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VanDerHorst Corp. Plant No.1
Site No. 9-05-008

PROPOSED REMEDIAL ACTION PLAN

March 1992

Prepared By

New York State Department Of
Environmental Conservation

SECTION 1: SITE LOCATION AND DESCRIPTION

VanDerHorst Corporation Plant No. 1 Site is a two-acre industrial facility located within the northern section of the City of Olean, Cattaraugus County, New York. The property is bounded by a developed residential neighborhood on its north, east and south and by an industrial area on its west and southwest (Figure 1). The topography of the site is quite flat and surface runoff drains to the City's storm sewer system. The nearest surface water is Olean Creek which is approximately 0.5 miles east of the site. The naturally occurring groundwater flow is toward the southwest. The Alleghany River is approximately 1.5 miles southwest of the site.

II. SECTION 2: SITE HISTORY

The VanDerHorst Corporation began electroplating operations in the early 1940's in a building which had previously been used as a machine shop for the construction of hydraulic presses. There are two reported instances of subsurface process wastewater disposal at the plant site. One account has described a one-time dumping of iron-contaminated chromic acid into a shallow hole on-site sometime during the early 1940's. Also, reference is made in the files of the County Health Department to an on-site wastewater disposal well, which was in operation until approximately 1952.

Since 1952, the process wastewater from the plant was discharged to the Sewer System without any pre-treatment. Until 1951, the plant was using City water for its processes and other needs. In 1951, a production well was installed (46 feet deep) on-site. The County Health Department reported that this process supply well was found to be heavily contaminated with chromium by 1959. Use of this well was discontinued in 1960. In 1962 a new 91-foot deep process well was installed 6 to 8 feet away from the first one.

In 1965, an isolated surface water discharge occurred from the plant, which resulted in a substantial fish kill in the Olean Creek. An employee had emptied a large tank containing the chromic acid wastewater into the plant's sanitary sewer connection. An overflow to a storm sewer occurred because the waste flow was too high in the sanitary sewer. As a result, wastewater reaching the Creek by way of the storm sewer killed at least 10,000 fish.

In 1966, Felmont Oil Corporation developed a wellfield consisting of 6 wells located approximately five hundred feet west of the VanDerHorst Plant. In 1967, Felmont Well No. 5 was shut down due to high levels of chromium contamination in the groundwater. The pumping of groundwater from Felmont wells was in the range of six to ten million gallons per day. This created a cone of depression (approximately 200 feet radius) extending beneath the VanDerHorst Plant and the analysis showed the presence of chromium contamination in trace levels. On June 1, 1967 a press release was made cautioning the public in the North Olean area against the use of groundwater from private wells for human consumption. The County Health Department directed the VanDerHorst Plant to install a chrome destruct unit. In 1968, VanDerHorst installed this unit and treated their wastewater before discharging it into the sanitary sewer. In early 1986 the Felmont wells were shut down. The VanDerHorst plant ceased its operations in July 1987.

SITE HISTORY VERY BROKEN DOESN'T FLOW WELL FROM ONE EVENT TO ANOTHER. VDH PROCESS NEEDS SPECIFICS WHAT DID THEY DISPOSE BESIDES CHROME WASTE

contradictive statements

ON

Treatment was not really related to gw contam. ?

In April 1984 a Phase I study was conducted by Recra Research for the New York State Department of Environmental Conservation (NYSDEC). The study included a compilation of the available information from NYSDEC, Cattaraugus County Department of Health and the United States Geological Survey (USGS). The following conclusions were drawn for the study:

- Groundwater contamination by chromium in the North Olean area has been identified and documented by the Cattaraugus County Department of Health.

- It is not possible to determine from the available information whether VanDerHorst Plant No. 1 has caused or contributed to the observed groundwater contamination.

SECTION 3: CURRENT STATUS

In 1989 the NYSDEC contracted with ERM Northeast to coduct a Remedial Investigation/Feasibility Study (RI/FS) at the site. The RI for the site was done in three phases. Phase I involved sampling and analyzing the surface and subsurface soil, groundwater and Olean Creek sediment samples. Soil samples from the backyards of the residences abutting the site were also taken during the Phase I. The samples were analyzed for volatiles, semi-volatiles and metals. The results of these analyses showed contamination in soil, sediment and groundwater. The major contaminants detected were chromium, lead and arsenic in soil/sediment and chromium, lead and tetrachloroethylene in groundwater. These contaminants were determined to be associated with the past plant activities.

The Phase II RI expanded the investigation based on the results of Phase I RI to define the extent of contamination in various media. The soil/sediment contamination detected were isolated by taking more samples to calculate the volume of contaminated soil and sediment. The extent of groundwater contamination in the shallow part of the aquifer (30 feet) was identified but the extent of contamination in the deeper (60 feet) portion of the aquifer has to be identified. ?

The Phase III RI focussed mainly on the investigation of the plant building interiors. Several monitoring wells and borings were drilled inside the building to collect and analyze groundwater and subsurface soil samples. At several places inside the building wipe and dust samples were collected for chemical analyses. The results of these analyses showed that the soil and groundwater beneath the building is contaminated with chromium, lead, arsenic and tetrachloroethylene. Some of the walls inside the building also were found to be contaminated. Some of the pipelines had asbestos insulation which had to be removed and disposed. The sampling locations of these investigations and the locations of the monitoring wells are shown in figures 2 thru 7 attached. Please refer to the investigation reports for more details.

why? Predetermine conclusions of FS

Geology of the Site

Based on the previous studies conducted by the USGS, the City of Olean lies within the glaciated Alleghany River basin. This basin is a glacially scoured valley that has an east-west trend, and a bedrock relief of several hundred feet (230-330 feet below the land surface). The surface deposits are made up of gravelly silt loam which extends to a depth of 30 feet in some areas of the valley, but comprises only a thin section of approximately 10 feet at the site. A valley fill deposit of fluvial sands and gravel is also present in the area which is approximately 70 feet thick and lies 10-80 feet below land surface. This deposit constitutes the major aquifer in the Olean area and is saturated at depths of 15-20 feet below grade.

According to the investigations, the deposits below the site found to be primarily of gravel and sand with occasional cobbles, overlain by a few feet of till material. The geotechnical logs of monitoring wells installed at the site correspond with the USGS geological cross-section pictured in Figure 8. The subsurface sediments that were encountered up to 60 feet below grade were similar laterally and vertically in the area.

Soil and Sediment Contamination

The investigation report identified four historical source areas as shown in Figure 9. The chromium contamination in source area B and C might have resulted from past disposal practices and area A from the leaking chromic acid tanks. Area D has six plating wells and the water samples from three of these wells showed very high chromium contamination. The USEPA has removed the water from these wells and plugged the wells.

The highest chromium concentration detected in area B in the surface soil was 585,000 ppm and in the subsurface soil at 5-7 feet deep was 30,100 ppm. The highest chromium concentration dectected in area A in the subsurface soil at 24-26 feet was 30,500 ppm. The analyses of the two of six water samples from the plating wells in area D detected chromium at a concentation of 700,000 and 22,900 ppb. The highest chromium concentration detected in area D in surface soil was 7,490 ppm. The area C surface soil sample showed chromium concentration of 5,570 ppm and the subsurface soil sample at a depth of 8-10 feet detected 1,770 ppm of chromium.

Groundwater Contamination

The aquifer beneath the site is approximately 300 feet deep with a intermittent clay layer at 90 feet deep. The aquifer is very productive and has fairly high transmissivity and permeability. The vertical gradient of the aquifer is more than the horizontal gradient. The groundwater flow in the aquifer is generally to the southwest. This gradient is relatively small across the site and appears to vary seasonally with an "average" flow direction of southwest. The City's main water supply system is located to the southeast of the site which is upgradient to the site. A supplementary water supply system to meet the peak demands is located to the northeast of the site but this system pumps the surface water from the Olean Creek and not from the groundwater. The Aquifer has only received waste from past disposal practices and at this date there is no disposal of chemical waste being discharged to the aquifer. from this site...

The maximum chromium concentrations detected in groundwater during the investigation were 264,000 ppb at 30 feet deep and 55,700 ppb at 60 feet deep. While the exact margin of the downgradient plume is not known chromium has been detected approximately 750 feet from the fenceline at a concentration of 850 ppb at MW-19D. The Tetrachloroethelyne contamination in groundwater seems to decrease in concentration from the source to non-detect at about 300 feet from the site boundary.

While the time frame involved is uncertain, the local gradient will cause the contaminated groundwater to migrate toward the Alleghany River. Due to the evident preference for deep (40'-90') migration it is reasonable to assume that the main body of contamination will not discharge to the River but will instead travel in the aquifer beneath the River and parallel its course down the valley.

The Village of Alleghany lies along this route and is supplied with water from the aquifer. The nearest of these wells is approximately 2.35 miles (straight line) away and approximately 3.22 miles via the most likely migration route. The anticipated concentration of chromium in the plume, if and when it reaches this area, is not readily determinable at this distance due to the influx of water from the River and tributaries and valleys along the Alleghany River Valley. Furthermore, there will undoubtedly be other sources of contamination within the aquifer which will influence the quality of water.

Health and Environmental Risk Assessment

Based on the results of the investigations a risk assessment was done to identify the various risks posed by the site contaminants through various routes of exposure. Table 1 lists the chemicals identified that are of concern for the site based on the results of the contamination assessment. The Table 2 shows the results of exposure, toxicity and risk assessments.

The Investigation concluded that under current conditions there are carcinogenic effects from chromium and arsenic in soil. Under future conditions, the carcinogenic effects include tetrachloroethane in drinking water, and chromium and arsenic in soil. The non-carcinogenic effects under future conditions include chromium and lead in groundwater. However, the goundwater in the area is not being used for drinking water. All the residents are connected to the municipal water system.

Based on the environmental risk assessment, no adverse effects to sensitive environmental resources are expected to occur as a result of the site contaminants. However, several of the contaminants found in sediment and surface water samples collected from Olean Creek are above standards and may be impacting the benthic and aquatic life in this Creek.

For the purpose of determining the clean up levels for the various contaminated media of the site, NYSDEC Groundwater Standards were considered as criteria for groundwater contamination remediation. For soil remediation, based on health effects clean-up levels were calculated for chromium only. Although lead and arsenic were detected at the site it was only in those areas where chromium was detected in high concentrations. So by remediating the soil for chromium, lead and arsenic also will be cleaned up from the soil. The calculated chromium clean up level for soil is 50 ppm (mg/kg) and as per NYSDEC's sediment criteria, the clean up level for Olean Creek sediments is 26 ppm (mg/kg).

United States Environmental Protection Agency's (USEPA) Removal Action

During the initiation of the investigation at the site, it was found that hazardous chemicals were improperly stored inside the plant building. The residences are located very close to the site and if a fire occurred in the building, which was unattended, the problem would be complex and multiple in nature. The NYSDEC requested USEPA to take action immediately because of the imminent threat posed by these chemicals. The USEPA mobilized their team in the middle of 1989 and removed all the chemicals. The removal action completed by USEPA has eliminated the threat posed by the various chemicals and spent solutions which were improperly stored inside the building on the site.

SECTION 4: ENFORCEMENT STATUS

The Division of Environmental Enforcement's (DEE) attempts to get the owners of the site to remdiate the site have been unsuccessful. Another attempt will be made before the State will implement the remedial action.

SECTION 5: GOALS FOR THE REMEDIAL ACTION

The following remedial action objectives that will protect human health and environment were developed for this site:

a. Remediate identified areas of contaminated surface and subsurface soil to limit the leaching of contaminants from soil to groundwater.
b. Remediate the groundwater to acceptable levels for chromium, lead and tetrachloroethylene.
c. Remediate the storm sewer of residual contamination and contaminated Olean Creek sediments to limit the impacts of the contaminants to benthic and aquatic life.
d. Remediate the building structures by demolishing to remediate the contaminated soil beneath the building.

SECTION 5: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The FS Report identified the following remedial technologies for contaminated soils, sediments, groundwater and structures in the preliminary screening process.

Remedial Technologies for Soil/Sediment

- No Action
- Capping
- Off-Site Disposal
- Encapsulation
- Stabilization/Solidification

No Action - This alternative would not utilize any active remedial technology for the site soils, sediments, groundwater and structures. Under this action, institutional controls (access and deed restrictions) would be implemented at the site to minimize potential human exposure to the soils, sediments, groundwater and structures.

Capping - Under this alternative, the contaminated soil/sediment will be consolidated in one area of the site and a capping will be laid on top. The capping will be made of synthetic membranes, asphalt, concrete, clay and soil. The capping will minimize the wind erosion of the contaminated soil and the precipitation water getting in contact with the contaminated soil.

Off-Site Disposal - This alternative consists of excavating the soil and dredging the sediments that are above the action level and transporting to an off-site RCRA landfill for disposal.

Encapsulation - This technology physically microencapsulates waste by sealing them in an organic binder or resin thereby isolating the contaminated soil from leaching solutions.

Stabilization/Solidification - Stabilization is a process by which chemical agents are mixed into contaminated soils to alter the physical and/or chemical state of the hazardous compounds in the soil thus rendering the soil less toxic and the contaminants less leachable.

does this show boundary of clean-up ?

Remedial Technologies for Groundwater

A groundwater modelling was performed during this investigation to predict the capture area of several patterns of recovery wells around the site. The model was also used to calculate the geological properties of the aquifer. The ideal locations for the groundwater recovery wells as per the calculations of this modelling are shown in Figure 12. Based on the available information and the predictions of the model this pattern of pumping will recover the contaminated groundwater up to 50 ppb of chromium which is the groundwater standard for chromium. w/in boundary - model

Assuming this groundwater pumping system will be implemented at the site the following alternatives were evaluated for treatment of the water:

- Chemical Precipitation
- Off-Site Disposal of POTW
- Off-Site Disposal to Olean Creek
- Carbon Adsorption

Chemical Precipitation - The treatment of groundwater using precipitation involves the use of precipitant chemicals to convert inorganic chromium into insoluble precipitants which are settled out of the wastewater stream thereby reducing the concentration of inorganic heavy metals in the groundwater.

Off-Site Disposal to POTW - This alternative involves the withdrawal of groundwater, pretreat at the site to POTW standards and discharge it to the POTW via the sanitary sewer system.

Off-Site Disposal to Olean Creek - This alternative involves the withdrawal of groundwater, pretreatment at the site to surface water standards and discharge it to the Creek via pipelines.

Carbon Adsorption - This pretreatment involves adsorption of chromium from the contaminated groundwater to activated carbon thereby reducing the concentration of chromium in groundwater. The pretreated water will be discharged to POTW.

These technologies for the soils/sediment and groundwater were grouped together to form seven potential alternatives listed below:

Alternative 1: No action/Limited action

Alternative 2: Capping, Sediment removal and on-site consolidation for capping, Demolition/Decontamination of the building, Storm sewer cleaning and Long-term monitoring.

Alternatives 3 thru 7 include the following four technologies regardless of the technologies proposed for the contaminated soil/sediment:

a. Demolition/decontamination of the building
b. Storm sewer cleaning
c. Long-term monitoring
d. Groundwater extraction, pretreatment using conventional precipitation or carbon adsorption and discharge to POTW or Olean Creek.

Alternative 3: Excavation of soil/sediment and off-site disposal.

Alternative 4: Excavation of soil/sediment and on-site solidification/stabilization.

Alternative 5: Excavation of soil/sediment, on-site solidification/stabilization of less contaminated soil and off-site disposal of highly contaminated soil.

Alternative 6: Off-site disposal of highly contaminated soil and capping of the less contaminated soil/sediment.

Alternative 7: Excavation and encapsulation of contaminated soil and sediment.

The cost summary of the seven alternatives is presented below:

Summary of Costs

Alternative	Capital costs	O & M costs	Total costs
1	$ 0	$466,000	$466,000
2	$ 9,917,000	$466,000	$10,383,000
3	$14,919,000	$14,363,000	$29,282,000

4	$ 8,989,000	$14,363,000	$23,352,000
5	$11,398,000	$14,363,000	$25,761,000
6	$10,551,000	$14,363,000	$24,914,000
7	$ 9,553,000	$14,363,000	$23,916,000

The above table represents the present worth cost of the alternatives using a 1991 base year and a maximum of 30-year operation and maintenance schedule.

It was determined that the cost effective pretreatment for groundwater would be the Carbon Adsorption method and disposal to local POTW. The above cost summary represents the cost for groundwater remediation with Carbon Adsorption pretreatment and disposal to POTW. The costs are based on the groundwater pumping system developed by the groundwater model. this comprises five wells wwith a combined pumping rate of 1350 gallons per minute. The present worth of the construction and operational cost included in alternatives 3 through 7 which are associated with the groundwater pumping and treatment system is approximately $13,000,000.

The final alternatives were evaluated against the following eight (8) criteria: 1) compliance with applicable or relevant and appropriate regulations (ARARs), 2) reduction of toxicity, mobility or volume, 3) short-term impacts, 4) long-term effectiveness and permanence, 5) implementability, 6) cost, 7) community acceptance, and 8) overall protection of human health and environment. The feasibility study provides a detailed description of the evaluation process.

SECTION 6: SUMMARY OF THE GOVERMENT'S DECISION

Based on the evaluation of alternatives performed in the feasibility study Alternative 4 was recommended as the preferred alternative. However, the full scale pumping system developed by the groundwater model is not recommended. In general ,there is a low level of confidence in the ability of groundwater pump and treat systems to restore this aquifer to pre-release conditions. It is inappropriate at this time to commit the resources required to implement the full scale groundwater pumping program due to numerous uncertainties associated with the technique and the accuracy of the model.

Groundwater modelling, while a useful means of predicting current and future aquifer conditions, is subject to the effect of a wide range of assumptions used in the model development. In an aquifer as voluminous as the Olean Aquifer the baseline conditions at the site may be fairly well understood and yet the model projections will vary greatly as different variables are used to simulate the aquifer's behavior under "stress" or dynamic conditions.

In modelling the extent and concentration of this contaminant plume some of the assumptions made were that the source would be completely removed, the site is the only source of contamination present, the aquifer is 90 feet in effective thickness and continuous across the model area, and conditions directly measured below the site are the same as those found downgradient.

A pilot program to further define the characterstics of the aquifer and to control the migration of the highly contaminated groundwater at the site it is recommended. This includes installation of a pumping well at the core of the contamination plume. The pumping rate will be from 250 - 300 gpm. The pumped groundwater will be treated with activated carbon as a pre-treatment. After pre-treatment the water will be discharged to the POTW. It is anticipated that the approval for discharging to POTW can be obtained readily because of the low volume discharge. Major advantages of this approach are:

- May remove a significant contamination from the aquifer from the core of the contamination plume.
- Will provide more long-term data on the aquifer to determine its characteristics.
- Minimize the rate of contaminant spread and migration in the aquifer.
- After a certain period of time, with the available data, future action will be determined.

The present worth cost of this groundwater remediation alternative would be approximately $2,650,000. This includes the capital cost (approximately $200,000) of installing a pumping well, pipeline network and a building to keep the pre-treatment process. The estimate was for operating the system for only five years. The estimate also took into account the charge for discharging it to the POTW which is 90 cents per 748 gallons of water.

Recommended Remedial Alternative

The following are the various elements of the Recommended Remedial Alternative for the site:

Plant Building Decontamination
Asbestos Removal From The Building
Plant Building Demolition
Olean Creek Sediment Removal
Storm Sewer Cleaning
Surface And Subsurface Soil Removal
Stabilization/Solidification of Soil/Sediment
Site Restoration
Groundwater Pumping, Treatement And Discharge as a Pilot Test
Long-Term Groundwater Monitoring

The estimated present worth cost of this alternative is:
Capital Costs - $8,555,000
O&M Costs - $2,916,000

The recommended remedial action satisfies the remedial objectives for the site and the following eight evaluation criteria:

- Compliance with ARARs
  The preferred alternative will meet State and Federal ARARs by removing the contaminated soil/sediments from the site and the chromium contamination in groundwater is expected to decrease over time to background levels.

- Reduction of Toxicity, Mobility or Volume
  The preferred alternative will effectively remove the contaminated soil/sediments from the site, thereby reducing the toxicity and mobility of the soil. The toxicity, mobility or volume of the chromium present in the groundwater would not be immediately reduced but the chromium present in the groundwater (toxicity) is expected to decrease overtime to non-hazardous levels.

- Short-Term Impacts
  The preferred alternative will result in a small increase in short-term risks. Workers involved in excavation and transportation of contaminated soil/sediments will have the potential for increased exposure to chemical contaminants at the site. The community may also be exposed to increased risks due to exposure to air-borne contaminants which may escape from the site during the implementation of the preferred alternative. Engineering controls such as instrument monitoring and water spray for dust control will be employed to minimize the short-term impacts.

- Long-Term Effectiveness and Permanence
  The preferred alternative would effectively remove the contaminated soil/sediments from the soil, hereby isolating the chromium present in the site soils/sediments above clean-up level. The groundwater is expected to stabilize with time. A long-term monitoring plan will be implemented to ensure the effectiveness of the final remediation.

- Implementability
  The preferred alternative has been successfully implemented at other hazardous waste sites. It employs relatively basic engineering technology which will provide a high degree of operational reliability.

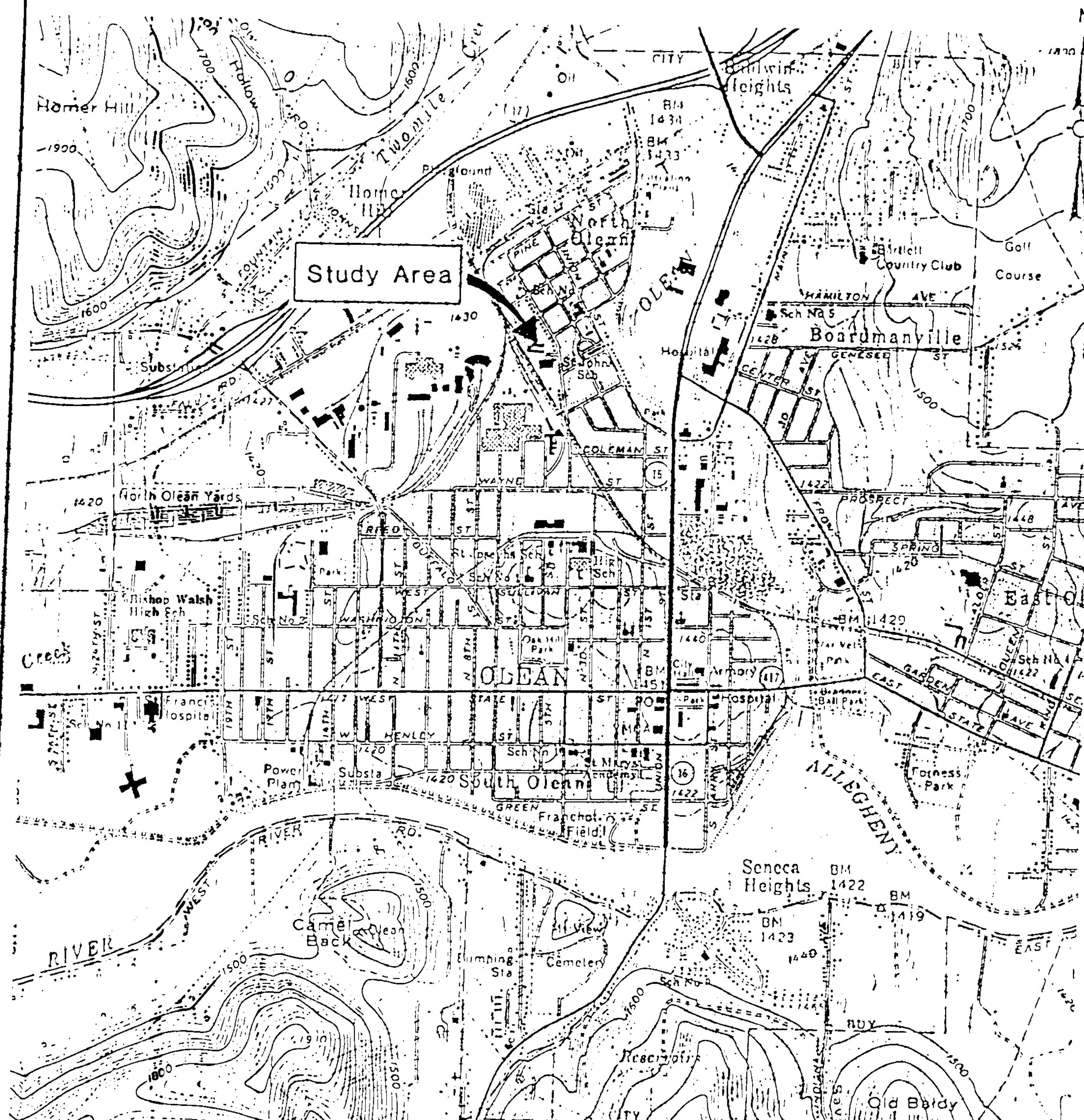
- Cost
  The preferred alternative is the most cost-effective of the alternatives evaluated based on the extent of contaminated soil/sediments present at the site and the groundwater contamination at the site. A detailed cost analysis for each alternative is presented in the FS Report.

- Community Acceptance
  Community concerns are believed to focus on a remedial alternative which will be most protective of public health. A full assessment of community attitudes toward the preferred alternative and the other alternatives evaluated will be made following the formal public comment period and public informational meeting.

- Overall Protection of Public Health and the Environment
  Considering all factors involved in the evaluation of remedial alternatives, the preferred alternative is the most favorable. It will be protective of public health in that direct contact to contaminated soil/sediments is eliminated by removing and disposing the contaminated soil/sediments. Danger to the environment through the migration of contaminants off-site via the groundwater will be mitigated with the soil removal which is believed to be the source contributing contamination to the groundwater.

FIGURE 1

FIGURE 1-1
Site Location Map - Van Der Horst Company
RI/FS Plant No.1

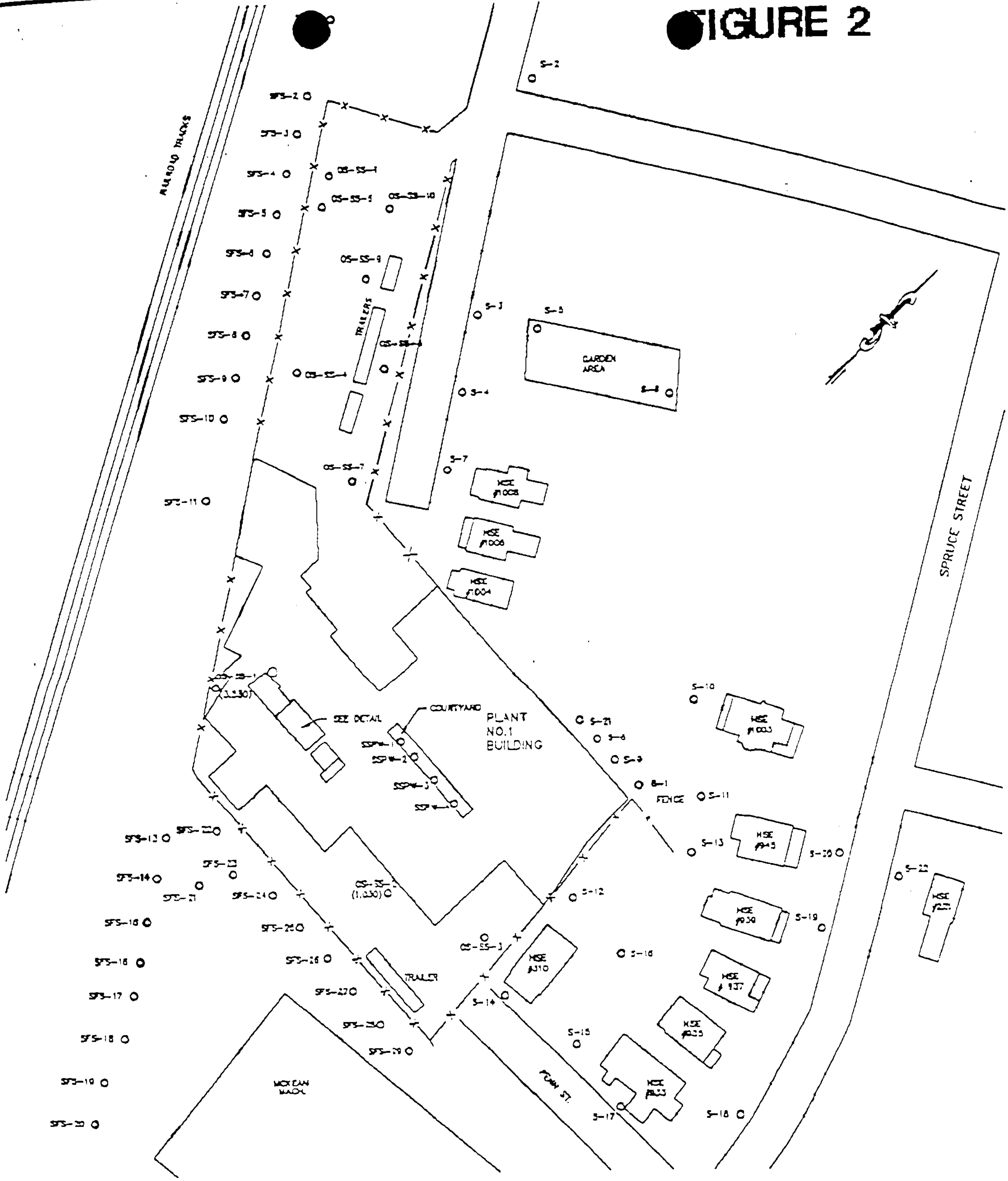


Source: U.S.G.S. Quadrangle Map, Olean, N.Y.

Scale: 1"-2000'

ERM-Northeast
Environmental Resources Management

FIGURE 2



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

Figure 2-3

VAN DER HORST PLANT NO. 1
SURFACE SOIL SAMPLE LOCATIONS

LEGEND:

O Surface Soil Sample

ERM-Northeast
Environmental Resources Management

148621

FIGURE 3

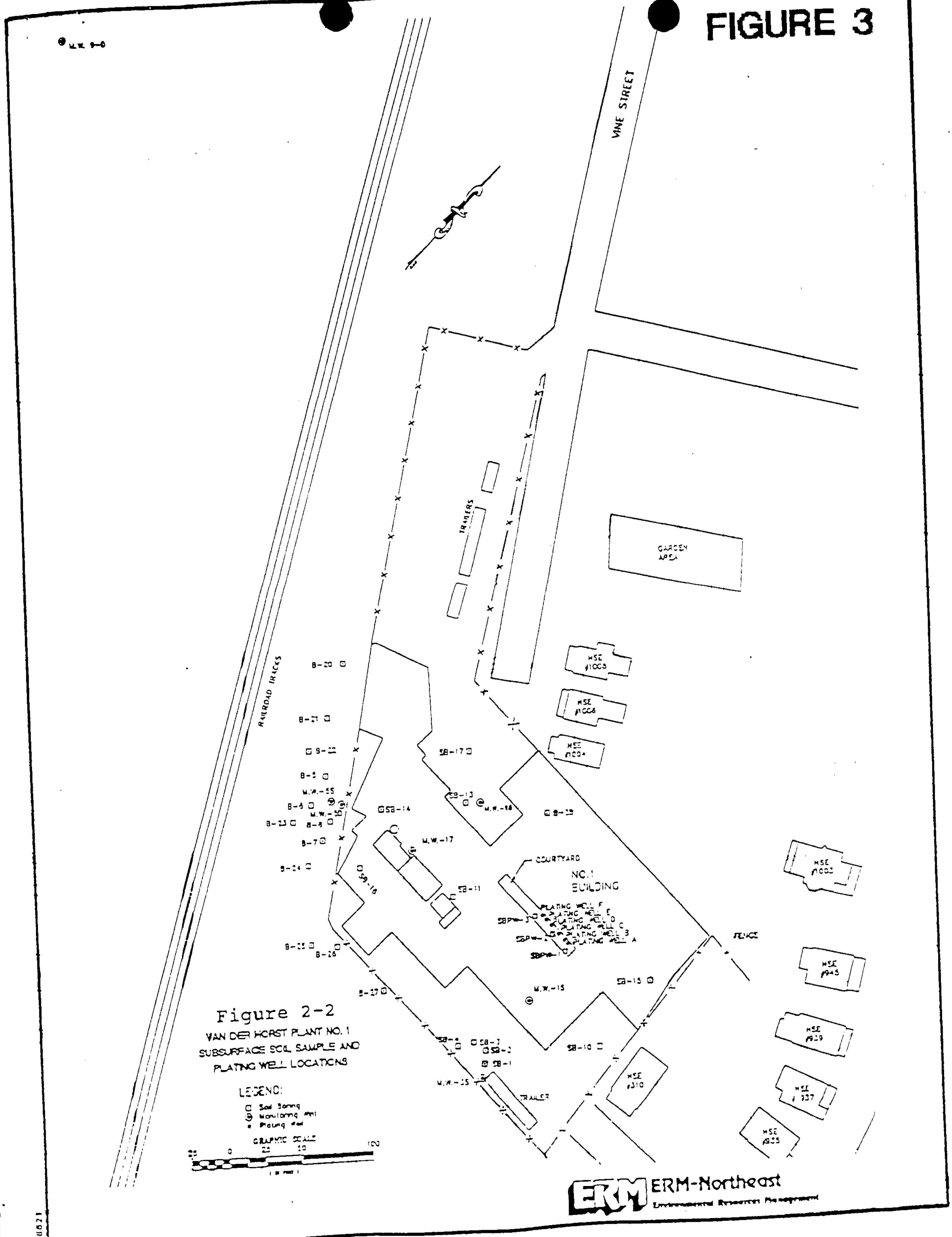


Figure 2-2
VAN DER HORST PLANT NO. 1
SUBSURFACE SOIL SAMPLE AND
PLATING WELL LOCATIONS

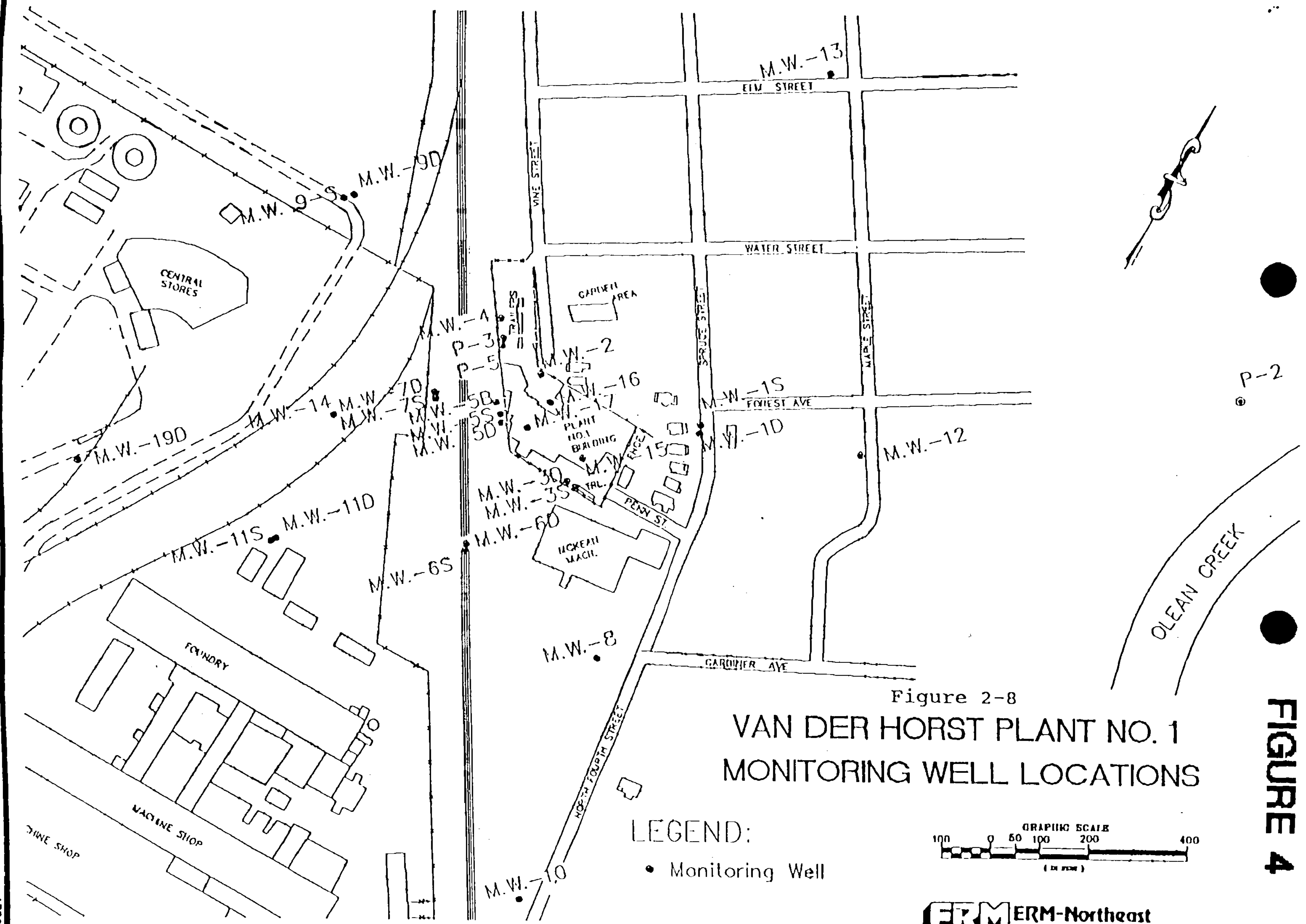


Figure 2-8

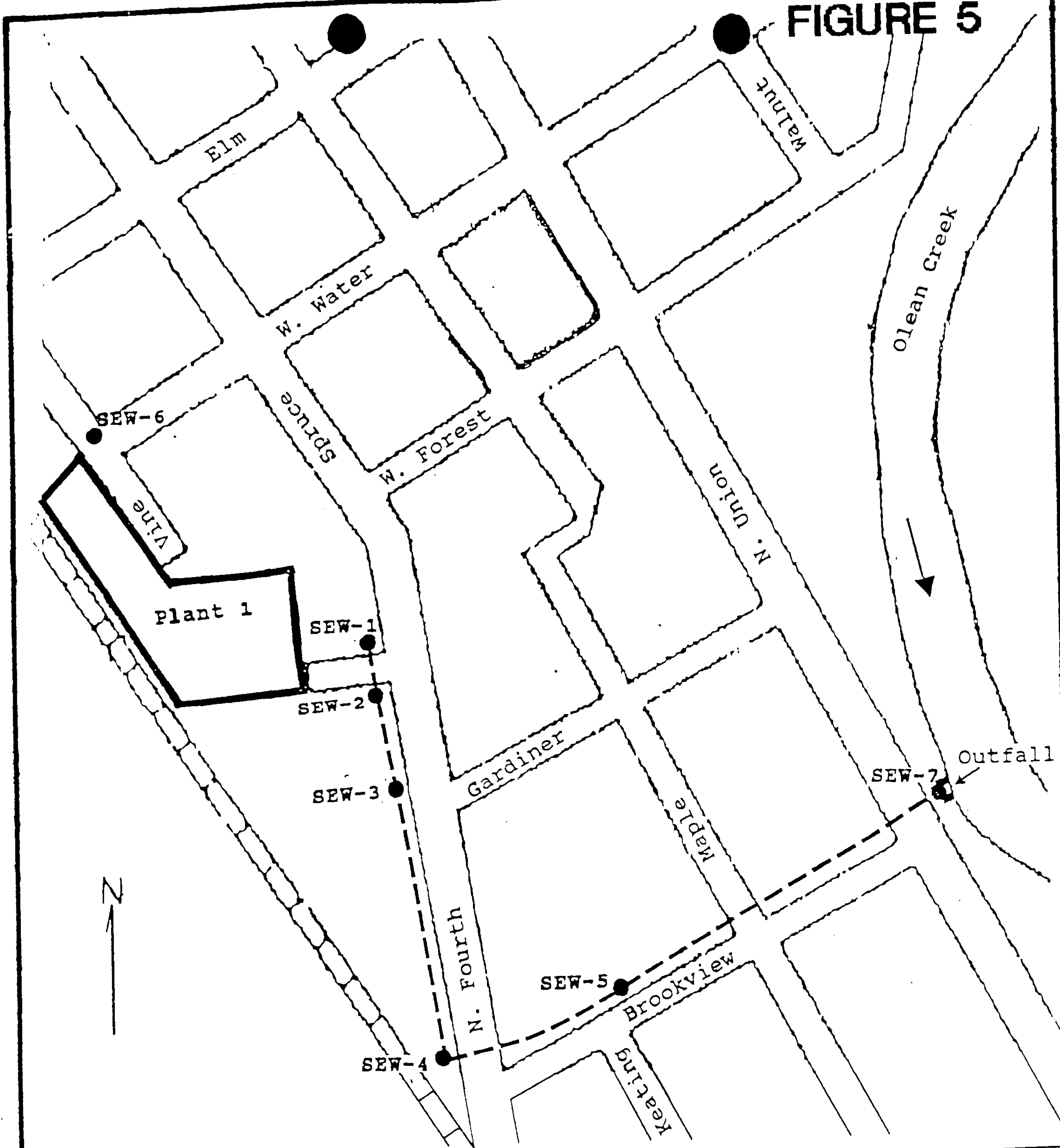
VAN DER HORST PLANT NO. 1
MONITORING WELL LOCATIONS

FIGURE 4

2-25

146521

FIGURE 5



Sewer sampling location ●

Storm sewer line – – – –

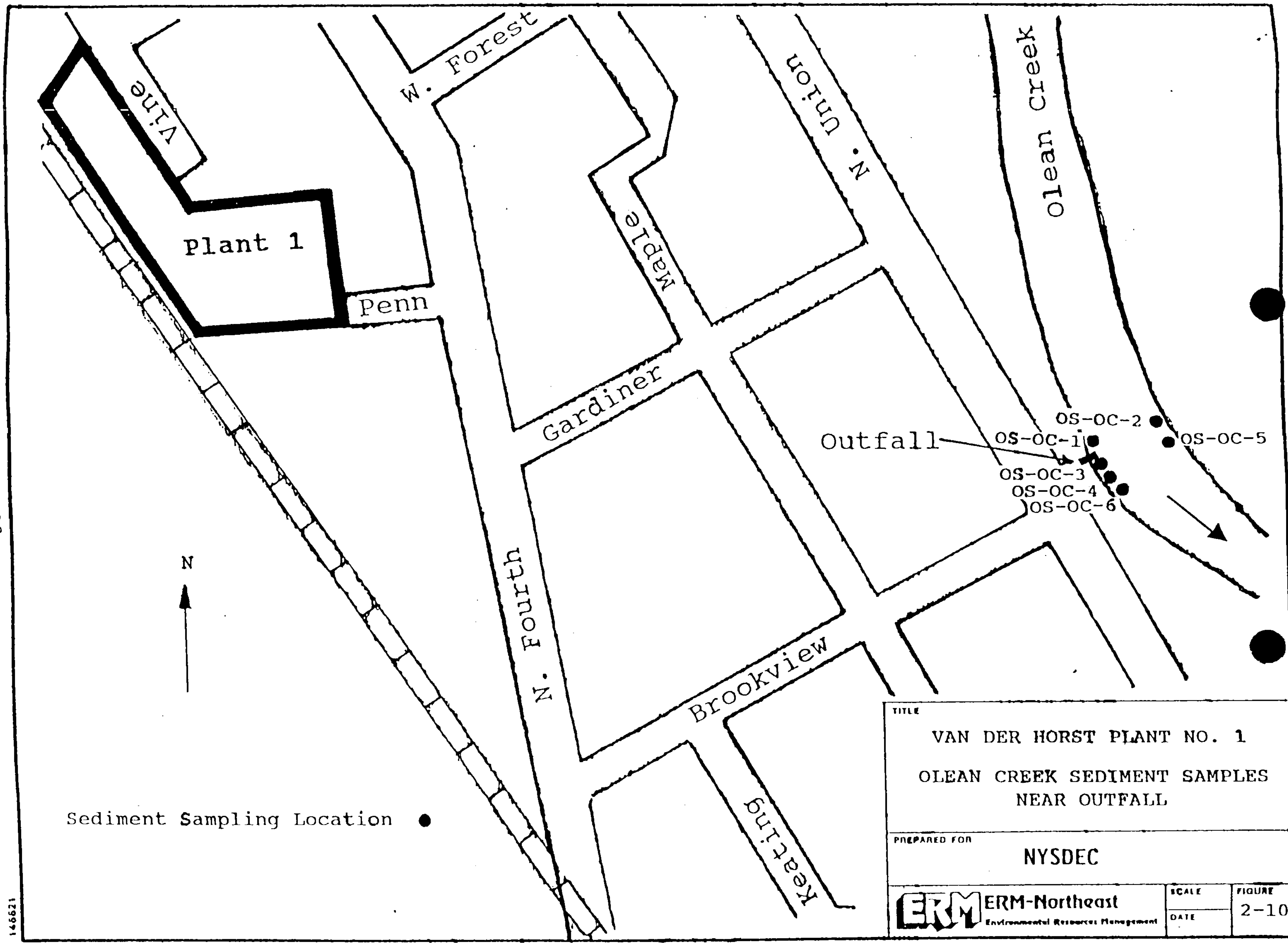
TITLE

VAN DER HORST PLANT NO. 1
SEWER SAMPLE LOCATIONS

PREPARED FOR NYSDEC

ERM-Northeast
Environmental Resources Management

SCALE	FIGURE
DATE	2-11



TITLE
VAN DER HORST PLANT NO. 1
OLEAN CREEK SEDIMENT SAMPLES NEAR OUTFALL

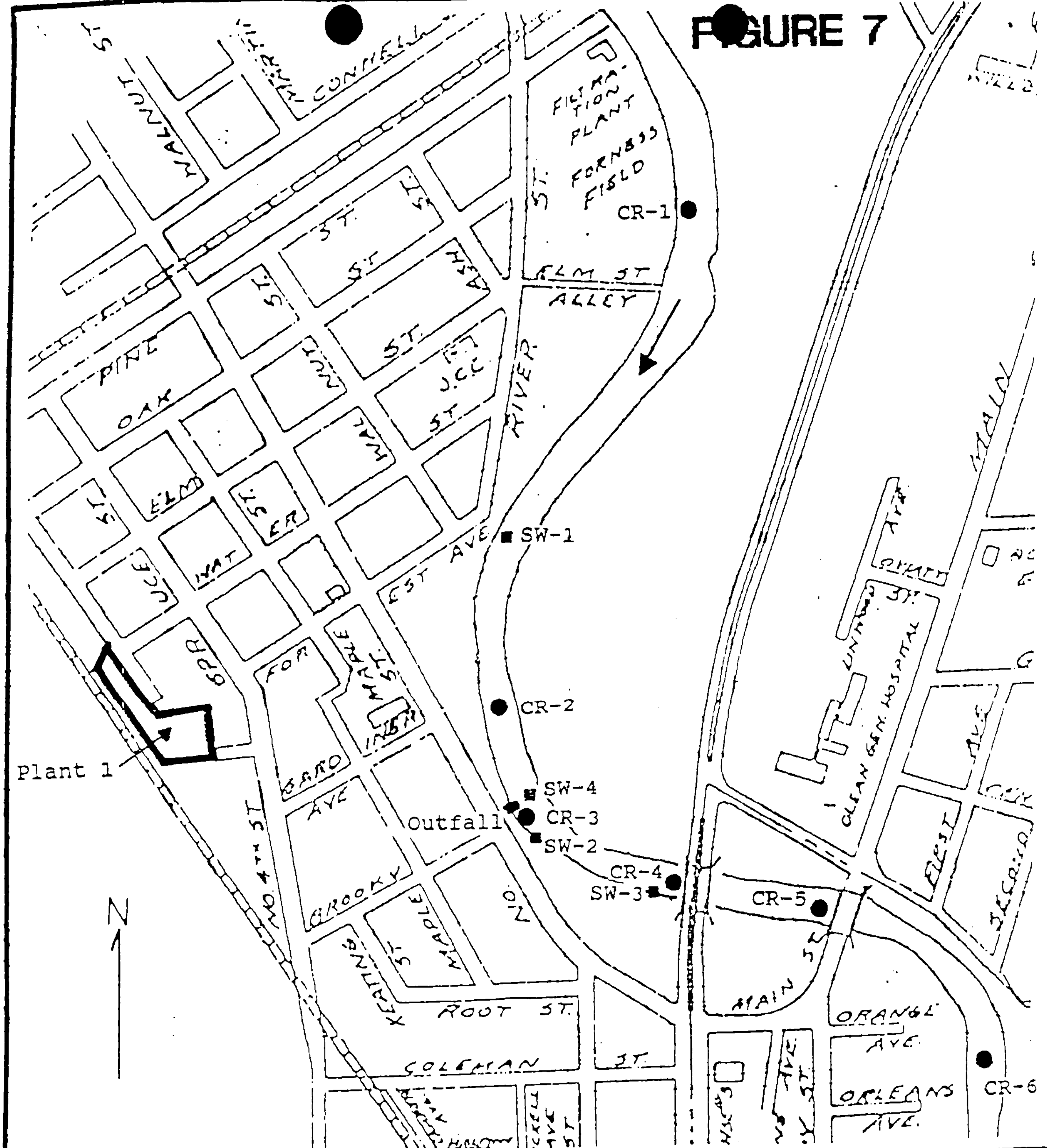
PREPARED FOR
NYSDEC

ERM-Northeast
Environmental Resources Management

SCALE
DATE
FIGURE 2-10

FIGURE 6

146621



PHASE I SAMPLING LOCATION ■
PHASE II SAMPLING LOCATION ●

Note: Duplicate sample CR-7 was also collected at CR-3

TITLE

VAN DER HORST PLANT NO. 1
SURFACE WATER AND SEDIMENT
SAMPLING LOCATIONS IN
OLEAN CREEK

PREPARED FOR

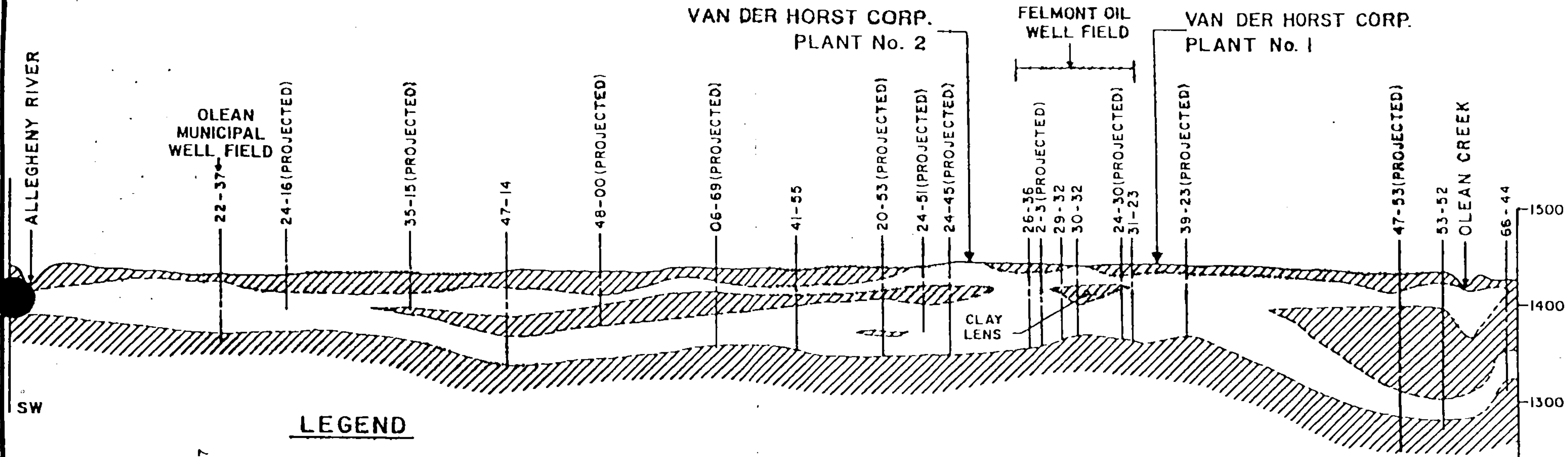
NYSDEC

ERM-Northeast
Environmental Resources Management

SCALE	FIGURE
DATE	2-9

139839

FIGURE 8



LEGEND

22-37 — WELL LOCATION AND NUMBER (LATITUDE AND LONGITUDE)

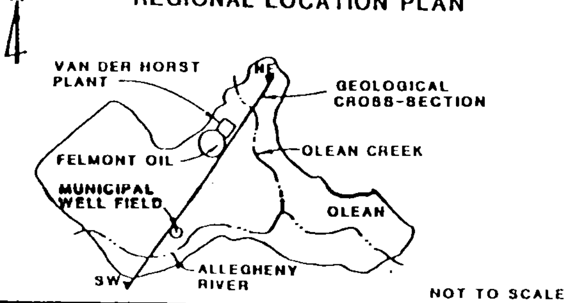
DEPOSITS OF SILTS AND CLAYS (GLACIOLACUSTRINE OR ALLUVIAL)

FLUVIAL DEPOSITS OF SAND AND GRAVEL

NOTE:

GROUND WATER FLOWS FROM THE NORTHEAST TO THE SOUTHWEST. CONSEQUENTLY, THE CLAY LENS BENEATH THE FELMONT OIL FACILITY MUST BE CONSIDERED WHEN INSTALLING DOWNGRADIENT WELLS.

REGIONAL LOCATION PLAN



HORIZONTAL SCALE: 1" = 1,000'
VERTICAL SCALE: 1" = 100'
VERTICAL EXAGGERATION: 10X
(SOURCE: U.S.G.S., 1985)

TITLE
VAN DER HORST RI/FS
GEOLOGICAL CROSS-SECTION

PREPARED FOR
NYSDEC

ERM-Northeast
Environmental Resources Management

SCALE

DATE 12/89

FIGURE 3-3

FIGURE 9

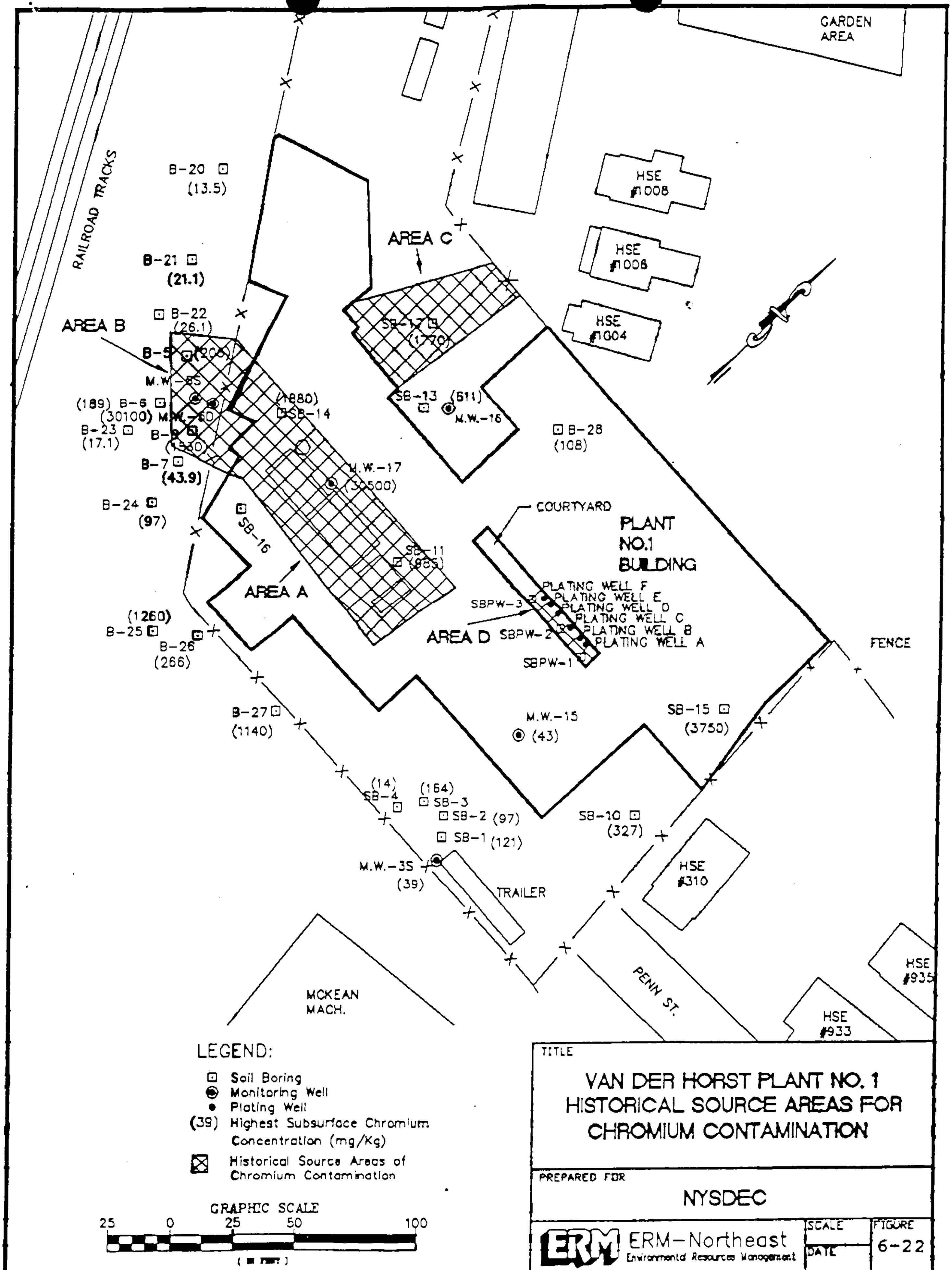

GARDEN AREA
RAILROAD TRACKS
B-20 (13.5)
B-21 (21.1)
B-22 (26.1)
AREA B
AREA C
AREA A
AREA D
HSE #1008
HSE #1006
HSE #1004
SB-17 (1770)
SB-13 (511)
M.W.-16
B-5 (206)
M.W.-6S
(189) B-6 (30100)
M.W.-6D
B-23 (17.1)
B-8 (1530)
B-7 (43.9)
(1880) SB-14
B-28 (108)
M.W.-17 (30500)
B-24 (97)
SB-16
COURTYARD
PLANT NO.1 BUILDING
SB-11 (885)
PLATING WELL F
PLATING WELL E
PLATING WELL D
PLATING WELL C
PLATING WELL B
PLATING WELL A
SBPW-3
SBPW-2
SBPW-1
FENCE
(1260) B-25
B-26 (266)
B-27 (1140)
M.W.-15 (43)
SB-15 (3750)
(14) SB-4
(164) SB-3
SB-2 (97)
SB-1 (121)
SB-10 (327)
M.W.-3S (39)
TRAILER
HSE #310
PENN ST.
MCKEAN MACH.
HSE #935
HSE #933
LEGEND:
Soil Boring
Monitoring Well
Plating Well
(39) Highest Subsurface Chromium Concentration (mg/Kg)
Historical Source Areas of Chromium Contamination
GRAPHIC SCALE
25 0 25 50 100
(IN FEET)
TITLE
VAN DER HORST PLANT NO. 1
HISTORICAL SOURCE AREAS FOR
CHROMIUM CONTAMINATION
PREPARED FOR
NYSDEC
ERM-Northeast
Environmental Resources Management
SCALE
DATE
FIGURE
6-22

TABLE 1

TABLE 5-9

INDICATOR CHEMICALS

Soil	Ground Water	Surface Water
Arsenic	Barium	Chromium
Barium	alpha-BHC	Copper
Cadmium	Cadmium	Vanadium
Chromium	alpha-Chlordane	Zinc
Cyanide	Chromium	
Lead	Copper	
PAHs:	Cyanide	
Benzo(a)anthracene	Lead	
Benzo(a)pyrene	Nickel	
Benzo(b)fluoranthene	Silver	
Benzo(k)fluoranthene	Tetrachloroethylene	
Chrysene	Trichloroethylene	
Fluoranthene		
Phenanthrene		
Pyrene		
PCBs		
Tetrachloroethylene		
Trichloroethylene		

TABLE 2

TABLE 5-31

SUMMARY OF CHEMICALS FOR WHICH INTAKES EXCEED ACCEPTABLE INTAKES

	Noncarcinogenic Effects	Carcinogenic Effects
Current Conditions	o No adverse effects	o Chromium in fugitive dust emissions o Arsenic in residential soils (incidental ingestion by children)
Future Conditions	o Chromium in ground water o Lead in ground water	o Chromium in fugitive dust emissions o Arsenic in residential soils (incidental ingestion by children) o Tetrachloroethene in ground water used for drinking water