$12,209.55	$683.03		
Plant & Equipment	$709.06			
District Overhead	$21,326.21	$5,230.65	$1,617.31	$5,117.40
Area Office Overhead	$20,060.72	$4,370.82	$1,491.04	$170.88
TOTAL	$139,476.28	$34,912.02	$12,276.32	$20,675.43

City Industries Superfund Site
Site Photographs

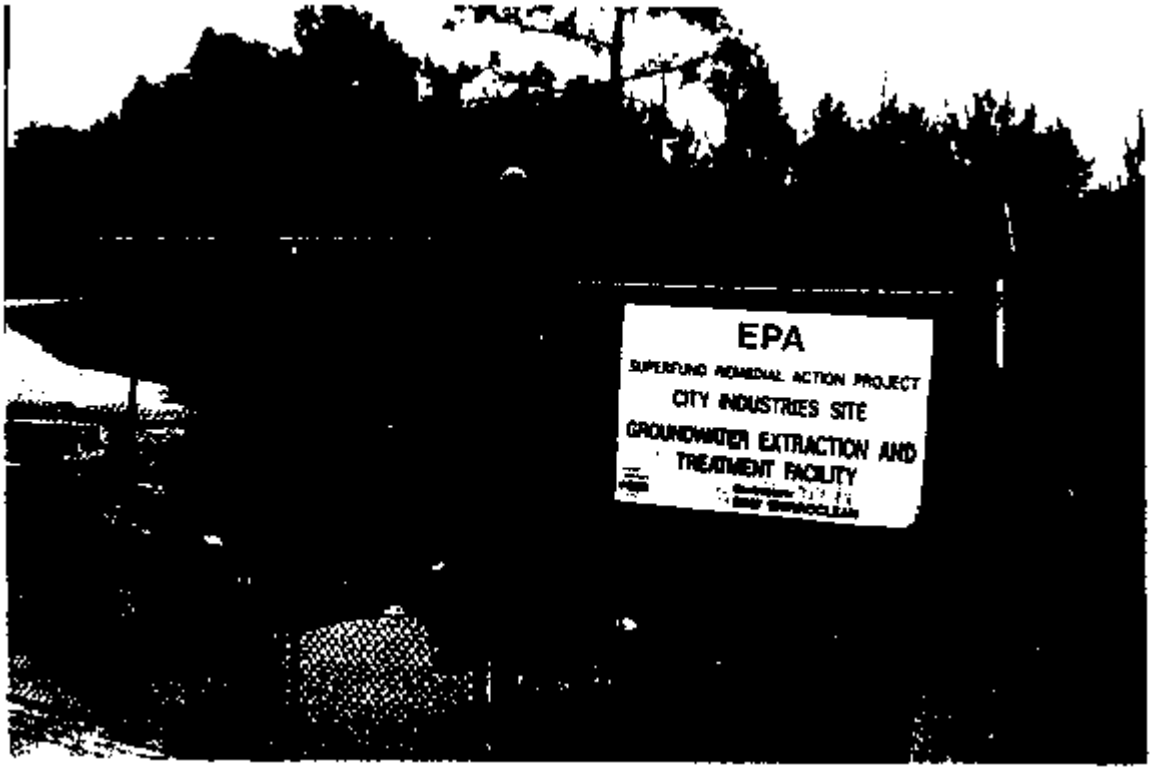


Photo 1 – Entrance Road into Groundwater Extraction and Treatment Facility

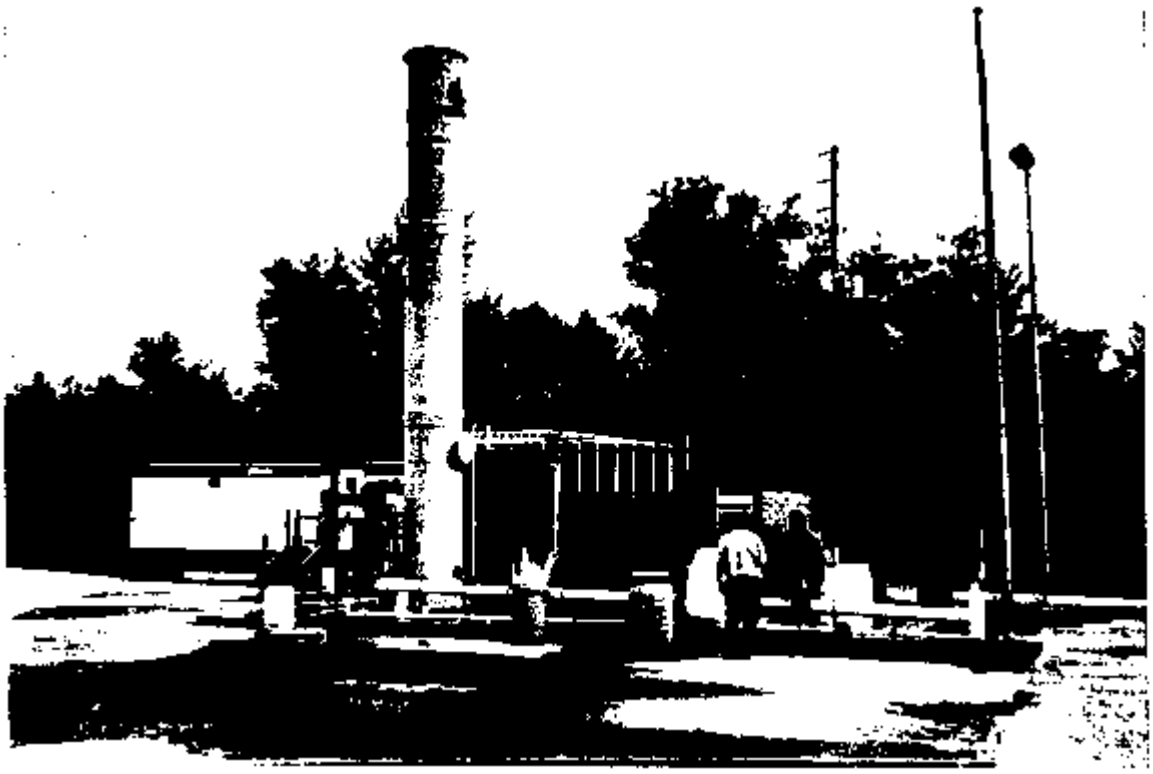


Photo 2 – View of Treatment Facility, Concrete Pad, On-Site Trailer

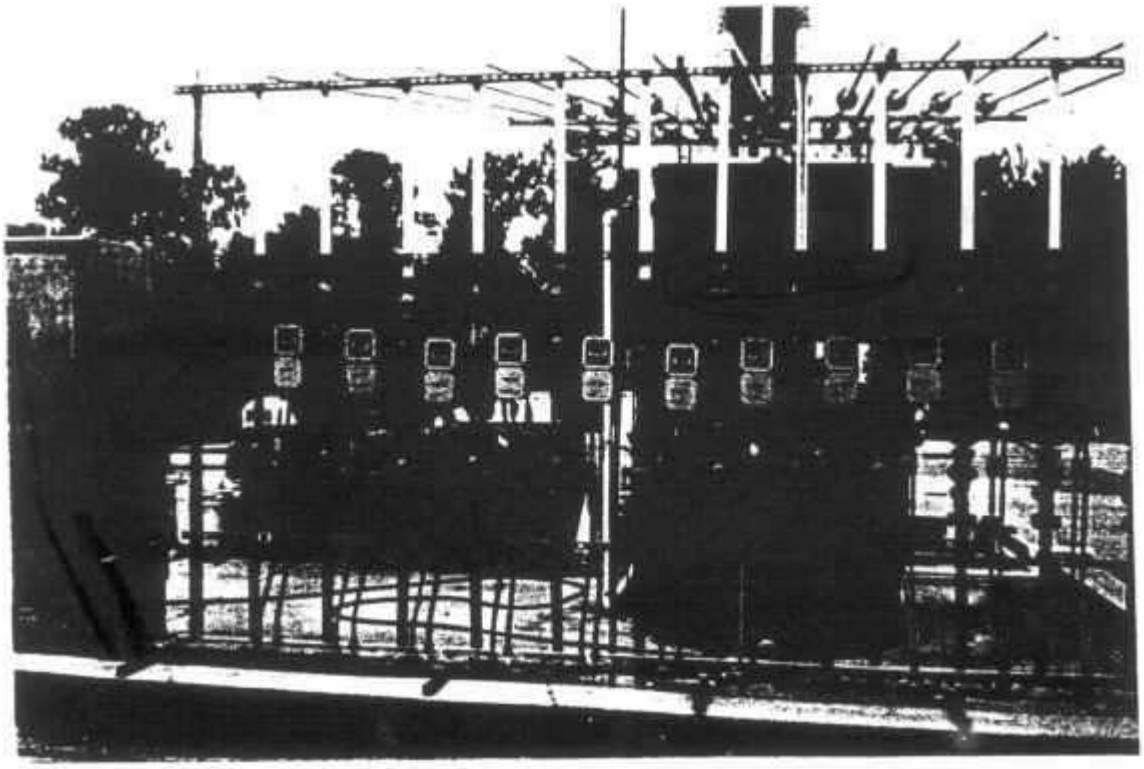


Photo 3 – View of Thirteen (13) Groundwater Extraction Wells

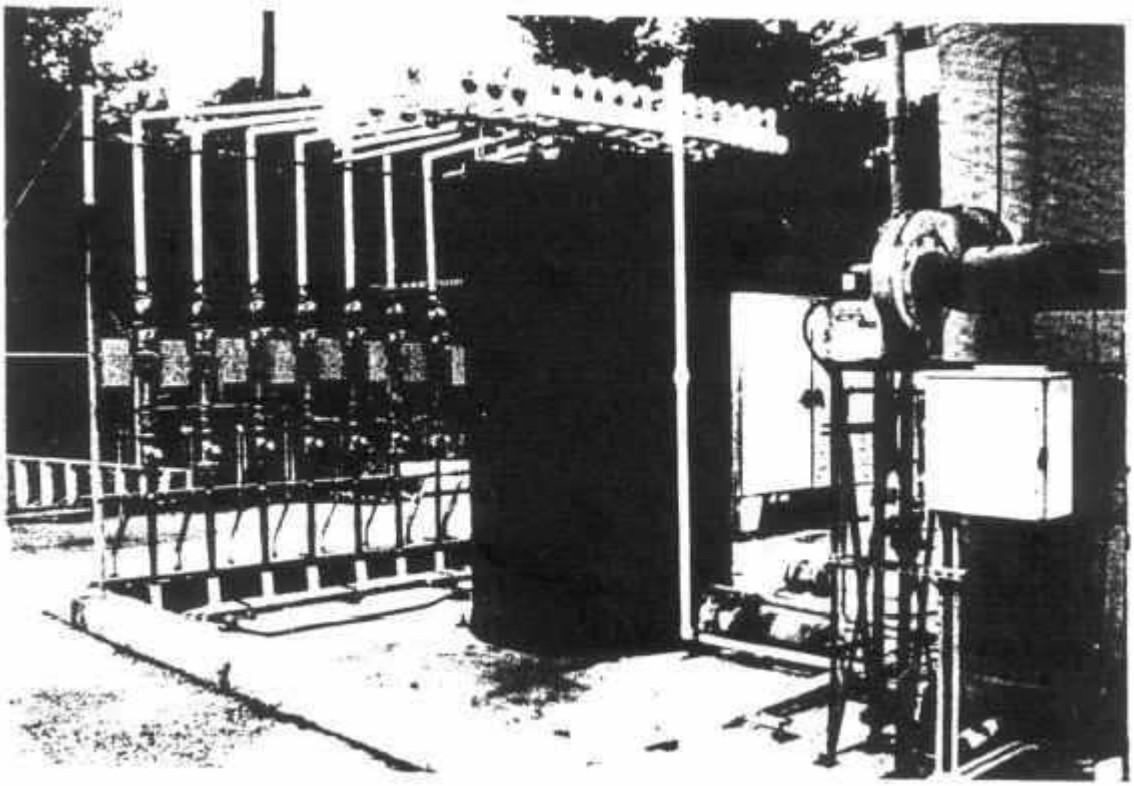


Photo 4 – View of extraction Wells And 1500 gal. Equalization Tank

Photo 5 – View of Air Stripping Tower Media and Cleaning Area

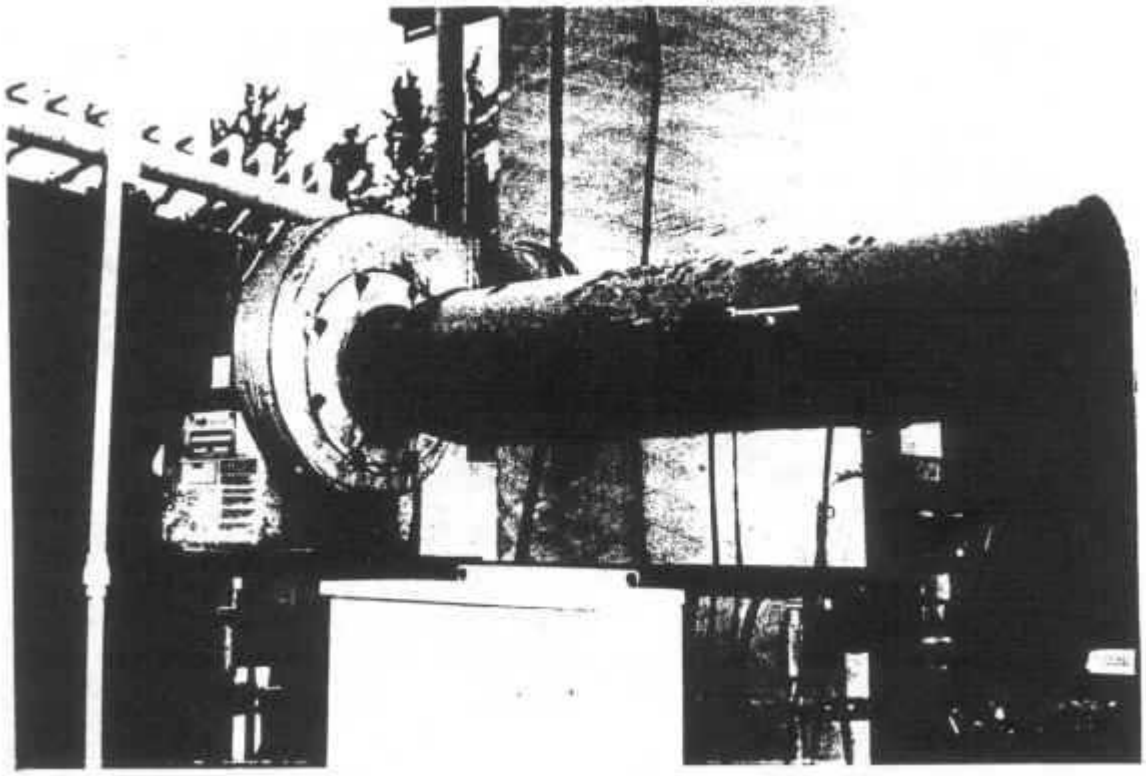


Photo 6 – View of 2 HP Air Intake

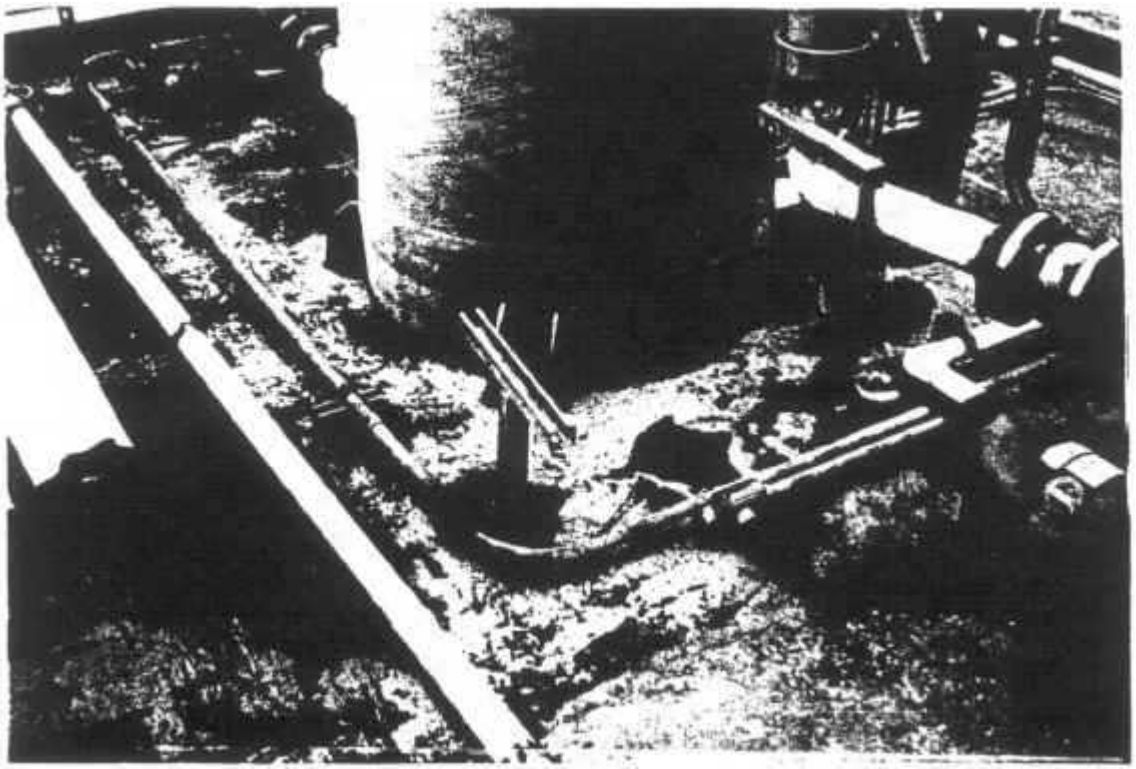


Photo 7 – View of Valves, 5 HP pumps, and Air Stripper Tower Base Slab

Photo 8 – View of Treated Effluent Flowing from Pipe into Crane Strand Canal

Attachment A

Documents Reviewed

Administrative Settlement and Consent Decree, City Industries Superfund Site, Winter Park, Orange County, Florida, April 1987– September 1990.

Record of Decision, ROD Decision Summary, City Industries Superfund Site, Winter Park, Orange County, Florida, March 1990.

Final Design Report, City Industries Superfund Site, Winter Park, Orange County, Florida, March 1992.

Final Remedial Action Report, City Industries Superfund Site, Winter Park, Orange County, Florida, September 1994.

Operations and Maintenance Plan, 100% Completion, May 1994

Revised Operations and Maintenance Plan, November 1996

Interim Long -Term Response Action Report, City Industries Superfund Site, January 1997

Second Interim Long -Term Response Action Report, City Industries Superfund Site, October 1998

Monthly Reports, City Industries Superfund Site, Winter Park, Orange County, Florida Jan 1998 through May 1999

Structure and Components of Five-Year Reviews, EPA, May 23, 1991.

Draft OSWER Directive 9355.7-03B-P, Comphrensive Five-Year Review Guidance, April 1999

Attachment B

Site Inspection Checklist

Please note that "O&M" is referred to throughout this document. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

Five-Year Review Site Inspection Checklist (Template)

(Working document for site inspection. Information may be completed by hand and attached to the five-year review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION

Site name: CITY INDUSTRIES	Date of inspection: 29 JUNE 1999
Location and Region: WINTER PARK FL., 04	EPA ID: FLD055945653
Agency, office or company leading the five-year review: USACE – JAX (CESAJ-EN-GH)	Weather/temperature: WARM HUMID / CLOUDY

Remedy Includes (Check all that apply)
- ☐ Landfill cover/containment
- ☑ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other _____

☑ Inspection team roster attached ☑ Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M site manager DAVID BLINKE (Name) ON SITE TECHNICAN (Title) 6/29/99 (Date)
   Interviewed ☑ at site ☑ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

2. O&M staff _____ (Name) _____ (Title) _____ (Date) N/A
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

3. Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

4. Other interviews (optional) ☐ Report attached.

LARRY S. SIMS, P.G.
ENVIRONMENTAL CONSULTANT for PRP.

III. ONSITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Manual and As-Builts** ☑ Readily available ☑ Up to date ☐ N/A
   ☑ As-builts ☑ Readily available ☑ Up to date ☐ N/A
   ☑ Maintenance Logs ☑ Readily available ☐ Up to date ☐ N/A
   Remarks all documents including diskette of monitoring data were available

2. **Site Specific Health and Safety Plan** ☑ Readily available ☐ Up to date ☐ N/A
   ☑ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A
   Remarks

3. **O&M and OSHA Training Records** ☑ Readily available ☐ Up to date ☐ N/A
   Remarks

4. **Permits and Service Agreements**
   ☐ Air discharge permit ☐ Readily available ☐ Up to date ☑ N/A
   ☑ Effluent discharge ☐ Readily available ☐ Up to date ☐ N/A under review
   ☐ Waste disposal, POTW ☐ Readily available ☐ Up to date ☑ N/A
   ☐ Other permits ☐ Readily available ☐ Up to date ☐ N/A
   Remarks Surface Water Discharge – Ambient Water Quality – Effluent gamma discharge concentrations.

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☑ N/A
   Remarks

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☑ N/A
   Remarks

7. **Groundwater Monitoring Records** ☑ Readily available ☐ Up to date ☐ N/A
   Remarks

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☑ N/A
   Remarks

9. **Discharge Compliance Records**
   ☐ Air ☐ Readily available ☐ Up to date ☐ N/A
   ☑ Water (effluent) ☑ Readily available ☑ Up to date ☐ N/A
   Remarks

10. **Daily Access/Security Logs**
☐ Readily available ☐ Up to date ☑ N/A
Remarks _____

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☑ Contractor for PRP
☐ Other _____

2. **O&M Cost Records**
☑ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate _____ ☐ Breakdown attached

$562/day @ beginning
Currently 340/day + $124K/yr

Approx – Total annual cost by year for review period if available

From _____ To _____ 90'–150K ☐ Breakdown attached
Dates Total cost

From _____ To _____ _____ ☐ Breakdown attached
Dates Total cost

From _____ To _____ _____ ☐ Breakdown attached
Dates Total cost

From _____ To _____ _____ ☐ Breakdown attached
Dates Total cost

From _____ To _____ _____ ☐ Breakdown attached
Dates Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: Packing material (see photo) in air stripper requires cleaning and change out on 6 month intervals due to high iron bacteria build up. Pumps also require cleaning – caused by iron bacteria fouling.

V. GENERAL SITE CONDITIONS

Whenever possible, actual site conditions should be documented with photographs.

A. Fencing

1. Fencing damaged ☐ Location shown on site map ☑ Gates secured ☐ N/A
Remarks fenced area was in good condition. Some vandalism problems — supplies equipment stolen from field trailer (see photos)

B. Site Access

1. Access restrictions, signs, other security measures ☒ Location shown on map ☐ N/A
Remarks sign were posted

C. Perimeter Roads

1. Roads damaged ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks

D. General

1. Vandalism/trespassing ☐ Location shown on site map ☑ No vandalism evident
Remarks David recalled vandalism of his office trailer & some equipment (computer) was stolen.

2. Land use changes onsite ☑ N/A
Remarks

3. Land use changes offsite ☑ N/A
Remarks Forsyth Road will be changed to 4 lanes. Monitoring wells damaged during construction of "C" store

4. Institutional controls (site conditions imply institutional controls not being enforced) ☐ N/A
Agency
Contact
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached

VI. LANDFILL COVERS ☐ Applicable ☑ Not applicable

A. Landfill Surface

1. Settlement (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent Depth
Remarks

2. Cracks ☐ Location shown on site map ☐ Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks_____

3. Erosion ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. Holes ☐ Location shown on site map ☐ Holes not evident
Areal extent_____ Depth_____
Remarks_____

5. Vegetative Cover ☐ Grass ☐ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks_____

6. Alternative Cover (armored rock, concrete, etc.) ☐ N/A
Remarks_____

7. Bulges ☐ Location shown on site map ☐ Bulges not evident
Areal extent_____ Height_____
Remarks_____

8. Wet Areas/Water Damage ☐ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☐ Ponding ☐ Location shown on site map Areal extent_____
☐ Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks _____

9. Slope Instability ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent_____
Remarks_____

B. Benches ☐ Applicable ☐ Not applicable
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

C. **Letdown Channels** ☐ Applicable ☐ Not applicable
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map
☐ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. **Cover Penetrations** ☐ Applicable ☐ Not applicable

1. Gas Vents ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning
☐ Routinely sampled ☐ Good condition ☐ Needs O&M ☐ Evidence of leakage at penetration
☐ N/A
Remarks_____

2. **Gas Monitoring Probes** ☐ Properly secured/locked ☐ Functioning
☐ Routinely sampled ☐ Good condition ☐ Needs O&M ☐ Evidence of leakage at penetration
☐ N/A
Remarks_____

3. Monitoring Wells (within surface area of landfill) ☐ Properly secured/locked
☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Needs O&M
☐ Evidence of leakage at penetration ☐ N/A
Remarks_____

4. **Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning
☐ Routinely sampled ☐ Good condition ☐ Needs O&M
☐ Evidence of leakage at penetration ☐ N/A
Remarks_____

5. Settlement Monuments ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs O&M
Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs O&M
Remarks_____

F. Cover Drainage Layer ☐ Applicable ☐ Not applicable

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ Not applicable

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
☐ Siltation not evident
Remarks_____

2. **Erosion** Areal extent_____ Depth_____
☐ Erosion not evident
Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
Remarks_____

H. Retaining Walls ☐ Applicable ☐ Not applicable

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ Not applicable

1. Siltation ☐ Location shown on site map ☐ Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. Vegetative Growth ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. Erosion ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. Discharge Structure ☐ Functioning ☐ N/A
Remarks_____

VII. VERTICAL BARRIER WALLS ☐ Applicable ☑ Not applicable

1. Settlement ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. Performance Monitoring Type of monitoring_____
☐ Performance not monitored
Frequency_____ ☐ Evidence of breaching
Remarks_____

VIII. GROUNDWATER/SURFACE WATER REMEDIES ☑ Applicable ☐ Not applicable

A. Groundwater Extraction Wells, Pumps, and Pipelines
☑ Applicable ☐ Not applicable

1. **Pumps, Wellhead Plumbing, and Electrical**
☑ Good condition ☑ All required wells located ☐ Needs O&M ☐ N/A
Remarks – flush mount vaults

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☑ Good condition ☐ Needs O&M
Remarks – 4 wells no longer pumping (1, 2, 8, 9) recovery 9 in service. Total flow rate ≈ 84-100 gpm

B. **Surface Water Collection Structures, Pumps, and Pipelines**
☐ Applicable ☒ Not applicable

1. NA **Collection Structures, Pumps, and Electrical**
☑ Good condition ☐ Needs O&M
Remarks

2. NA **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☑ Good condition ☐ Needs O&M
Remarks

C. **Treatment System** ☑ Applicable ☐ Not applicable

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☑ Air stripping ☐ Carbon adsorbers
☐ Filters ☑ Others equalization
☑ Good condition ☐ Needs O&M
☒ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☒ Quantity of groundwater treated annually 84-100 gpm (≈ 42 Mg/yr)
☐ Quantity of surface water treated annually
Remarks EPA receives monthly reports all equipment outdoor.

2. **Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A (photos)
☑ Good condition ☐ Needs O&M
Remarks Some corrosion on panel due to constant moisture/humidity present in Florida.

3. **Tanks, Vaults, Storage Vessels** ☐ N/A photos
☐ Good condition ☑ Proper secondary containment ☑ Needs O&M
Remarks Corrosion present on metal tankarm (500 gal SS tank) and blower inlet. Concrete degradation due to acid spillage in area where stripper packing material is acid washed

4. **Discharge Structure and Appurtenances** ☐ N/A
☑ Good condition ☐ Needs O&M
Remarks _____

5. **Treatment Building(s)** ☑ N/A
☐ Good condition ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks all equipment outdoors

6. **Monitoring Wells (pump and treatment remedy)** ☐ Properly secured/locked
☑ Functioning ☑ Routinely sampled ☐ Good condition ☐ All required wells located
☐ Needs O&M ☐ N/A
Remarks May be able to abandon some of the MW's due to reduction in plume size.

D. Monitored Natural Attenuation

i. **Monitoring Wells (natural attenuation remedy)** ☐ Properly secured/locked
☐ Functioning ☐ Routinely sampled
☐ Good condition ☐ All required wells located ☐ Needs O&M ☑ N/A
Remarks _____

IX. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

X. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Remedy is to provide containment of the contaminant plume and to provide treatment of the groundwater recovered to maintain containment by containment plume.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

O&M at the site appears to be adequate at this time.

C. Early Indicators of Potential Remedy Failure

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

- abandon unnecessary wells (extraction)
- reduce number of MW's sampled and the frequency
* either optimize the wells used for plume containment to include only those most contaminated or bypass the air stripper
- if air stripper is kept in service, reduce sampling frequency for compliance verification / annual database validation

* based on current discharge standards, the stripper system influent concentrations is below the discharge standards

III. ONSITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Manual and As-Builts** ☒ Readily available ☒ Up to date ☐ N/A
   ☒ As-builts ☒ Readily available ☒ Up to date ☐ N/A
   ☒ Maintenance Logs ☒ Readily available ☐ Up to date ☐ N/A
   Remarks _____

2. **Site Specific Health and Safety Plan** ☒ Readily available ☐ Up to date ☐ N/A
   ☒ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A
   Remarks _____

3. **O&M and OSHA Training Records** ☒ Readily available ☐ Up to date ☐ N/A
   Remarks _____

4. **Permits and Service Agreements**
   ☐ Air discharge permit ☐ Readily available ☐ Up to date ☒ N/A
   ☒ Effluent discharge ☐ Readily available ☒ Up to date ☐ N/A - Under review.
   ☐ Waste disposal, POTW ☐ Readily available ☐ Up to date ☒ N/A
   ☐ Other permits _____ ☐ Readily available ☐ Up to date ☐ N/A
   Remarks - Surface Water Discharge - Ambient Water Qual. Standards. Gaseous discharge concentrations

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A
   Remarks _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A
   Remarks _____

7. **Groundwater Monitoring Records** ☒ Readily available ☐ Up to date ☐ N/A
   Remarks _____

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A
   Remarks _____

9. **Discharge Compliance Records**
   ☐ Air ☐ Readily available ☐ Up to date ☐ N/A
   ☒ Water (effluent) ☒ Readily available ☒ Up to date ☐ N/A
   Remarks _____

10. **Daily Access/Security Logs**
☐ Readily available ☐ Up to date ☒ N/A
Remarks _____

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☒ Contractor for PRP
☐ Other _____

2. **O&M Cost Records**
☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate _____ ☐ Breakdown attached

$562/day at beginning
currently $340/day = $124,110/year

Approx. Total annual cost by year for review period if available

From _____ To _____ _____ ☐ Breakdown attached
Dates Total cost

From _____ To _____ _____ ☐ Breakdown attached
Dates Total cost

From _____ To _____ _____ ☐ Breakdown attached
Dates Total cost

From _____ To _____ _____ ☐ Breakdown attached
Dates Total cost

From _____ To _____ _____ ☐ Breakdown attached
Dates Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: Packing in air stripper requires cleaning and change out on 6 month intervals due to iron bacteria building. Pumps also require cleaning - covered by air backwashing failing.

V. GENERAL SITE CONDITIONS
Whenever possible, actual site conditions should be documented with photographs.

A. Fencing

1. Fencing damaged ☐ Location shown on site map ☒ Gates secured ☐ N/A
Remarks Some Vandalism Problems — Supplies + equipment stolen from trailer.

B. Site Access

1. Access restrictions, signs, other security measures ☒ Location shown on map ☐ N/A
Remarks

C. Perimeter Roads

1. Roads damaged ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks

D. General

1. Vandalism/trespassing ☐ Location shown on site map ☐ No vandalism evident
Remarks — Vandals broke into trailer + stole equipment and supplies.

2. Land use changes onsite ☒ N/A
Remarks

3. Land use changes offsite ☒ N/A
Remarks — Forsyth Road will be going to 4 lanes. Monitoring wells damaged during construction of "CH Site"

4. Institutional controls (site conditions imply institutional controls not being enforced) ☐ N/A
Agency
Contact
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached

VI. LANDFILL COVERS ☐ Applicable ☒ Not applicable

A. Landfill Surface

1. Settlement (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent Depth
Remarks

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
Areal extent_____ Depth_____
Remarks_____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
Remarks_____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
Areal extent_____ Height_____
Remarks_____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☐ Ponding ☐ Location shown on site map Areal extent_____
☐ Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent_____
Remarks_____

B. **Benches** ☐ Applicable ☐ Not applicable
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

C. **Letdown Channels** ☐ Applicable ☐ Not applicable
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map
☐ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ☐ Applicable ☐ Not applicable

1. **Gas Vents** ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning
☐ Routinely sampled ☐ Good condition ☐ Needs O&M ☐ Evidence of leakage at penetration
☐ N/A
Remarks_____

2. **Gas Monitoring Probes** ☐ Properly secured/locked ☐ Functioning
☐ Routinely sampled ☐ Good condition ☐ Needs O&M ☐ Evidence of leakage at penetration
☐ N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill) ☐ Properly secured/locked
☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Needs O&M
☐ Evidence of leakage at penetration ☐ N/A
Remarks_____

4. **Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning
☐ Routinely sampled ☐ Good condition ☐ Needs O&M
☐ Evidence of leakage at penetration ☐ N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs O&M
Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs O&M
Remarks_____

F. Cover Drainage Layer ☐ Applicable ☐ Not applicable

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ Not applicable

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
☐ Siltation not evident
Remarks_____

2. **Erosion** Areal extent_____ Depth_____
☐ Erosion not evident
Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
Remarks_____

H. Retaining Walls ☐ Applicable ☐ Not applicable

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ Not applicable

1. Siltation ☐ Location shown on site map ☐ Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. Vegetative Growth ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. Erosion ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. Discharge Structure ☐ Functioning ☐ N/A
Remarks_____

VII. VERTICAL BARRIER WALLS ☐ Applicable ☒ Not applicable

1. Settlement ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. Performance Monitoring Type of monitoring_____
☐ Performance not monitored
Frequency_____ ☐ Evidence of breaching
Remarks_____

VIII. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ Not applicable

A. Groundwater Extraction Wells, Pumps, and Pipelines
☒ Applicable ☐ Not applicable

1. **Pumps, Wellhead Plumbing, and Electrical**
☐ Good condition ☒ All required wells located ☐ Needs O&M ☐ N/A
Remarks — Flush mount vaults

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☒ Good condition ☐ Needs O&M
Remarks — 4 wells no longer pumping leaving 13 in service
Total flow rate ~ 84gpm

B. Surface Water Collection Structures, Pumps, and Pipelines
☐ Applicable ☒ Not applicable

1. **Collection Structures, Pumps, and Electrical**
N/A
☒ Good condition ☐ Needs O&M
Remarks —

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
N/A
☒ Good condition ☐ Needs O&M
Remarks

C. Treatment System ☒ Applicable ☐ Not applicable

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☒ Air stripping ☐ Carbon adsorbers
☐ Filters ☒ Others Equalization
☐ Good condition ☐ Needs O&M
☒ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☒ Quantity of groundwater treated annually 84gpm (44MG/yr)
☐ Quantity of surface water treated annually
Remarks All equipment outdoors

2. **Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A
☐ Good condition ☐ Needs O&M
Remarks Some Corrosion on panels due to constant moisture/humidity present @ Florida Dk

3. **Tanks, Vaults, Storage Vessels** ☐ N/A
☐ Good condition ☐ Proper secondary containment ☒ Needs O&M
Remarks Corrosion present on metal tankage (original EQ tank) and blower inlet. Concrete degradation due to acid spillage in area where stripper packing is acid washed

4. **Discharge Structure and Appurtenances** ☐ N/A
☒ Good condition ☐ Needs O&M
Remarks _____

5. **Treatment Building(s)** ☒ N/A
☐ Good condition ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks All equipment out doors

6. **Monitoring Wells (pump and treatment remedy)** ☐ Properly secured/locked
☒ Functioning ☒ Routinely sampled ☐ Good condition ☐ All required wells located
☐ Needs O&M ☐ N/A
Remarks – May be able to abandon some of the wells due to reduction in plume size

D. Monitored Natural Attenuation

1. **Monitoring Wells (natural attenuation remedy)** ☐ Properly secured/locked
☐ Functioning ☐ Routinely sampled
☐ Good condition ☐ All required wells located ☐ Needs O&M ☐ N/A
Remarks _____

IX. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

X. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Remedy is to provide containment of the contaminant above and to provide treatment of the ground water withdrawn to maintain plume capture.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

O&M at the site appears to be adequate at this time.

C. Early Indicators of Potential Remedy Failure

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None noted.

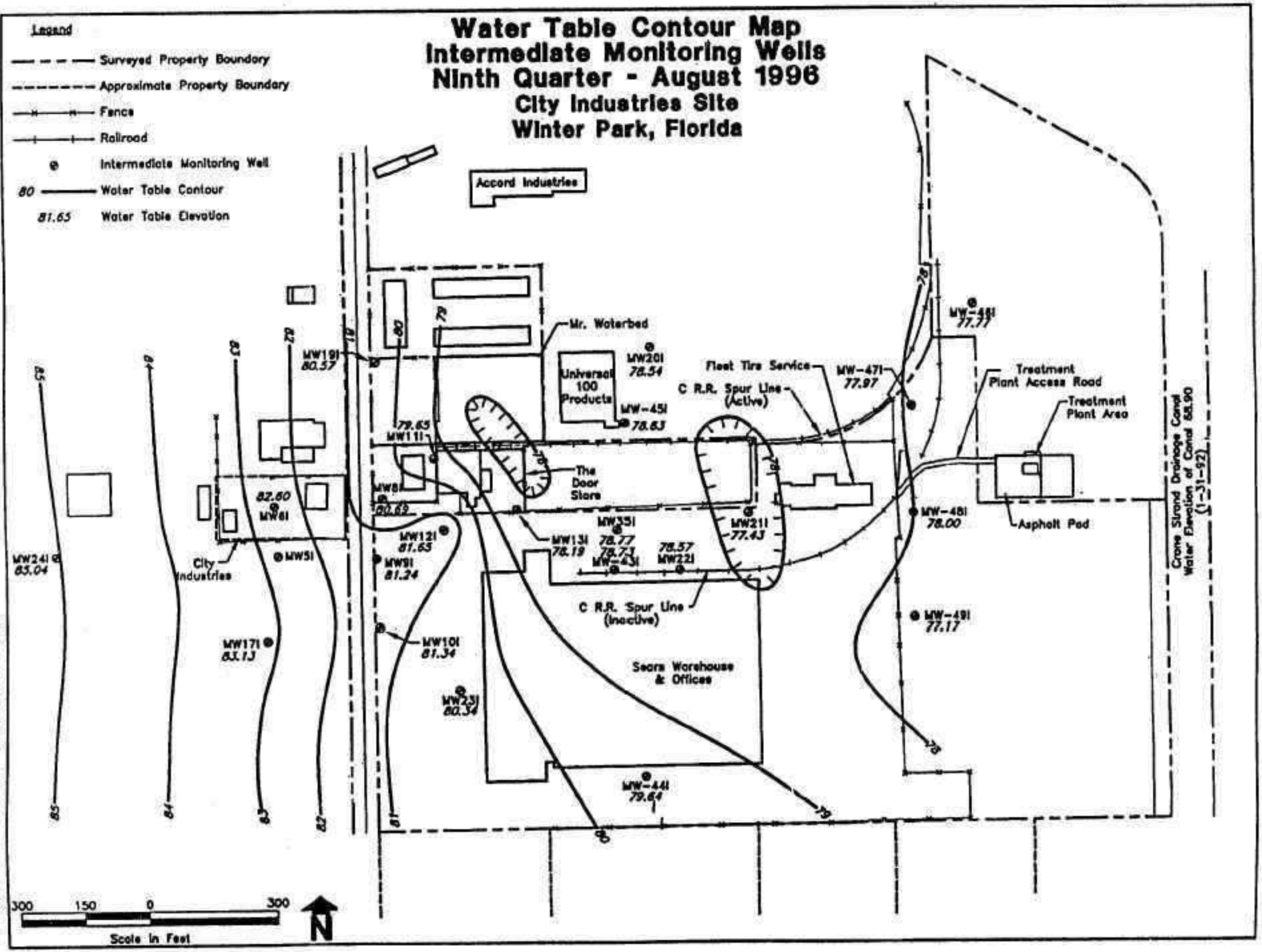
D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

- Abandon unnecessary wells (extraction)
- Reduce number of wells sampled (monitoring) and frequency.
- Based on current discharge standards, the stripper system influent concentration is below the discharge standards.
  a. either optimize the wells used for plume containment to include only those not contaminated or
  b. bypass the air stripper
- If the stripper is kept in service, reduce sampling frequency for compliance verification of discharge stds

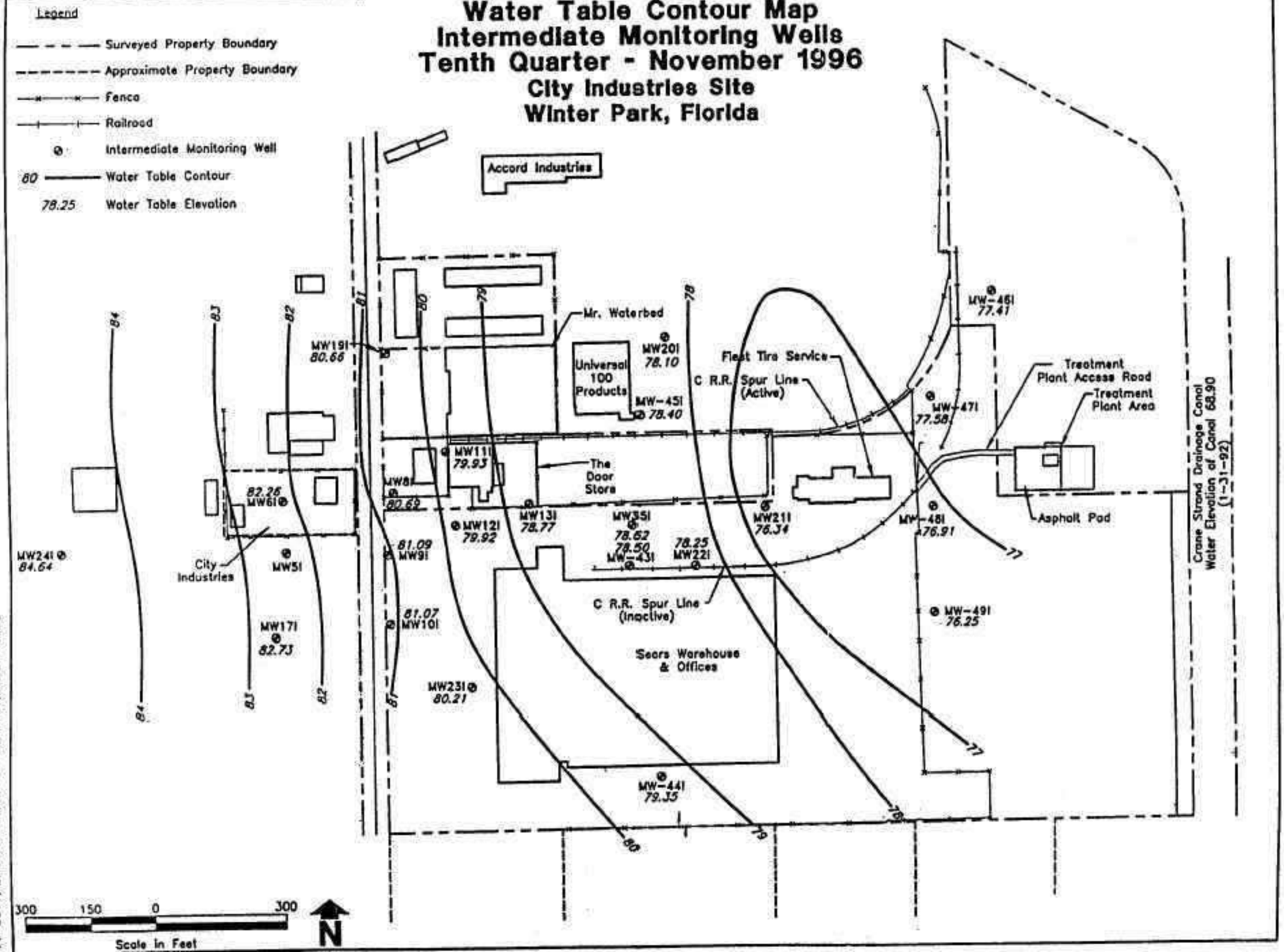
Attachment C

Groundwater Contour Maps



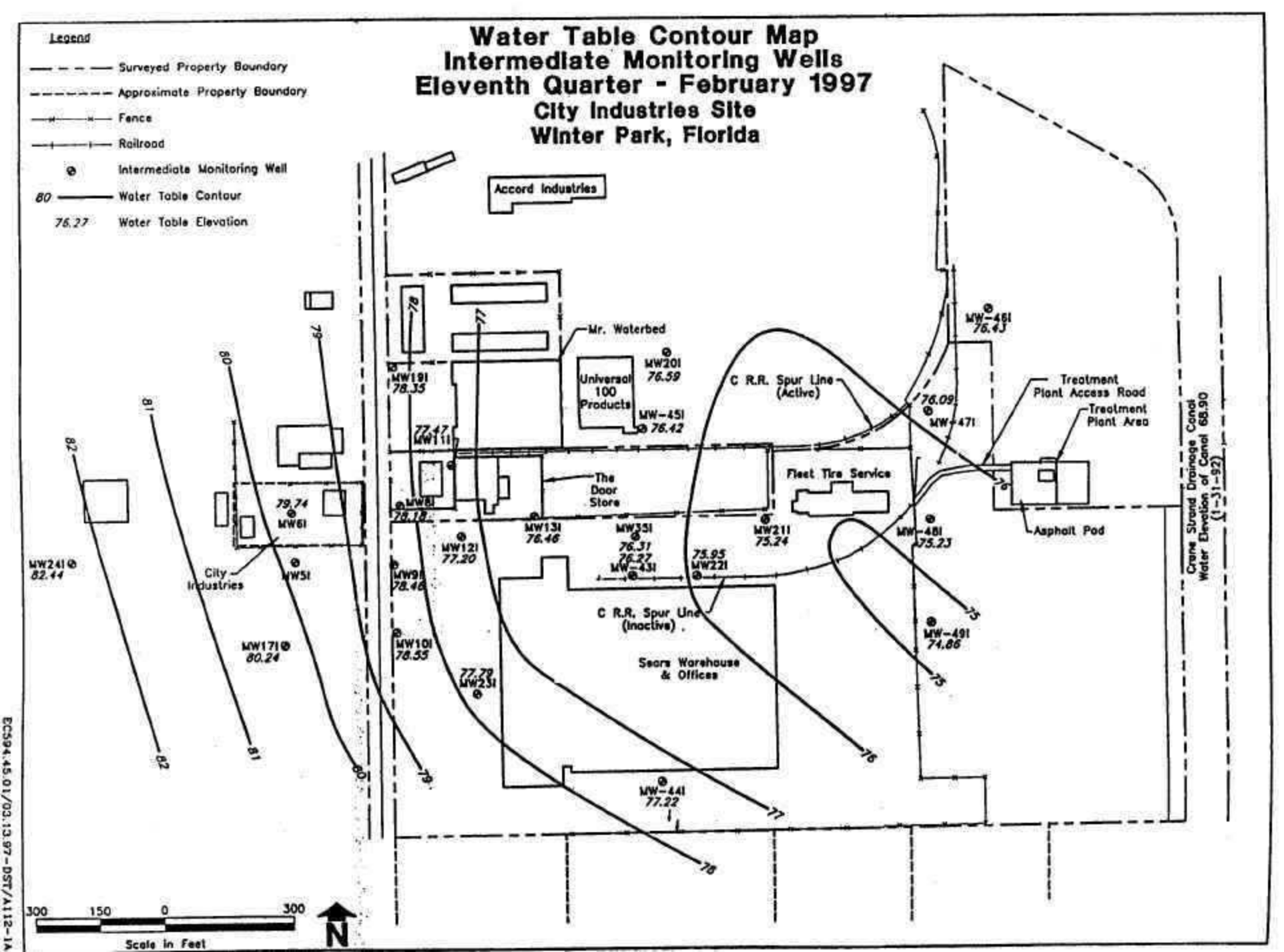
EC594.45.01/11.18.96-MKD/11.26.96-DST/A10A-1A

Water Table Contour Map
Intermediate Monitoring Wells
Tenth Quarter - November 1996
City Industries Site
Winter Park, Florida

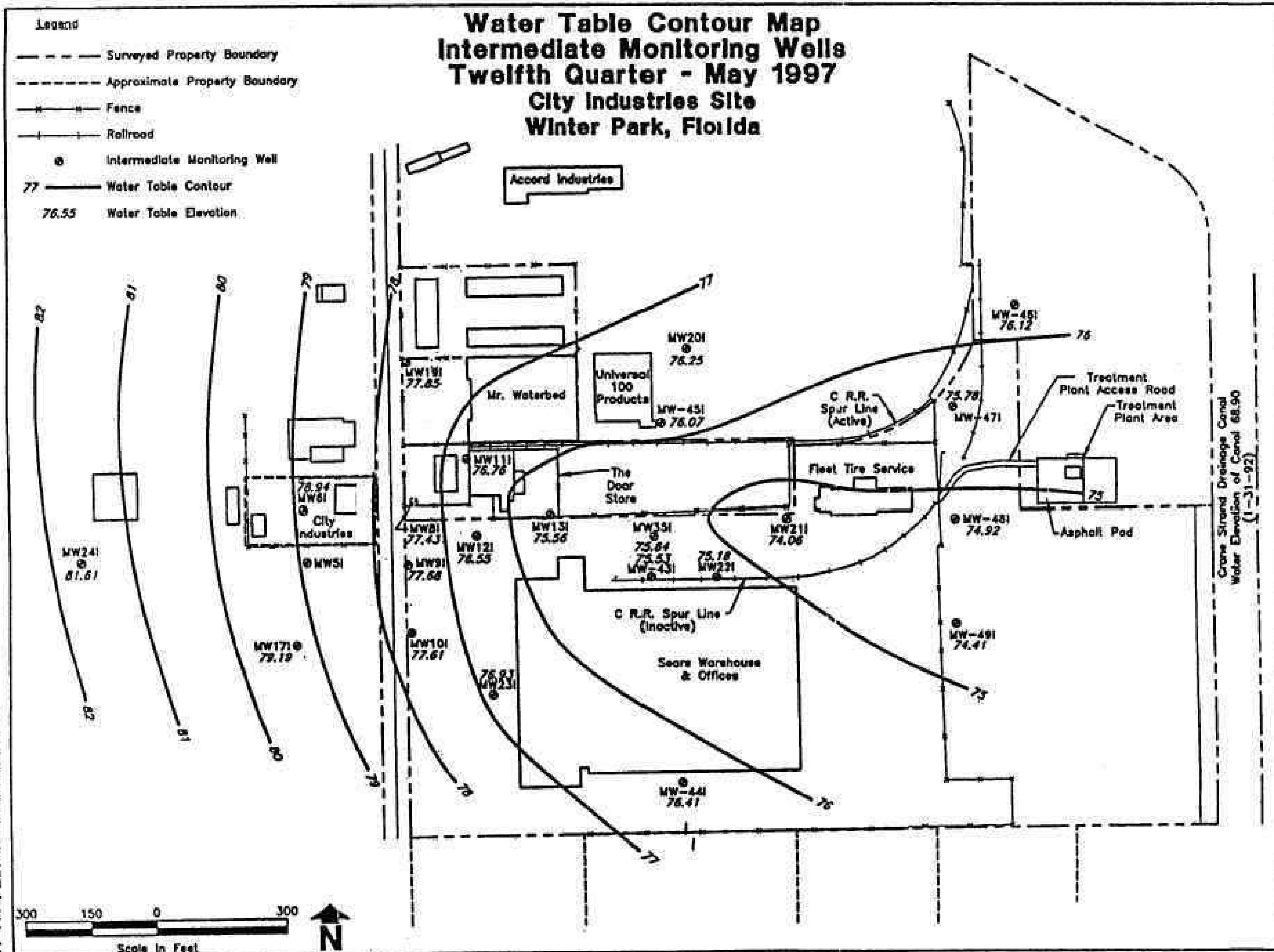


EC594.45.01/03.12.97-DST/03.31.97-CMP/A109-1A

Water Table Contour Map
Intermediate Monitoring Wells
Eleventh Quarter - February 1997
City Industries Site
Winter Park, Florida

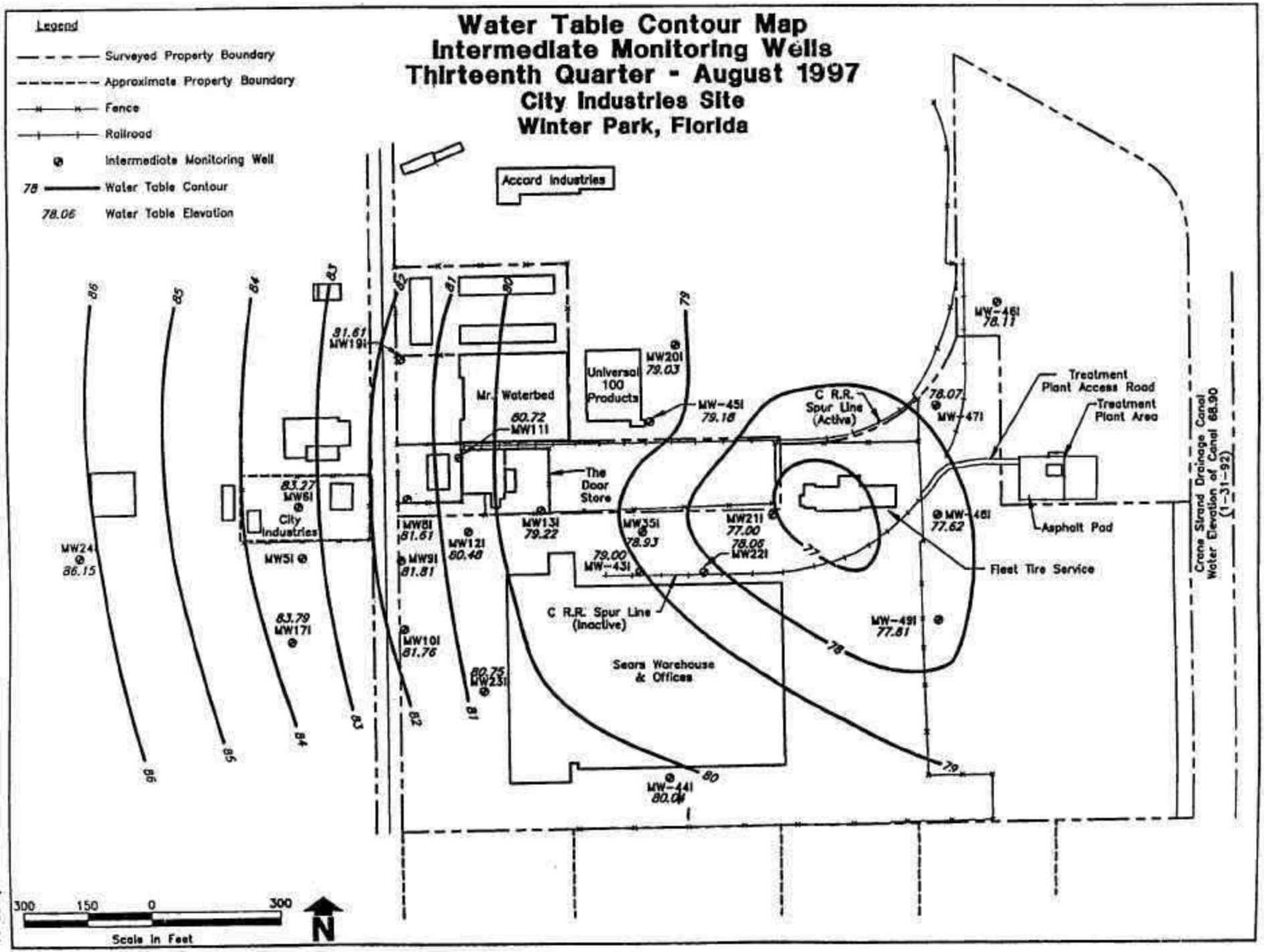


EC594.45.01/03.13.97-DST/A112-1A



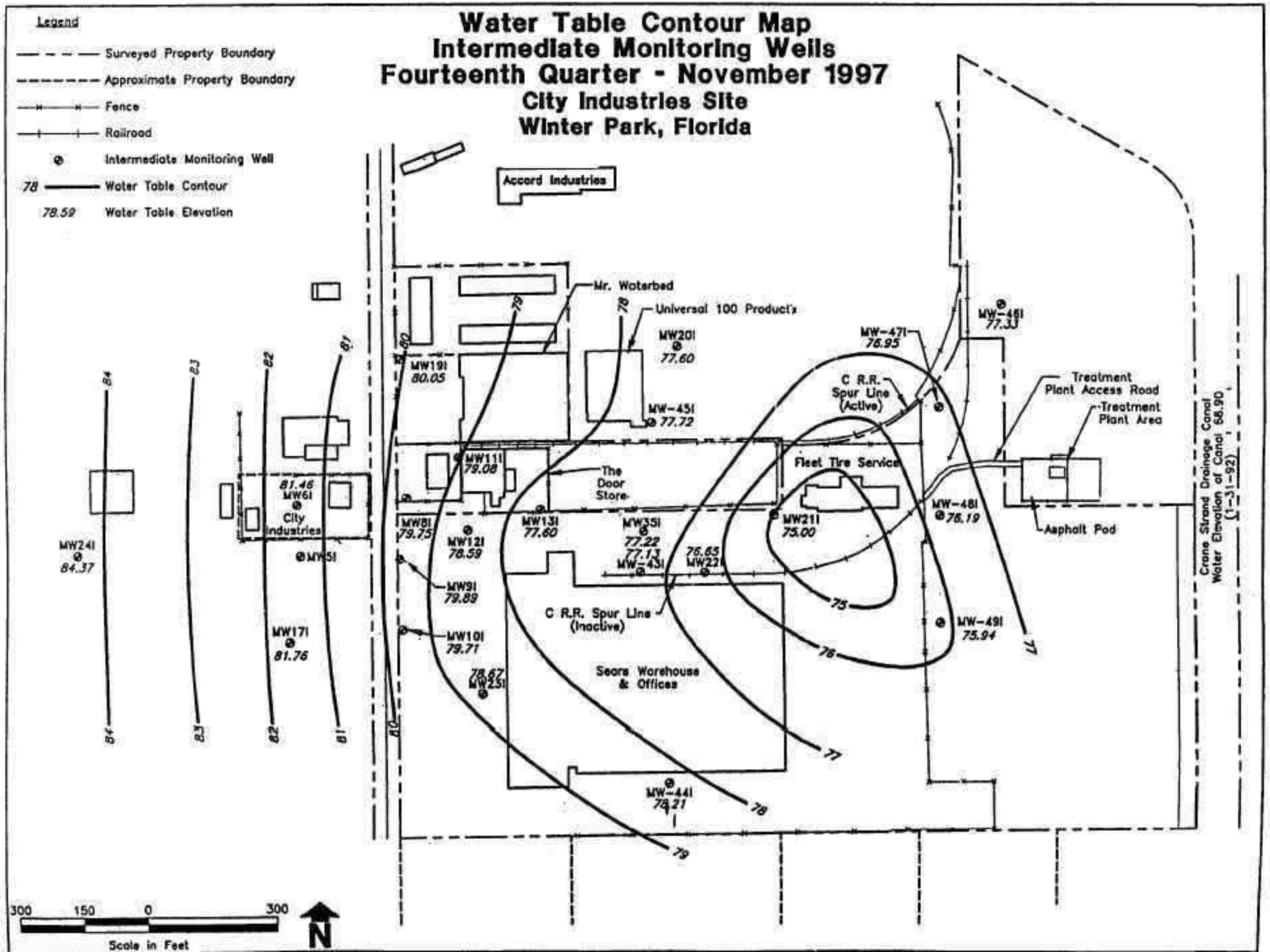
ECSR4.45.01/09.17.97-MXB/A114-1A

Water Table Contour Map
Intermediate Monitoring Wells
Thirteenth Quarter - August 1997
City Industries Site
Winter Park, Florida

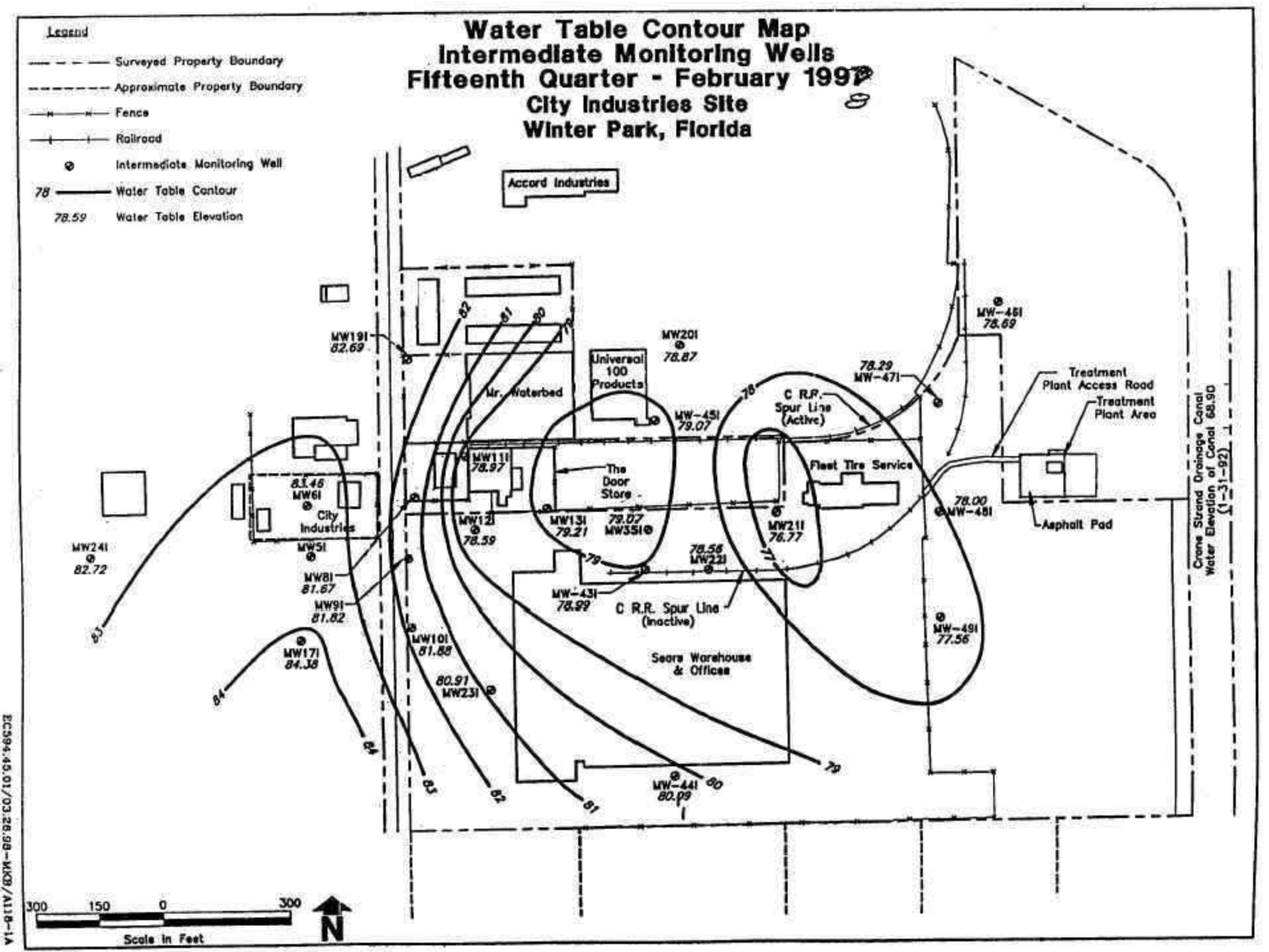


EC594.45.01/03.25.98-MKB/A122-1A

Water Table Contour Map
Intermediate Monitoring Wells
Fourteenth Quarter - November 1997
City Industries Site
Winter Park, Florida

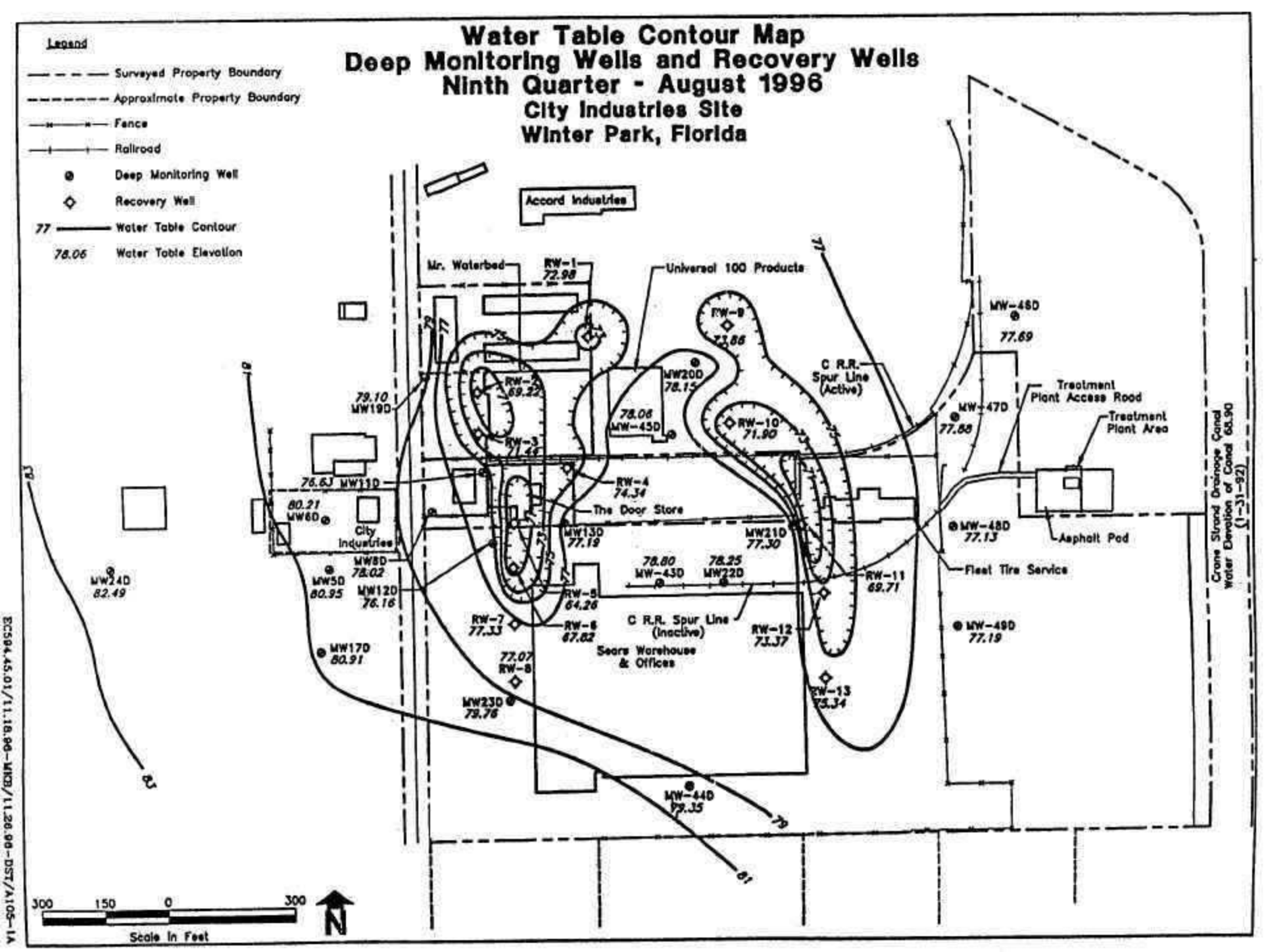


EC594.45.01/03.26.98-MKB/A120-1A



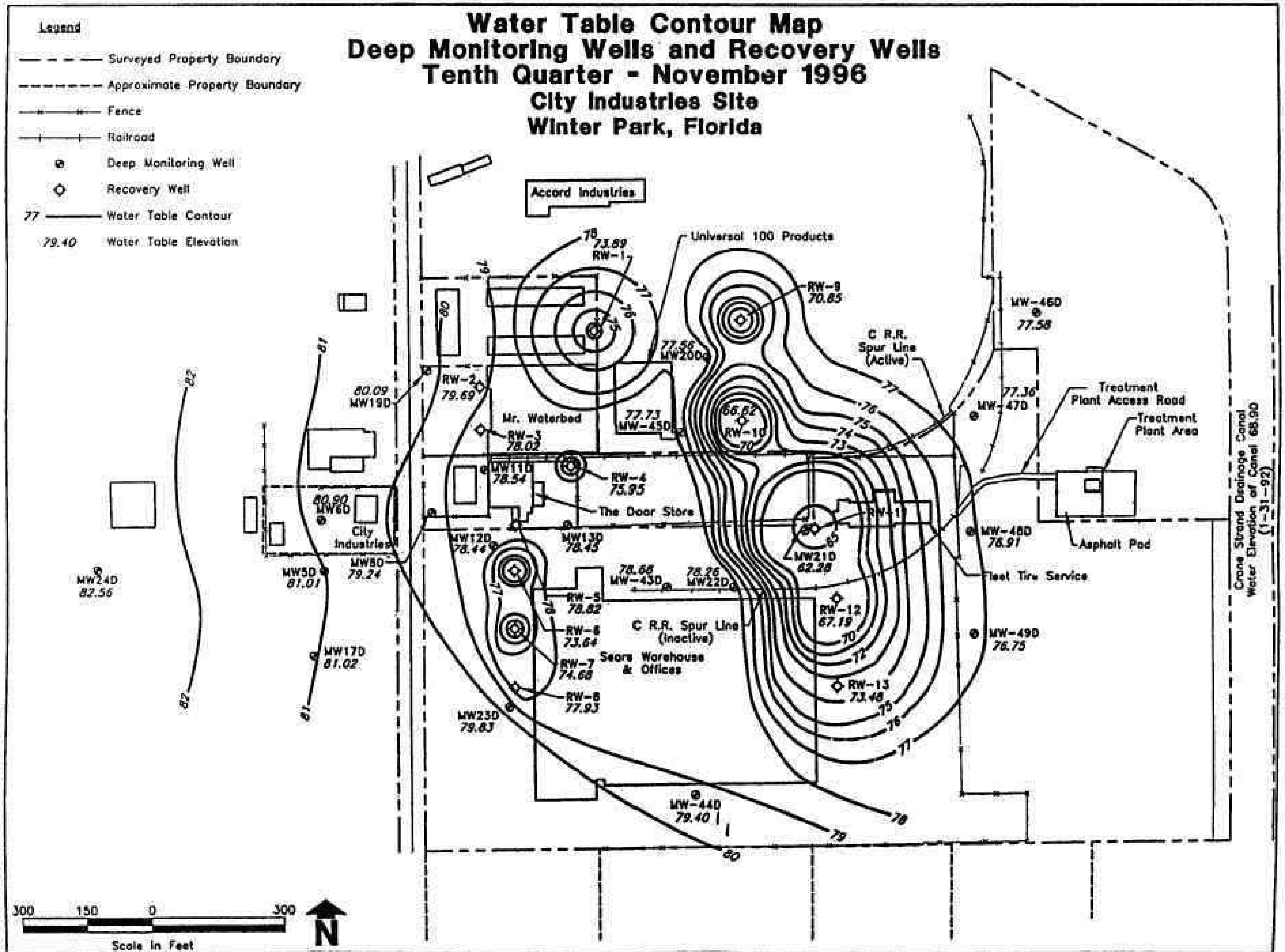
EC394.45.01/03.26.92-MKB/A11B-1A

Water Table Contour Map
Deep Monitoring Wells and Recovery Wells
Ninth Quarter - August 1996
City Industries Site
Winter Park, Florida



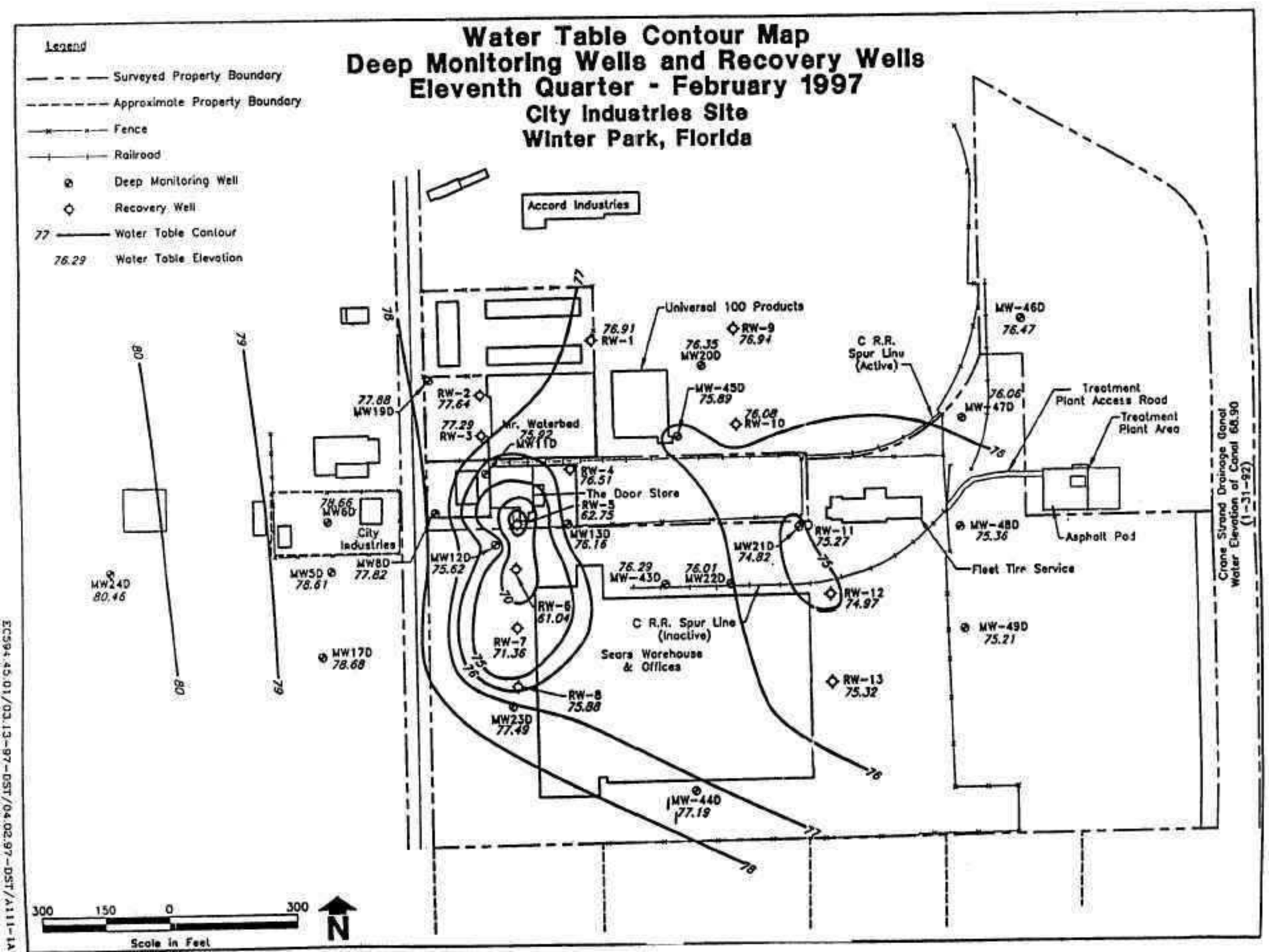
E:\594\45.01\11.18.96-MKB\11.26.96-DST\A105-1A

Water Table Contour Map
Deep Monitoring Wells and Recovery Wells
Tenth Quarter - November 1996
City Industries Site
Winter Park, Florida

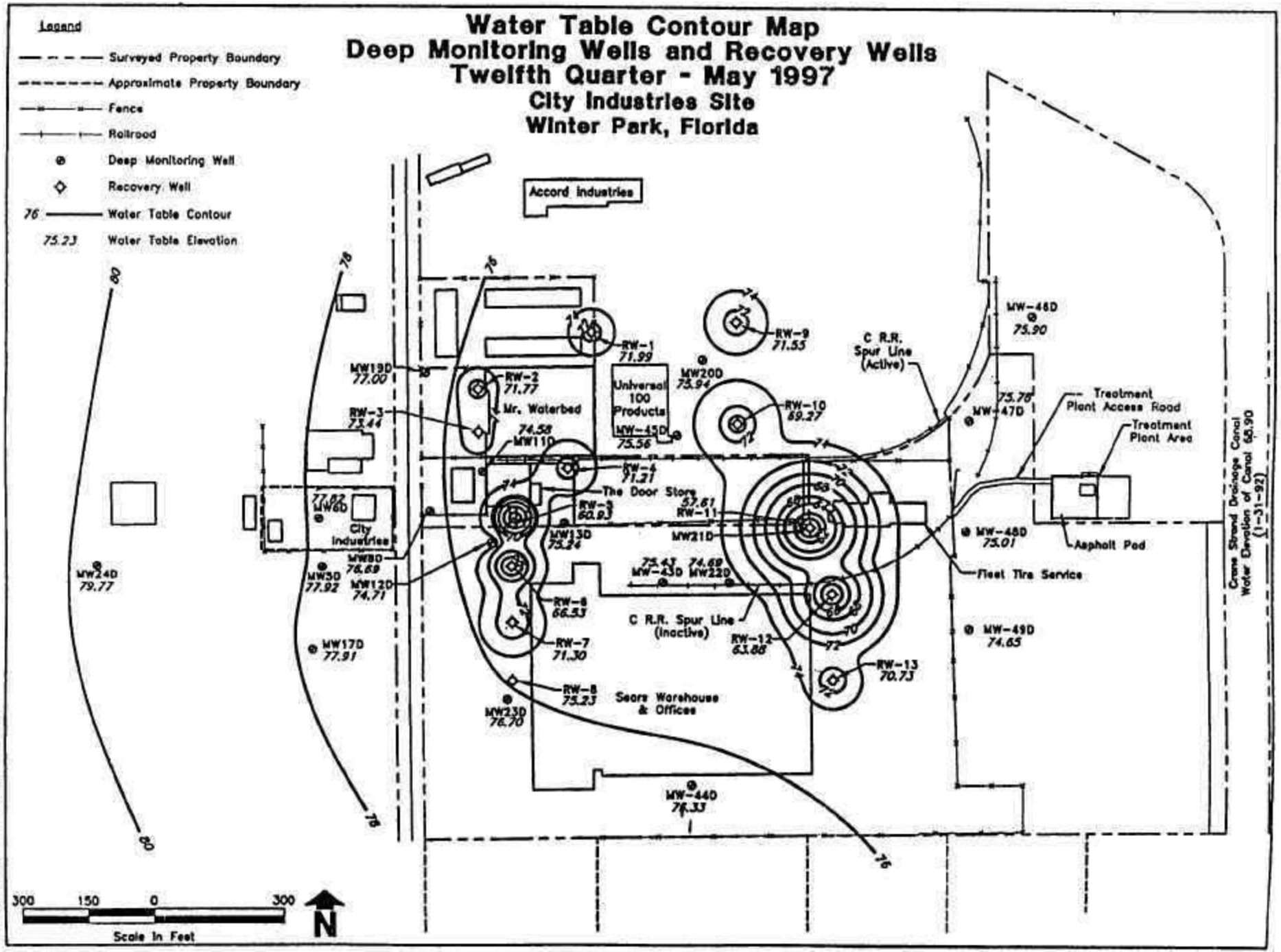


EC94.45.01/03.12-97-DST/A110-1A

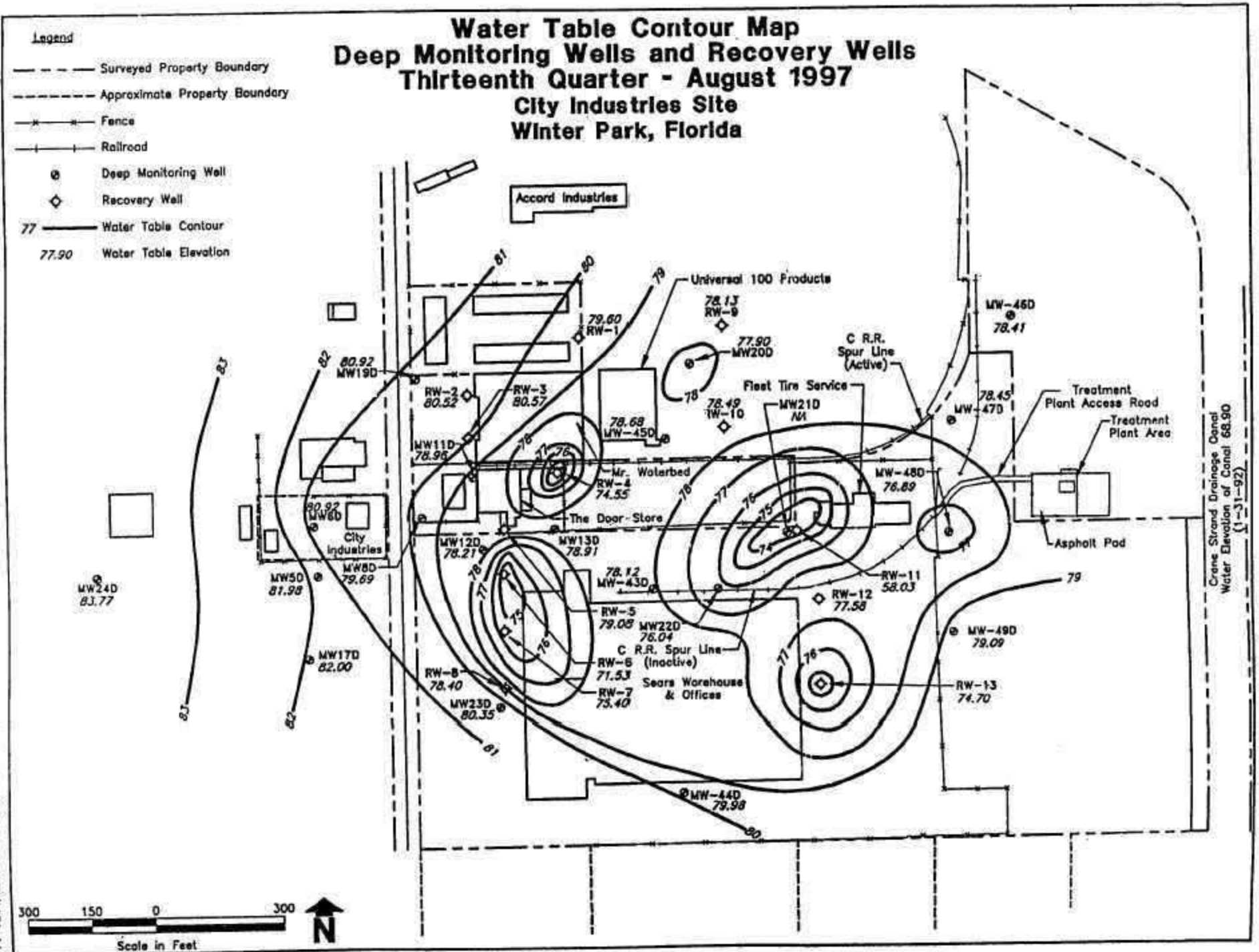
Water Table Contour Map
Deep Monitoring Wells and Recovery Wells
Eleventh Quarter - February 1997
City Industries Site
Winter Park, Florida



EC904-45.01/03.13-97-DST/04.02.97-DST/A111-1A

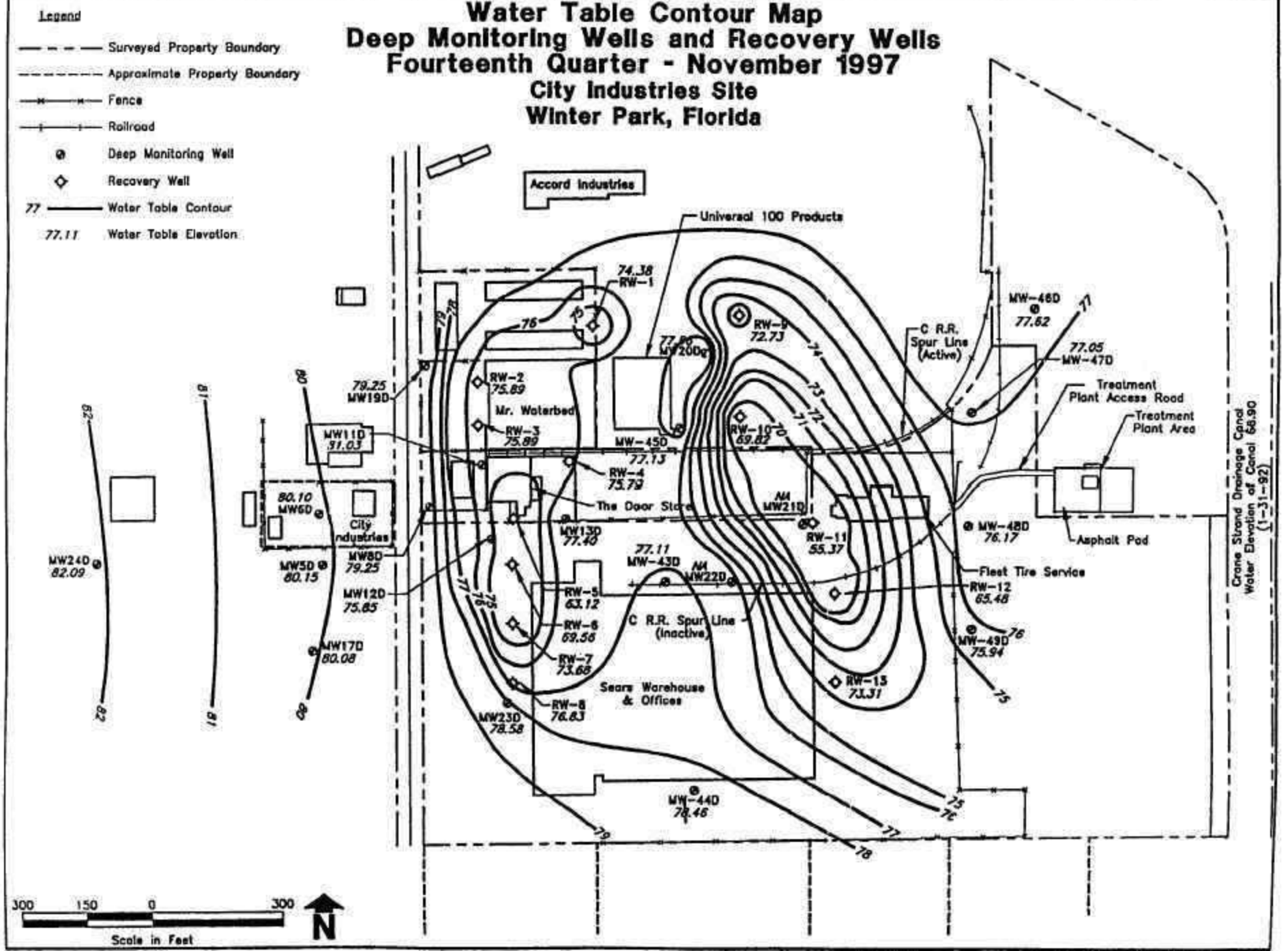

Legend
Surveyed Property Boundary
Approximate Property Boundary
Fence
Railroad
Deep Monitoring Well
Recovery Well
76 Water Table Contour
75.23 Water Table Elevation
Water Table Contour Map
Deep Monitoring Wells and Recovery Wells
Twelfth Quarter - May 1997
City Industries Site
Winter Park, Florida
Accord Industries
Universal 100 Products
The Door Store
City Industries
Sears Warehouse & Offices
C R.R. Spur Line (Active)
C R.R. Spur Line (Inactive)
Mr. Waterbed
Fleet Tire Service
Asphalt Pad
Treatment Plant Access Road
Treatment Plant Area
Crane Strand Drainage Canal
Water Elevation of Canal 68.90
(1-31-92)
MW-46D 75.90
MW-47D 75.78
MW-48D 75.01
MW-49D 74.65
MW-44D 76.33
MW-43D 75.43
MW-22D 74.69
MW-21D
MW-20D 75.94
MW-19D 77.00
MW-17D 77.91
MW-24D 79.77
MW-23D 76.70
MW-1D 77.82
MW-2D 74.71
MW-3D 77.92
MW-8D 76.69
MW-10D 75.24
MW-11D 74.58
MW-45D 75.56
RW-1 71.99
RW-2 71.77
RW-3 73.44
RW-4 71.21
RW-5 60.93
RW-6 57.61
RW-7 71.30
RW-8 66.53
RW-9 71.55
RW-10 69.27
RW-11
RW-12 63.88
RW-13 70.73
RW-8 75.23
300 150 0 300
Scale In Feet
N

Water Table Contour Map
Deep Monitoring Wells and Recovery Wells
Thirteenth Quarter - August 1997
City Industries Site
Winter Park, Florida



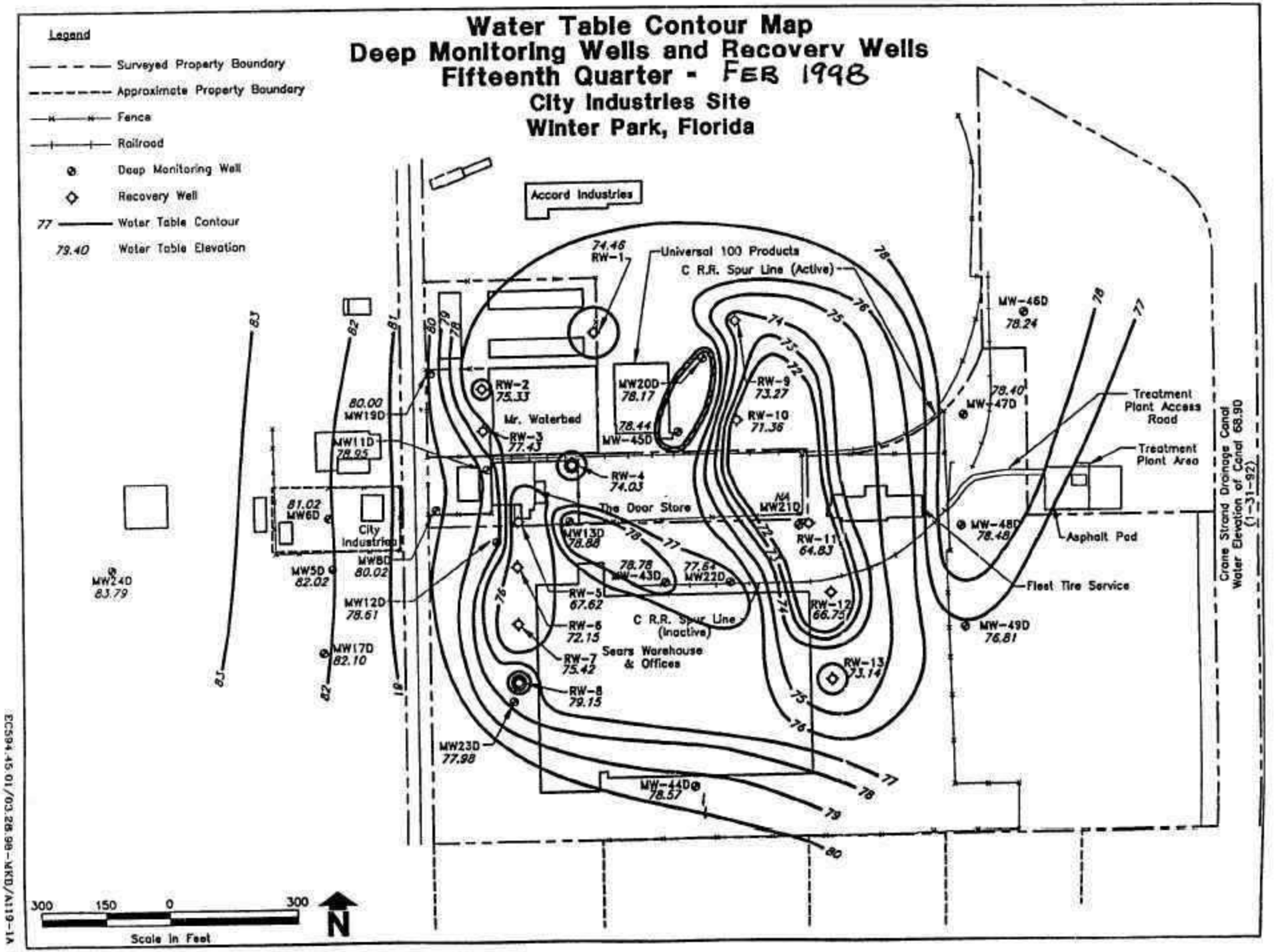
EC594-15.01/03-26-98-MKB/A121-1A

Water Table Contour Map
Deep Monitoring Wells and Recovery Wells
Fourteenth Quarter - November 1997
City Industries Site
Winter Park, Florida



EC594.45.01/03.26.98-MKB/A117-1A

Water Table Contour Map
Deep Monitoring Wells and Recovery Wells
Fifteenth Quarter - FEB 1998
City Industries Site
Winter Park, Florida



E5894.5.010/03.28.98-MKD/A119-1A

Attachment D

Water Quality Data / Whole Chronic Test Results

Well Number	Date
RW #3 (16E4)	09 Jun 98
RW #3 (16ES)	18 Jun 98
RW #3 (16E5)	25 Jun 98
RW #5 (16E5)	01 Jun 98
RW #5 (16E5)	09 Jun 98
RW #5 (16E5)	18 Jun 98
RW #5 (16E5)	25 Jun 98
RW #6 (16E5)	01 Jun 98
RW #11 (16E4)	18 Jun 98

4. SAMPLING AND ANALYSIS

The following analyses were performed in accordance with the NPDES permit. Columbia Analytical Services (CAS) in Jacksonville, FL with split BOD_5 analyses performed by Bottorf Associates in Orlando, FL analyzed those samples.

Sample Date	BOD	Ammonia (N)	Nitrogen (T)	Phosphorous (T)	D O	pH
02 Jun 98	BDL	BDL	2.0	0.67	6.50	6.67
08 Jun 98	BDL	BDL	BDL	0.45	6.60	7.07
16 Jun 98	BDL	BDL	BDL	0.85	6.90	6.78
23 Jun 98	BDL	BDL	BDL	0.05	6.30	6.95
29 Jun 98	BDL	0.2	BDL	0.7	6.50	7.12

Treatment system influent and effluent samples were collected and submitted to CAS for EPA 8260 volatile organic analysis on the following dates:

02, 16 and 29 Jun 1998

Those results are attached to this report (Appendix D).

In addition to the above analyses, grab samples were collected on June 9 from Recovery Wells RW5, RW6, RW11, and RW12 for BOD_5 analyses. The results were 12 mg/l, 5 mg/l, bdl, and bdl. The analytical results are included in this report.

The Chronic Toxicity analyses, required as a condition of our discharge permit, were performed on samples collected in May and June 1998. The final results were received in late June and are reported in this monthly report as well as the first semiannual report (June 1998). The results, as defined by the laboratory, were good however, the reproduction capability of the Ceridaphnia dubia (CD) was questionable, even though the CD did produce. This specific test was conducted, again, confirming that a statistically significant number of offspring were produced in the effluent.

Whole Chronic Toxicity Test samples taken 04, 06 and 07 May					
TEST SPECIES	TEST CONCENTRATION (% EFFLUENT)	NOEC SURVIVAL	NOEC GROWTH	NOEC REPRODUCTION	NOEC FECUNDITY
FM	0%,100%	>100%	>100%		
CD	0%,100%	>100%		<100%	

Ceriodaphnia dubia (CD) in control:
% Survival – 100% Average number of young per female – 25.7
Ceriodaphnia dubia (CD) in sample:
% Survival – 100% Average number of young per female – 19.6
Pimephalus promelas (FM) in control:
% Survival – 92.5% Average FM dry weight – 0.47- mg
Pimephalus promelas (FM) in control:
% Survival – 85.0% Average FM dry weight – 0.39 mg

1st Additional results:

Whole Chronic Toxicity Test samples taken 25, 27 and 28 May					
TEST SPECIES	TEST CONCENTRATION (% EFFLUENT)	NOEC SURVIVAL	NOEC GROWTH	NOEC REPRODUCTION	NOEC FECUNDITY
CD	0, 100, 75, 50, 25 & 12.5%	>100%		>100%	

Ceriodaphnia dubia (CD) in control:
% Survival – 100% Average number of young per female – 25.4
Ceriodaphnia dubia (CD) in sample:
% Survival – 100% Average number of young per female – 18.9

2nd Additional results:

Whole Chronic Toxicity Test samples taken 08, 10, and 11 June					
TEST SPECIES	TEST CONCENTRATION (% EFFLUENT)	NOEC SURVIVAL	NOEC GROWTH	NOEC REPRODUCTION	NOEC FECUNDITY
CD	0,.100, 75, 50, 25 & 12.5%	>100%		>100%	

Ceriodaphnia dubia (CD) in control:
% Survival – 100% Average number of young per female – 28.6
Ceriodaphnia dubia (CD) in sample:
% Survival – 100% Average number of young per female – 30.4

WATER QUALITY DATA
TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLING
CITY INDUSTRIES SITE
WINTER PARK, FL

02 JUN 98

All values reported in μg/L (ppb) BDL = Below Detection Limits

ANALYTE	INFLUENT	EFFLUENT	FIELD BLANK
Acetone	390	BDL	BDL
Acrolein	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL
Benzene	2	BDL	BDL
Bromodichloromethane	BDL	BDL	BDL
Bromoform	BDL	BDL	BDL
Bromomethane	BDL	BDL	BDL
2-Butanone (MEK)	42	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL
Carbon Tetrachloride	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	BDL
Chloroethane	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL
Chloromethane	BDL	BDL	BDL
2-Chloroethyl Vinyl Ether	BDL	BDL	BDL
Dibromochloromethane	BDL	BDL	BDL
1,2-Dibromo-3-Chloropropane (DBCP)	BDL	BDL	BDL
1,2-Dibromoethane (EDB)	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL
Trans-1,4-Dichloro-2-butene	BDL	BDL	BDL
1,1-Dichloroethane	30	BDL	BDL
1,2-Dichloroethane	BDL	BDL	BDL
1-1-Dichloroethene	120	BDL	BDL
Cis-1,2-Dichloroethene	670	9	BDL
Trans-1,2-Dichloroethene	BDL	BDL	BDL
Dichlorodiflouromethane	BDL	BDL	BDL
1,4-Dioxane	BDL	BDL	BDL
Isobutanol	BDL	BDL	BDL
Isopropyl Benzene	BDL	BDL	BDL
p-Isopropyltoluene	BDL	BDL	BDL
Ethyl Benzene	12	BDL	BDL
Ethyl Methacrylate	BDL	BDL	BDL
2-Hexanone	BDL	BDL	BDL
Iodomethane	BDL	BDL	BDL
Methylene Chloroide	BDL	BDL	BDL
4-Methyl-2-pentanone (MIBK)	370	11	BDL
Methyl Tert-Butyl Ether	1	BDL	BDL
Naphthalene	BDL	BDL	BDL
n-Propylbenzene	BDL	BDL	BDL
Styrene	BDL	BDL	BDL
1,1,1,2-Tetrathloroethane	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL
Tetrachloroethene (PCE)	3	BDL	BDL
Toluene	72	BDL	BDL
1,1,1-Trichloroethane (TCA)	5	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL
Trichloroethene (TCE)	35	BDL	BDL

WATER QUALITY DATA
TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLING
CITY INDUSTRIES SITE
WINTER PARK, FL

02 JUN 98

All values reported in μg/L (ppb) BDL = Below Detection Limits

ANALYTE	INFLUENT	EFFLUENT	FIELD BLANK
Trichloroflouromethane (CFC, 11)	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL	BDL
1,3,5-Trimethylbenzene	BDL	BDL	BDL
Vinyl Acetate	BDL	BDL	BDL
Vinyl Chloride	190	BDL	BDL
Xylenes (total)	38	BDL	BDL

WATER QUALITY DATA
TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLING
CITY INDUSTRIES SITE
WINTER PARK, FL

16 JUN 98

All values reported in μg/L (ppb) BDL = Below Detection Limits

ANALYTE	INFLUENT	EFFLUENT	FIELD BLANK
Acetone	360	88	BDL
Acrolein	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL
Benzene	2	BDL	BDL
Bromodichloromethane	BDL	BDL	BDL
Bromoform	BDL	BDL	BDL
Bromomethane	BDL	BDL	BDL
2-Butanone (MEK)	40	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL
Carbon Tetrachloride	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	BDL
Chloroethane	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL
Chloromethane	BDL	BDL	BDL
2-Chloroethyl Vinyl Ether	BDL	BDL	BDL
Dibromochloromethane	BDL	BDL	BDL
1,2-Dibromo-3-Chloropropane (DBCP)	BDL	BDL	BDL
1,2-Dibromoethane (EDB)	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL
Trans-1,4-Dichloro-2-butene	BDL	BDL	BDL
1,1-Dichloroethane	30	BDL	BDL
1,2-Dichloroethane	BDL	BDL	BDL
1,1-Dichloroethene	110	BDL	BDL
Cis-1,2-Dichloroethene	550	8	BDL
Trans-1,2-Dichloroethene	BDL	BDL	BDL
Dichlorodiflouromethane	BDL	BDL	BDL
1,4-Dioxane	BDL	BDL	BDL
Isobutanol	BDL	BDL	BDL
Isopropyl Benzene	BDL	BDL	BDL
p-Isopropyltoluene	BDL	BDL	BDL
Ethyl Benzene	12	BDL	BDL
Ethyl Methacrylate	BDL	BDL	BDL
2-Hexanone	BDL	BDL	BDL
Iodomethane	BDL	BDL	BDL
Methylene Chloroide	BDL	BDL	BDL
4-Methyl-2-pentanone (MIBK)	510	47	BDL
Methyl Tert-Butyl Ether	BDL	BDL	BDL
Naphthalene	BDL	BDL	BDL
n-Propylbenzene	BDL	BDL	BDL
Styrene	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL
Tetrachloroethene (PCE)	4	BDL	BDL
Toluene	73	BDL	BDL
1,1,1-Trichloroethane (TCA)	4	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL
Trichloroethene (TCE)	38	BDL	BDL

WATER QUALITY DATA
TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLING
CITY INDUSTRIES SITE
WINTER PARK, FL

16 JUN 98

All values reported in μg/L (ppb) BDL = Below Detection Limits

ANALYTE	INFLUENT	EFFLUENT	FIELD BLANK
Trichloroflouromethane (CFC 11)	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL	BDL
1,3,5-Trimethylbenzene	BDL	BDL	BDL
Vinyl Acetate	BDL	BDL	BDL
Vinyl Chloride	600	1	BDL
Xylenes (total)	39	BDL	BDL

WATER QUALITY DATA
TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLING
CITY INDUSTRIES SITE
WINTER PARK, FL

29 JUN 98

All values reported in μg/L (ppb) BDL = Below Detection Limits

ANALYTE	INFLUENT	EFFLUENT	FIELD BLANK
Acetone	360	87	BDL
Acrolein	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL
Benzene	2	BDL	BDL
Bromodichloromethane	BDL	BDL	BDL
Bromoform	BDL	BDL	BDL
Bromomethane	BDL	BDL	BDL
2-Butanone (MEK)	38	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL
Carbon Tetrachloride	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	BDL
Chloroethane	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL
Chloromethane	2	BDL	BDL
2-Chloroethyl Vinyl Ether	BDL	BDL	BDL
Dibromochloromethane	BDL	BDL	BDL
1,2-Dibromo-3-Chloropropane (DBCP)	BDL	BDL	BDL
1,2-Dibromoethane (EDB)	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL
Trans-1,4-Dichloro-2-butene	BDL	BDL	BDL
1,1-Dichloroethane	31	2	BDL
1,2-Dichloroethane	BDL	BDL	BDL
1,1-Dichlorethene	140	3	BDL
Cis-1,2-Dichloroethene	560	36	BDL
Trans-1,2-Dichoroethene	BDL	BDL	BDL
Dichlorodiflouromethane	BDL	BDL	BDL
1,4-Dioxane	BDL	BDL	BDL
Isobutanol	BDL	BDL	BDL
Isopropyl Benzene	BDL	BDL	BDL
p-Isopropyltoluene	BDL	BDL	BDL
Ethyl Benzene	11	BDL	BDL
Ethyl Methacrylate	BDL	BDL	BDL
2-Hexanone	BDL	BDL	BDL
Iodomethane	BDL	BDL	BDL
Methylene Chloroide	BDL	BDL	BDL
4-Methyl-2-pentanone (MIBK)	530	37	BDL
Methyl Tert-Butyl Ether	BDL	BDL	BDL
Naphthalene	BDL	BDL	BDL
n-Propylbenzene	BDL	BDL	BDL
Styrene	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL
Tetrachloroethene (PCE)	5	BDL	BDL
Toluene	82	4	BDL
1,1,1-Trichloroethane (TCA)	4	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL
Trichloroethene (TCE)	55	2	BDL

WATER QUALITY DATA
TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLING
CITY INDUSTRIES SITE
WINTER PARK, FL

29 JUN 98

All values reported in μg/L (ppb) BDL = Below Detection Limits

ANALYTE	INFLUENT	EFFLUENT	FIELD BLANK
Trichloroflouromethane (CFC 11)	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL	BDL
1,3,5-Trimethylbenzene	BDL	BDL	BDL
Vinyl Acetate	BDL	BDL	BDL
Vinyl Chloride	670	13	BDL
Xylenes (total)	51	BDL	BDL

4. SAMPLING AND ANALYSIS

The following analyses were performed in accordance with the NPDES permit. Columbia Analytical Services (CAS) in Jacksonville, FL with split BOD_5 analyses performed by Bottorf Associates in Orlando, FL analyzed those samples.

Sample Date	BOD	Ammonia (N)	Nitrogen (T)	Phosphorous (T)	D O	pH
03 Nov 98	BDL	0.1	BDL	0.72	7.50	6.94
10 Nov 98	BDL	BDL	0.12	0.52	7.20	6.54
16 Nov 98	BDL	BDL	0.64	0.67	7.20	6.78
24 Nov 98	BDL	BDL	BDL	0.99	7.20	6.67

Treatment system influent and effluent samples were collected and submitted to CAS for EPA 8260 volatile organic analysis on the following dates:

03 and 16 Nov 1998

Those results are attached to this report (Appendix D).

02. 04 and 05 November – Whole Chronic Toxicity Test samples were collected and delivered to Grove Scientific Laboratories for analysis, the results are as follows:

Ceriodaphnia dubia (Water Flea)		
	Control	100% Effluent
% Survival	>100%	>100%
Average number of young	30.0	27.6

Pimephalus Promelas (Fathead Minnow)		
	Control	100% Effluent
% Survival	>100%	>100%
Average dry weight	0.28 mg	0.24 mg

16 November through 23 November – Second Semi-annual Sampling of monitoring and recovery wells.

5. CHEMICAL ADDITIONS TO TREATMENT SYSTEM

No chemicals were used or added to the groundwater treatment system.

WATER QUALITY DATA
TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLING
CITY INDUSTRIES SITE
WINTER PARK, FL

Trichloroethene (TCE)	29 16 NOV 98	BDL	BDL

All values reported in μg/L (ppb) BDL = Below Detection Limits

ANALYTE	INFLUENT	EFFLUENT	FIELD BLANK
Trichloroflouromethane (CFC 11)	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL	BDL
1,3,5-Trimethylbenzene	BDL	BDL	BDL
Vinyl Acetate	BDL	BDL	BDL
Vinyl Chloride	230	3	BDL
Xylenes (total)	3	BDL	BDL

WATER QUALITY DATA
TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLING
CITY INDUSTRIES SITE
WINTER PARK, FL

16 NOV 98

All values reported in μg/L (ppb) BDL = Below Detection Limits

ANALYTE	INFLUENT	EFFLUENT	FIELD BLANK
Acetone	230	44	BDL
Acrolein	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL
Benzene	2	BDL	BDL
Bromodichloromethane	BDL	BDL	BDL
Bromoform	BDL	BDL	BDL
Bromomethane	BDL	BDL	BDL
2-Butanone (MEK)	19	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL
Carbon Tetrachloride	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	BDL
Chloroethane	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL
Chloromethane	BDL	BDL	BDL
2-Chloroethyl Vinyl Ether	BDL	BDL	BDL
Dibromochloromethane	BDL	BDL	BDL
1,2-Dibromo-3-Chloropropane (DBCP)	BDL	BDL	BDL
1,2-Dibromoethane (EDB)	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL
Trans-1,4-Dichloro-2-butene	BDL	BDL	BDL
1,1-Dichloroethane	26	1	BDL
1,2-Dichloroethane	BDL	BDL	BDL
1,1-Dichlorethene	91	BDL	BDL
Cis-1,2-Dichloroethene	350	18	BDL
Trans-1,2-Dichloroethene	BDL	BDL	BDL
Dichlorodiflouromethane	BDL	BDL	BDL
1,4-Dioxane	680	690	BDL
Isobutanol	BDL	BDL	BDL
Isopropyl Benzene	BDL	BDL	BDL
p-Isopropyltoluene	BDL	BDL	BDL
Ethyl Benzene	11	BDL	BDL
Ethyl Methacrylate	BDL	BDL	BDL
2-Hexanone	BDL	BDL	BDL
Iodomethane	BDL	BDL	BDL
Methylene Chloride	BDL	BDL	BDL
4-Methyl-2-pentanone (MIBK)	410	23	BDL
Methyl Tert-Butyl Ether	BDL	BDL	BDL
Naphthalene	BDL	BDL	BDL
n-Propylbenzene	BDL	BDL	BDL
Styrene	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL
Tetrachloroethene (PCE)	2	BDL	BDL
Toluene	64	2	BDL
1,1,1-Trichloroethane (TCA)	BDL	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL

WATER QUALITY DATA
TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLING
CITY INDUSTRIES SITE
WINTER PARK, FL

Trichloroethene (TCE)	48 03 NOV 98	BDL	BDL

All values reported in μg/L (ppb) BDL =Below Detection Limits

ANALYTE	INFLUENT	EFFLUENT	FIELD BLANK
Trichloroflouromethane (CFC 11)	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL	BDL
1,3,5-Trimethylbenzene	BDL	BDL	BDL
Vinyl Acetate	BDL	BDL	BDL
Vinyl Chloride	260	BDL	BDL
Xylenes (total)	31	BDL	BDL

WATER QUALITY DATA
TREATMENT SYSTEM INFLUENT AND EFFLUENT SAMPLING
CITY INDUSTRIES SITE
WINTER PARK, FL

03 NOV 98

All values reported in μg/L (ppb) BDL = Below Detection Limits

ANALYTE	INFLUENT	EFFLUENT	FIELD BLANK
Acetone	310	66	BDL
Acrolein	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL
Benzene	2	BDL	BDL
Bromodichloromethane	BDL	BDL	BDL
Bromoform	BDL	BDL	BDL
Bromomethane	BDL	BDL	BDL
2-Butanone (MEK)	26	BDL	BDL
Carbon Disulfide	BDL	BDL	BDL
Carbon Tetrachloride	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	BDL
Chloroethane	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL
Chloromethane	BDL	BDL	BDL
2-Chloroethyl Vinyl Ether	BDL	BDL	BDL
Dibromochloromethane	BDL	BDL	BDL
1,2-Dibromo-3-Chloropropane (DBCP)	BDL	BDL	BDL
1,2-Dibromoethane (EDB)	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL
Trans-1,4-Dichloro-2-butene	BDL	BDL	BDL
1,1-Dichloroethane	27	BDL	BDL
1,2-Dichloroethane	BDL	BDL	BDL
1,1-Dichloroethene	100	BDL	BDL
Cis-1,2-Dichloroethene	340	5	BDL
Trans-1,2-Dichloroethene	BDL	BDL	BDL
Dichlorodiflouromethane	BDL	BDL	BDL
1,4-Dioxane	260	230	BDL
Isobutanol	BDL	BDL	BDL
Isopropyl Benzene	BDL	BDL	BDL
p-Isopropyltoluene	BDL	BDL	BDL
Ethyl Benzene	10	BDL	BDL
Ethyl Methacrylate	BDL	BDL	BDL
2-Hexanone	BDL	BDL	BDL
Iodomethane	BDL	BDL	BDL
Methylene Chloroide	BDL	BDL	BDL
4-Methyl-2-pentanone (MIBK)	470	28	BDL
Methyl Tert-Butyl Ether	BDL	BDL	BDL
Naphthalene	BDL	BDL	BDL
n-Propylbenzene	BDL	BDL	BDL
Styrene	BDL	BDL	BDL
1,1,1,2-Tecrachloroethane	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL
Tetrachloroethene (PCE)	1	BDL	BDL
Toluene	66	BDL	BDL
1,1,1-Trichloroethane (TCA)	BDL	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL

Attachment E

Photographs

CITY INDUSTRIES SUPERFUND SITE

SITE PHOTOGRAPHS

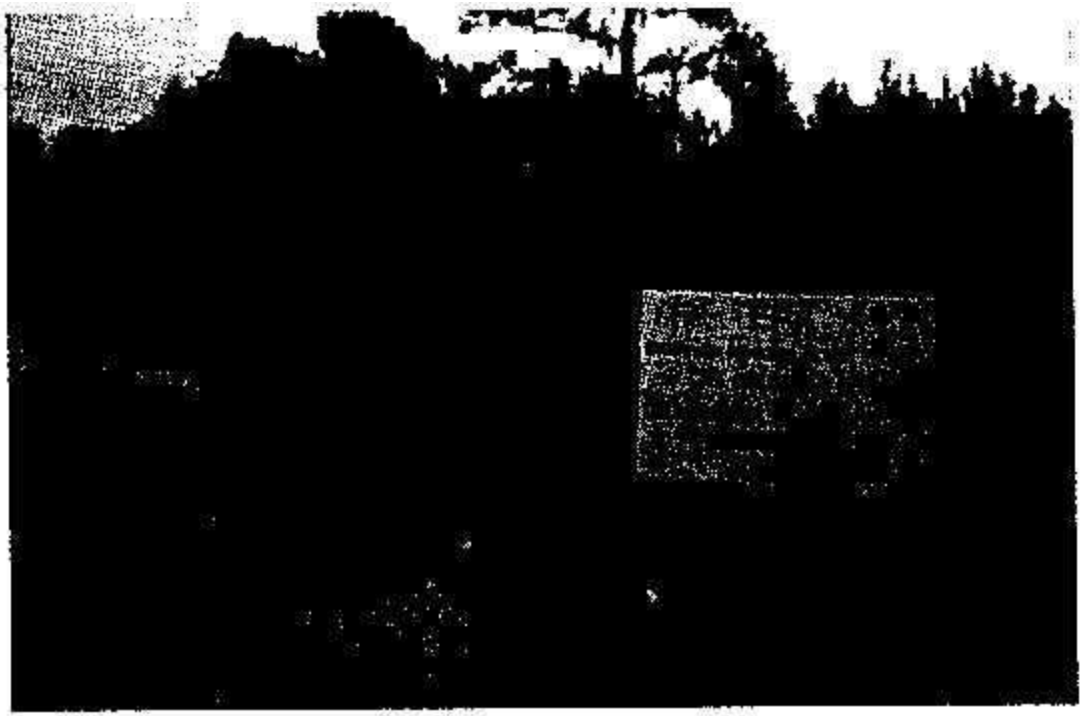


Photo 1 - Entrance Road into Groundwater Extraction and Treatment Facility

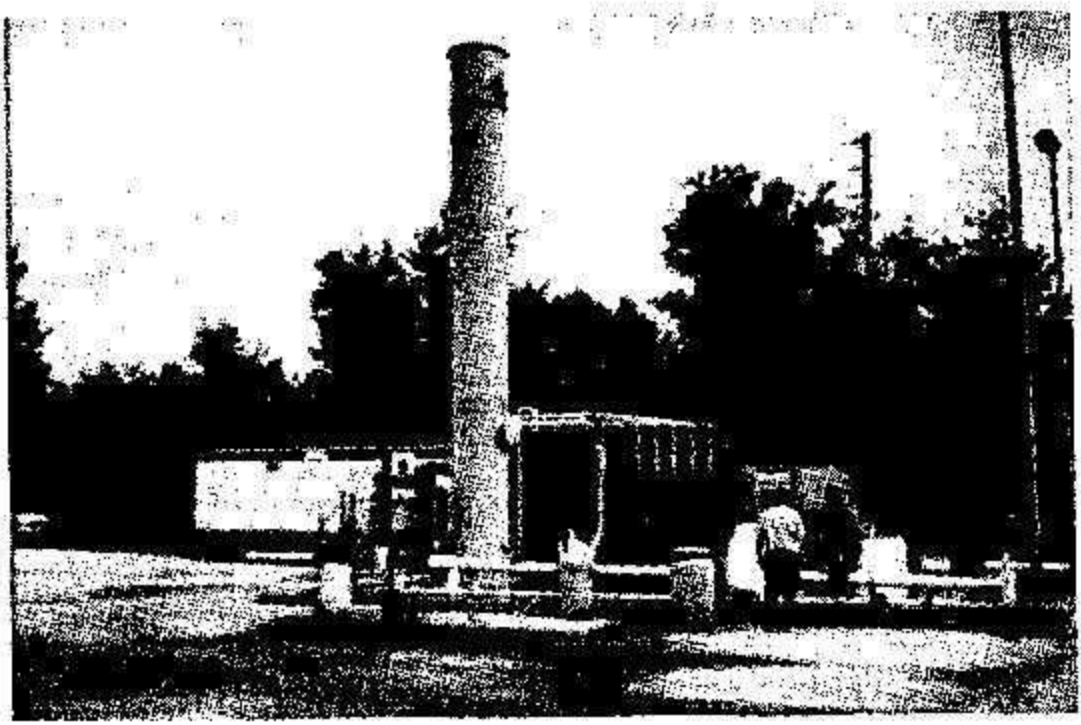


Photo 2 - View of Treatment Facility, Concrete Pad, On-Site Trailer

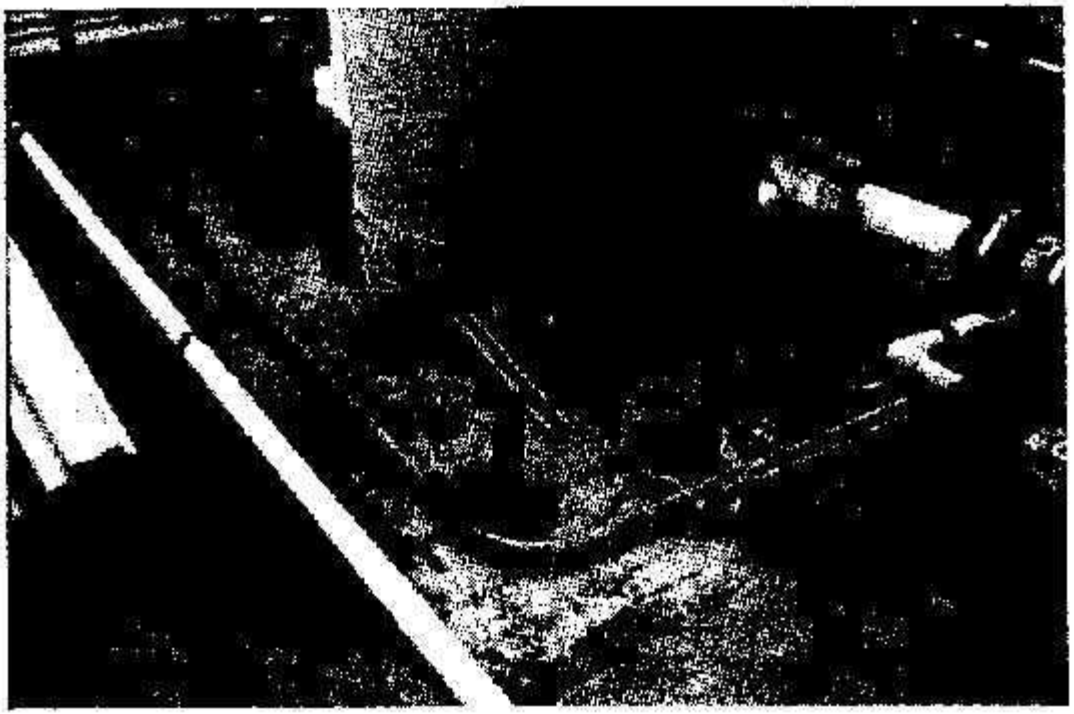


Photo 7 - Valves and 5 HP Pumps and Air Stripper Tower Base Slab

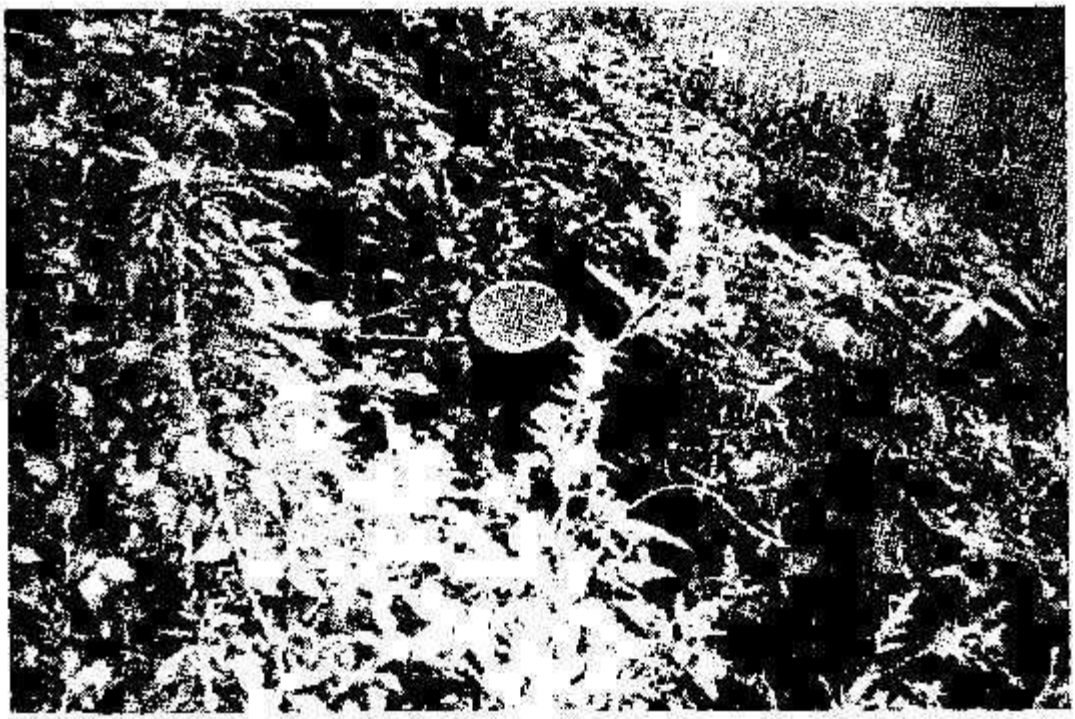


Photo 8 - View of Treated Effluent Flowing from Pipe into Crane Strand Canal